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From the Editor

The lead article in this issue of the *Journal of Postsecondary Education and Disability* examined disability stigma on campus and how to help students with psychiatric disabilities be successful. The authors, **Daniel Trunk** (Beavercreek City Schools), **Charles Russo** (University of Dayton), and **Jack Trammell** (Mount Saint Mary's University), used previous research reports that college students with disabilities, in particular those with psychiatric conditions, experience unique disability-related barriers impacting their social and academic experiences and degree completion. The results of the analyses revealed that students with psychiatric disabilities reported significantly higher stigma scores compared to peers with other types of disabilities on the Postsecondary Student Survey of Disability-Related Stigma. In the next article, **Grace Francis, Jodi Duke** (George Mason University), and **Laura Siko** (Northern Virginia Community College) provided a conceptual framework for supporting well-being among college students with disabilities. These authors described current policies and practices that influence well-being among college students with disabilities; reviewed existing theories, models, and frameworks related to well-being among college students with disabilities; introduced *Be Ready, Be Well*, a conceptual framework that integrates key components of existing policies, practices, theories, models, and frameworks to support well-being among college students with disabilities; and provided implications for higher education professionals.

In the third article, the effect of peer mentoring on achievement for college students with disabilities is demonstrated. **Allison Lombardi** (University of Connecticut), **Graham Rifembark** (Kansas University), **Jessica Monahan** (University of Delaware), **Emily Tarconish** (University of Connecticut), and **Christopher Rhoads** (University of Connecticut) used quantitative methods to examine the effect of peer mentoring on academic probation status and grade point average. While there were no significant differences between the intervention and comparison groups for either outcome, implications for higher education researchers and practitioners were provided, including suggestions to collect various types of non-academic data (e.g., satisfaction, well-being, self-determination surveys) and to examine structural factors of the program (e.g., mentor-mentee relationships, mentor training) in order to better understand the possible benefits of peer mentor programs. In the next article, **Amber O'Shea** (Pennsylvania State

University) and **Mark Salzer** (Temple University) researched autonomy supportive classrooms and well-being in college students with psychiatric disabilities. They found that increases in perceived autonomy support in the classroom predicted higher levels of quality of life and recovery, and lower levels of distress from psychiatric symptoms.

In the fifth article, the STEM climate for queer students with disabilities was examined. **Ryan Miller** and **Megan Downey** (University of North Carolina at Charlotte) offered a holistic portrayal of students' higher education experiences and of their multiple identities. The authors also presented ways that faculty and staff may seek to improve the classroom and overall campus environment for students. In the next article, **Beth Fornauf** and **Joy Dangora Erickson** (University of New Hampshire) provided a literature review on an inclusive pedagogy through universal design for learning in higher education. This review extends the work of previous research by focusing solely on universal design for learning, and suggests that it has implications for its use in advancing inclusive pedagogy and in disrupting a discourse of normalcy in postsecondary settings.

This issue concludes with a practice brief on virtual self-advocacy training development for freshmen students with a documented learning difference. **Morgan Russell** and **Denise Pearl** (Maryville University) provided information about an innovative program to help address the challenges students encounter while navigating the postsecondary disability accommodation process to gain access to appropriate academic accommodations needed for degree completion.

The editorial team and review boards associated with the *Journal of Postsecondary Education and Disability* are pleased to provide this issue to enable college student disability educators, and disability studies researchers, with data and effective practices that help college students with disabilities be successful in their chosen colleges and universities.

Roger D. Wessel, Ph.D.
Executive Editor

Disability Stigma on Campuses: Helping Students with Psychiatric Impairments to Succeed

Daniel J. Trunk¹
Charles J. Russo²
Jack Trammell³

Abstract

This study investigated the impact of disability type on perceived disability-related stigma of 55 students with disabilities at a medium-sized, private mid-western university, as measured by the Postsecondary Student Survey of Disability-Related Stigma (PSSDS). The researchers conducted five independent samples *t*-tests to determine if there were significant differences in perceived stigma scores between students with psychiatric impairments compared to those with other types of impairments. Previous research reports that college students with impairments, in particular those with psychiatric conditions, experience unique disability-related barriers impacting their social and academic experiences and degree completion. The results of the analyses revealed that students with psychiatric impairments reported significantly higher stigma scores compared to peers with other types of impairments on the Academic Success, Personal Relationships, and Sense of Self and Identity factors of the PSSDS, as well as on the overall stigma scores. The article also discusses implications for further research.

Keywords: disability stigma, psychiatric impairment, mental health stigma, college students with disabilities

Studies conducted over the past 20 years demonstrate a trending increase in students with disabilities pursuing postsecondary study. For example, admissions data collected by Palombi (2000) suggested that the number of students with disabilities attending college has grown significantly in recent years, with an estimated 400% increase between the mid-1970s and the turn of the 21st century. Data from the National Center for Education Statistics (2010) reported that slightly less than 11% of undergraduate students reported having a disability during the 2007-2008 school year. Similarly, a follow-up study conducted by the National Center for Education Statistics (2015) revealed slightly over 11% of students in U.S. postsecondary institutions were identified as having disabilities during the 2011-2012 academic school year. Although exact admissions data and future projections for students with disabilities pursuing higher education are difficult to calculate, it is evident that these numbers continue to increase (Leake, 2015; Sniatecki et al., 2015).

Despite this increase in admission and attendance, individuals with disabilities in the United States are

still significantly less likely to attend college or to graduate with degrees compared to their peers not having disabilities (Marshak et al., 2010; Newman et al., 2010). Within the subpopulation of students with disabilities, those with psychiatric disorders or impairments, the focal point of this study, are a particular subgroup with unique needs and challenges that may not be fully met on many campuses.

Researchers have found that students with disabilities are less likely to seek accommodations through offices of disabilities services or other student support offices when they perceive greater levels of environmental stigma (e.g., Belch, 2011; Denhart, 2008; Hartley, 2010; Kranke et al., 2013; Litner et al., 2005; Salzer et al., 2008; Weiner & Weiner, 1996). Yet, there is a lack of research focusing on the perceived stigma of students with psychiatric disabilities compared to their peers with other types of disabilities.

As noted, students with psychiatric disabilities tend to have lower retention and graduation rates compared to students with other types of disabilities, as well as their peers who do not have disabilities. Perceived stigma on campus related to mental

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health disorders may cause students with psychiatric disabilities to choose to refrain from disclosing their disabilities to those on campus who may be able to help them to procure the accommodations they may be legally entitled to receive.

This study was situated within a legal and equal opportunity framework with a particular emphasis on community inclusion and accommodation of students in higher education with psychiatric impairments. The purpose of the study, which was originally part of a larger study, was to investigate the impact of disability type on student perceived disability stigma. This study compared disability stigma ratings between students with psychiatric disabilities and those with other types of disabilities, such as learning disabilities and attention-deficit/hyperactivity disorder. By comparing the perceived stigma of students with psychiatric disabilities to their peers with other types of disabilities, the research aimed to provide evidence for the need for a cultural shift away from a completely medical model of “mental illness” towards a more accepting campus community supportive of mental health awareness and disability accommodation.

Literature Review

Prior to entering postsecondary educational settings, students with disabilities are protected by the Individuals with Disabilities Education Act (IDEA, 2004). The IDEA requires all 50 states, because all states currently accept federal IDEA funding, through local education agencies or school boards, to provide a free appropriate public education (FAPE) to all identified students with disabilities in the least restrictive environment, including those with psychological and psychiatric impairments and disorders.

In higher education settings, students with psychiatric disorders are responsible for maintaining the same academic and behavioral standards as their peers who are not disabled. Also, students with disabilities on campuses are responsible to seek out services and support in the form of accommodations from the college or university office of disability services or therapeutic services through counseling centers (Wisbey & Kalivoda, 2011). Unlike in K-12 setting, officials in higher educational institutions are not obligated to identify and evaluate students who may have or demonstrate symptoms of psychiatric impairments. Consequently, many individuals with mental health needs often do not get the support and services they may need in order to be successful, a reality which may contribute to lower retention rates (Lightner et al., 2012).

Two other federal statutes impacting the disabled, Section 504 of the Rehabilitation Act of 1973 (Sec-

tion 504) and ADA do not mandate the delivery or provision of specific services such as mental health support, as opposed to accommodations. Still, these laws do help create a framework for better meeting the needs of students with mental health needs. Even though Section 504 and the ADA are intended to prevent discrimination, studies (e.g., Russo & Osborne, 2009; Collins & Mowbray, 2005; McEwan & Downie, 2013; Salzer et al., 2008) demonstrate that students with psychiatric disabilities often do not seek the accommodations to which they may be entitled, thereby possibly leading to lower degree completion rates and greater future economic disadvantage.

Marshak et al. (2010) investigated barriers for students with disabilities contributing to their not seeking out and utilizing disability services at their higher education institutions. This study revealed that disability stigma, the students’ desire for self-advocacy and self-sufficiency, their lack of knowledge about their disabilities, a lack of quality services delivered despite requests, and negative disability-related experiences with faculty and school personnel were all reasons participants chose to not disclose their disabilities to campus personnel or seek out accommodations. The financial cost of private psychological evaluations to demonstrate evidence of disabilities, if college and university programs do not provide them, may also deter students on campuses from applying for accommodations (Wisbey & Kalivoda, 2011).

Lightner et al. (2012) uncovered similar results in their analysis including 42 students with learning disabilities at a large competitive state university. Data gathered through individual interviews revealed four main themes that contributed to students not seeking accommodations on campuses after being on Individualized Education Programs (IEPs) while in K-12 schools. The themes included a lack of time students reported to seek out assistance through offices of disability services; lack of knowledge about their own disabilities and how to seek help; the want or perceived need to establish identities separate from being considered “students with disabilities;” and feelings that because things were going well they did not necessarily need the extra support.

Baker et al. (2012) investigated the perceptions of students and faculty at a small, liberal arts women’s college regarding students with disabilities. The results of this study highlighted the existence of a discrepancy in the views of inclusiveness for students with disabilities on campus between faculty and students at the university. The study further reported that faculty members tended to view the campus and classrooms as more inclusive and supportive while students reported lower ratings relat-

ing to the inclusiveness and support for those with disabilities on campus. The study added that faculty members reported lower mean ratings compared to students on questions about the capabilities of students with disabilities in meeting the demands of academic programs, as well as demands of the profession post-graduation.

Among all students with disabilities in higher education, those with psychiatric impairments, the focus of this study, represent a growing population. According to the most recent data from the National Center for Education Statistics (2015), approximately 20% of the population of students with disabilities, or about 2% of the total student population, on campus reported having a psychiatric disability during the 2011-2012 school year.

Statistics from the Higher Education Research Institution (2011) estimated approximately 4% of undergraduate students in 2010 reported having psychological disorders. Because of the pattern of many students with disabilities not disclosing their disabilities to peers or professionals at their schools, it is difficult to estimate a valid number of individuals with psychiatric disabilities in United States higher education systems (Collins & Mowbray, 2008; Stein, 2013). Despite this, the number of students with such impairments appears to be sizable and growing.

Undiagnosed and untreated psychiatric disabilities may mean that many college and university students are left to struggle with symptoms of disorders such as depression, anxiety, and schizophrenia without the care and support of qualified university and mental health professionals. Moreover, although studies reveal an increase in the pursuit of postsecondary study, approximately 85% of students with psychiatric disabilities withdraw from college prior to completing their degrees (Kessler et al., 1995).

Hartley (2010) described four risk factors for retention relating specifically to students with mental or psychiatric disabilities in college: temporary cognitive impairment, pervasive social stigma, poor academic self-confidence, and conflicted peer relationships. The social stigma associated with mental health diagnoses also makes students reluctant to disclose their disability to faculty members or peers. The "invisibility" of mental health disorders can also lead to having faculty members question whether poor performances are due to actual disabilities or if they are a result of low motivation or knowledge. Souma et al. (2012) observed that students with psychiatric disabilities might experience disability-related limitations that may negatively impact their educational and social-emotional functioning.

Difficulties associated with "invisible" mental health disorders may include the side effects of medications; difficulty concentrating and sustaining attention as well as maintaining stamina or vitality; trouble adapting to changes in schedules or living situations, severe anxiety related to tests and group assignments; difficulty interacting or maintaining relationships with others; and higher rates of drug and alcohol abuse (Belch, 2011; Hartley, 2010; Stein, 2013; Wolf, 2001). Given that the college experience may be the first time students with psychiatric impairments are away from supports they may have had in the past, such as family, close friends, and previous therapists, these new living and learning arrangements may be a source of significant stress. Further, the academic rigor required to complete college and university courses may be more than what students experienced in their secondary school careers.

Megivern, Pellerito, and Mowbray (2003) found that the most common reasons students with psychiatric disability withdraw from their colleges and universities were psychiatric symptomology such as anxiety, feelings of isolation, lack of academic integration, financial problems, and changed life goals. The authors also reported that although aware of their psychiatric impairment and its symptoms, 90% of students did not seek assistance from their campus offices of disability services or counseling centers.

Kranke et al. (2013) concluded students tended not to disclose their disabilities to anyone on campus for reasons including the stigma associated with mental health disorders, fears of not being considered "normal," concerns for how they would be viewed by their professors and how this could affect future relationships with professors, and the need to feel independent such as not feeling as though the disability would/should affect their academic performance. The researchers suggested that students were more likely to disclose their disabilities when they perceived their instructors as supportive, when they experienced a "stress overload," or when their disabilities had a significant impact on their academic performance, such as a student having to miss class for a week due to symptoms of their disability. The authors noted that students with psychiatric disabilities on campuses may struggle more significantly with internal stressors compared to their peers who are not disabled.

Previous research on students with disabilities has demonstrated that the perception of disability stigma remains a common reason why these individuals choose not to disclose their conditions to staff or faculty on campuses nor request accommodations for their disabilities through an office of disability services. According to Dovidio, Major, and Crocker

(2000), stigmatization involved both the recognition of individual differences or deviations from the norm based on some distinguishing or specific characteristics and, consequentially, devaluations of the persons due to this characteristic. These authors added that most potentially stigmatizing conditions, although not detrimental to one's health in-and-of-themselves, can potentially threaten the stigmatized individuals' psychological health due to associated social isolation and rejection. While students with psychiatric disabilities may be considered to have hidden stigmatizing characteristics not readily visible to others, the suppression of their concealable stigmas may, in fact, bring about greater levels of stress and psychological incapacitation compared to peers with readily visible stigmas (Smart & Wegner, 2000).

In sum, although the rates of individuals with psychiatric disabilities pursuing higher education are increasing, these students continue to face challenges contributing to low retention rates and negative experiences on campus. In general, students with psychiatric disabilities may be the least understood subgroup on campus, contributing to a significant lack of academic and emotional support and to their continued marginalization (Megivern et al., 2003; Mitchell et al., 2013). Due, at least in part, to perception regarding mental health disorders, students with psychiatric disabilities often do not disclose their disabilities to peers, faculty members, or other school personnel. In turn, these students may not receive accommodations they may be legally entitled to under Section 504 and the ADA.

The following research question guided this study on perceived disability stigma in students with psychiatric disabilities in higher education: What are the differences in perceived disability-related stigma between students with psychiatric impairments compared to peers with other types of impairments?

Method

Setting

The researchers conducted the study at a private, four-year research university in the Midwestern United States. Blair University (BU; pseudonym) has an undergraduate enrollment of approximately 10,000 undergraduate students, with approximately and additional 3,000 graduate and professional students. Specific university characteristics and demographic data are not described in detail to protect the confidentiality of the protected group being studied as well as the reputation of the institution.

Sample

The population for the study was all undergraduate students with psychiatric disabilities at BU. Given the confidential nature of student disability status, especially considering the stigma associated with psychiatric disabilities in particular, the study included a sample of students at BU who volunteered to participate. Thus, the research employed a nonprobability, purposive sampling method that allowed participants to volunteer to participate in the study. A total of 57 questionnaires were completed during the data collection process, resulting in 55 usable surveys; two of the surveys were completed by graduate students who may have inadvertently been sent the solicitation for research e-mail and were not usable given the research questions and instruments being used.

Variables

The demographic items and research variables included on the questionnaire used in the study were included not only to allow for the intended statistical analyses, but also to provide descriptive statistics related to demographic characteristics and service utilization of students with both psychiatric and other impairments at the target institution. The disability stigma variable referred to each individual student's disability-related stigma scores on the PSSDS, while the disability type variable referred to the type of disabilities with which the students completing the questionnaire had been diagnosed. The eleven disability categories in this study were consistent with those used in the National Postsecondary Student Aid Survey and in previous research (Herrick, 2011). For the purposes of this study, the disability type variable was recoded into a dichotomous, categorical variable allowing for a two-group comparison between students with psychiatric disabilities and students with all other types of disabilities.

Instrumentation

Postsecondary Student Survey of Disability-Related Stigma (PSSDS). The PSSDS, created as a dissertation project (Trammell, 2006), is an instrument used to measure perceived disability stigma experienced by individuals with disabilities on college campuses. Trammell explained that the PSSDS was designed under the assumption that numerous factors or sources contribute to the effects of disability stigma. The instrument, which uses a Likert-type scale rating system, is comprised of 24 questions relating to four identified factors related to students' perceived disability stigma: academic success, peer relationships, sense of self and identity, and global awareness.

The PSSDS' Academic Success domain was designed to measure a student's perceptions of his or her own academic abilities and achievements as a student with a disability. The Personal Relationships domain was designed to measure a student's perceptions of how disability and stigma impacted their personal relationships, particularly in ways that might be categorized as negative or discriminatory. The Sense of Self and Identity domain was designed to measure students' self-awareness of their own disabilities, the degree to which they accept their conditions, and their ability to live with them.

The Global Awareness domain was designed to go beyond the sense of self as an attempt to measure students' general acceptances of their disability identities and the extent to which they impacted skills such as self-advocacy, communication, and academic capital. Six of the 24 items on the PSSDS uniquely load into one of each of the four stigma factors measured on the instrument. For example, the academic success factor score is derived from a summation of responses on questions 11, 12, 13, 18, 22, and 23 on the PSSDS.

Individuals completing the PSSDS are asked to respond to each question on the scale by selecting a response from those provided on the five-point scale that most accurately represents their experiences on campus (0 = never, 1 = occasionally, 2 = regularly, 3 = frequently, 4 = all of the time). According to Trammell, "the higher the total score ... the more stigmatized a student felt" (2006, p. 16). Overall stigma scores are derived from a summation of the four unique stigma factors, each having a potential score from 0-24. The overall disability-related stigma scores have the potential to range from 0 to 96, with the latter representing the highest degree of perceived stigma. Trammell provided the following scale to categorize overall stigma scores: 0 – 24 little stigmatization, 25 – 48 moderate stigmatization, 49 – 72 high stigmatization, and 73 – 96 extremely high stigmatization.

Procedures

After gaining approval from the university Institutional Review Board (IRB), as well as establishing a contact in the office of disability services, the researchers sent the research questionnaire to all students registered with disability services at BU during spring of 2016. The instrument was sent to students who were second year students through seniors six times during the course of the data collection period, and not sent to first year students because they had not begun school yet during the initial sending of the questionnaire. Given the confidential nature of student disability status, the researchers worked through

our contact in the office of disability services to send the questionnaire to possible participants.

Data Analysis

In order to determine whether there was a significant difference in disability stigma ratings reported by students with psychiatric disabilities compared to their peers with other types of disabilities, the researchers conducted a series of independent samples *t*-tests. This type of analysis is useful when comparing mean scores between two groups to determine if statistically significant differences exist on a measured dependent variable (Ary, Jacobs, & Sorensen, 2010). The mean factor scores for the four PSSDS factors and total stigma scores on the PSSDS were compared between students with psychiatric disabilities and students with all other disability types. The alpha level was initially set at .05 for each independent samples *t*-test. However, given the increase in familywise error rate associated with testing multiple hypotheses, the researchers adjusted the alpha level for each test to .025 using the Bonferroni correction (Field, 2009; Pallant, 2013).

Results

The researchers provided a staff member from the office of disability services with the Qualtrics-created survey link; that staff member then sent an email to the 631 potential participants containing an invitation to participate in the research, as well as the link to the questionnaire. The researchers also placed paper copies of the survey in the office of disability services. Fifty-five students completed the electronic version of the research instrument. No completed paper copies of the survey were received.

Demographics

Disability Type. On the primary disability type item of the questionnaire, 25 participants reported having psychiatric disabilities (45.5%), 13 (23.6%) responded as having attention-deficit/hyperactivity disorder (ADHD), 10 indicated that they had learning disabilities (18.2%), and 3 identified themselves as having health impairments (5.5%). Two (3.6%) students reported having hearing impairments while another two (3.6%) students responded that they had orthopedic impairments. For the purposes of hypothesis testing, 25 students (45.5%) were placed in the psychiatric disability group while 30 (54.5%) were put in the "other" disability type group.

Co-occurring Disability Types. On the research instrument, participants reported whether they had a secondary impairment in addition to the primary

impairments they reported. Eighteen (32.7%) participants reported having co-occurring, or dual, disabilities. The two most common co-occurring pair of impairments reported by the participants were psychiatric impairments and ADHD, with seven individuals having reported these dual diagnoses. Three participants reported having psychiatric disabilities and health impairments. Other co-occurring disabilities reported included dual: psychiatric and specific learning disabilities, dual psychiatric disabilities, psychiatric and orthopedic disabilities, ADHD and specific learning disabilities, visual and health impairments, and developmental disability and ADHD. For the purpose of this study, students were placed into a disability group (i.e., psychiatric or other) by their primary reported disability on the study instrument.

Engagement in Counseling Services. Of the 55 participants who completed the research questionnaire, 22 (40%) reported that they received counseling services while 33 (60%) answered that they did not receive counseling services. Of the 22 students who received counseling services, 14 (63.6%) reported that they received this help through the university counseling center at BU, while 8 (36.4%) responded that they obtained assistance from outside service providers.

Previous Disability-Related Services. Students were asked to report whether they received services or accommodations by means of IEPs and/or Section 504 Plans in high school due to their disabilities or whether they did not receive services through either of these documents. Thirteen (23.6%) of the 55 participants reported they received IEP services while 13 (23.6%) responded that they received services through Section 504 Plans. Twenty-nine (52.7%) participants reported that they did not receive services or accommodations in high school due to their disabilities. The study did not take into account, for those who had received prior services and accommodations, when the students were initially identified as having impairments.

Stigma by Disability Type

The research question asked what the differences in perceived disability-related stigma ratings were between students with psychiatric impairments compared to their peers with other types of impairments across the four factors of the PSSDS, as well as the total PSSDS stigma score. In order to investigate this question, the researchers conducted five separate independent samples non-directional *t*-tests using a Bonferroni corrected alpha level of .025. Significant *t*-test results revealed statistically significant differences in mean scores between the two groups, while

the effect size statistic indicates the magnitude of the impact of disability type on stigma scores. Levene's Test for Equality of Variances was nonsignificant for all *t*-test analysis, except for the Personal Relationships factor analysis.

The results of the Academic Success factor *t*-test demonstrated a statistically significant ($t(53) = 3.25, p = .002$) difference in Academic Success factor scores between students with psychiatric impairments compared to students with other types of impairments. More specifically, students with psychiatric impairments reported significantly higher Academic Success factor scores ($M = 12.68, SD = 4.00$) on the instrument compared to those with other types of impairments ($M = 9.47, SD = 3.35$). The effect size, calculated using Cohen's *d*, of .87 indicates a large effect.

The results of the Personal Relationships factor *t*-test indicated a statistically significant ($t(36.16) = 2.85, p = .007$) difference in Personal Relationship factor scores between students with psychiatric impairments and those with other types of impairments. More specifically, students with psychiatric impairments reported significantly higher Personal Relationship factor scores ($M = 10.76, SD = 4.78$) on the instrument compared to students with other types of impairments ($M = 7.70, SD = 2.68$). The effect size, calculated using Cohen's *d*, of .79 indicates a medium effect.

The results of the Sense of Self and Identity factor *t*-test revealed a statistically significant ($t(53) = 2.45, p = .018$) difference in Sense of Self factor scores between students with psychiatric impairments compared to those with other types of impairments. More specifically, students with psychiatric impairments reported significantly higher Sense of Self factor scores ($M = 11.80, SD = 3.55$) on the instrument compared to those with other types of impairments ($M = 9.47, SD = 3.49$). The effect size, calculated using Cohen's *d*, of .66 indicates a medium effect.

The results of the Global Awareness factor *t*-test demonstrated no significant ($t(53) = 1.42, p = .160$) differences in Global Awareness factor scores between students with psychiatric impairments and those with other types of impairments. The mean scores on the Global Awareness factor of the PSSDS for students with psychiatric impairments ($M = 10.24, SD = 4.25$) did not differ significantly from those in the study with other types of impairments ($M = 8.63, SD = 4.10$).

The researchers conducted the final independent samples *t*-test to compare the PSSDS total disability-related stigma factor scores between students with psychiatric impairments to those with other types

of impairments. The results of the *t*-test indicated a statistically significant ($t(53) = 3.16, p = .003$) difference in PSSDS total scores between students with psychiatric impairments and students with other types of impairments. Among the students in the sample, those with psychiatric impairments reported significantly higher PSSDS total scores ($M = 45.48, SD = 13.81$) on the instrument compared to students with other types of impairments ($M = 35.27, SD = 10.11$). The effect size, calculated using Cohen's *d*, of .84 reveals a large effect of disability type on perceived disability-related stigma as students with psychiatric impairments reported significantly greater levels of stigma.

Discussion

This study expanded previous research on students with disabilities in higher education by focusing on individuals with psychiatric disabilities. From an equal access and opportunity lens, this study investigated the impact of disability type on student perceived disability stigma. In general, the results of the study supported the research hypothesis, which stated there would be significant differences in perceived disability-related stigma between students with psychiatric impairments compared to those with other impairments.

Insofar as the researchers sent the research questionnaire to students who had self-disclosed their disabilities on campus, all of the respondents in the sample were registered as having impairments through the university office of disability services. Despite this, only 46 of the 55 (83.6%) participants reported receiving academic accommodations. Of the nine students who did not receive accommodations, seven identified as having psychiatric impairments.

The research results suggest three conclusions from this finding. First, it is possible that the responding students with psychiatric impairments did not need academic accommodations because their disabilities may not have impacted their educational performances to the point where they needed such assistance in order to access the curricula in accordance with Section 504.

Second, it is possible that previous negative experiences with faculty and college or university officials, or factors such as stigma related to mental illness, prevented the students from requesting and/or using accommodations. Stein (2013) reported that mental illness stigma alone may prevent students with psychiatric impairments from requesting accommodations. To this end, a study by McLean and Andrews (1999) found that nearly two-thirds of students diagnosed with psychiatric impairments re-

gretted disclosing their disabilities on campuses due to negative consequences of doing so and would not recommend others disclose theirs. It is possible, then, that although participants in this study were eligible to receive accommodations, they did not use them due to reasons such as stigma.

Third, as Wiener and Wiener (1990) reported, students with psychiatric impairments may not have felt entitled to or deserving of academic accommodations. In this respect, participants may have thought that because their psychiatric impairments should not have impacted their academic performances, they chose not to request accommodations. Regardless of the reasons, the lack of utilization of potentially legally-mandated accommodations may impact student success.

Unexpectedly, despite reporting having psychiatric impairments, only 10 of the 25 responding students reported utilizing assistance through the counseling center at BU while another 5 reported receiving help through outside service providers. These findings are similar to those reported by Belch (2011) and Cooper et al. (2003), who also identified the underutilization of counseling services by students with psychiatric impairments.

Finally, approximately one-half of the participants ($n = 26$) in the study reported receiving services and/or accommodations due to their disabilities in high school. Of the students with psychiatric disabilities, only two reported having IEPs in high school, while six answered that they received accommodations through 504 Plans. Seventeen students with psychiatric impairments reported receiving no prior services. Comparatively, of the 30 participants with other types of disabilities, 18 received services in high school.

It is possible that the onset of the psychiatric impairments did not occur until the students entered higher education. Even so, it is also possible that students' impairments were not properly identified in K-12 settings. Given the importance of collaborative transition planning for students with impairments moving from K-12 to higher education settings (Madaus, Shaw, & Dukes, 2010), this under-identification may contribute to students with these impairments being unprepared for the challenges they may face in college.

Stigma by Disability Type. The results of this study demonstrated that the 55 participating students with disabilities obtained a mean total PSSDS score of 39.91, thereby placing them in the "moderate stigmatization" range. In other words, this reveals that, as a whole, there seemed to be a moderate amount of stigma on campus experienced by the participants related to their disabilities. Again, given the limited

number of responses and the potential for nonresponse bias, it is difficult to generalize these findings to the larger population of students with disabilities at BU. It is certainly possible that students registered with disability services who chose not to complete the research questionnaire may experience more stigma than those who chose to participate. Further, it may be even more likely that students with impairments who have not chosen to disclose their disabilities on campus experience the greatest amounts of perceived stigma. However, these are simply speculations and cannot be supported by any other information obtained in the study.

The results of the group comparison analyses revealed that respondents with psychiatric impairments, in general, reported greater levels of stigmatization on campus. The *t*-tests conducted for this study found that, in support of the research hypotheses, these students reported significantly higher stigma scores in three of the four PSSDS stigma factors, as well as in overall stigma scores compared to those with other types of disabilities.

Respondents in this study with psychiatric impairments reported higher stigmatization ratings on questions that loaded into the Academic Success factor. In fact, of the four factors on the PSSDS, students with psychiatric impairments reported the highest levels of stigmatization related to academic success. This factor, which includes items such as “My grades are lower than expected” and “I do poorly on tests in part due to my disability,” reflects students’ perceptions of their own academic performance and their need for accommodations in order to be successful in college.

This is a noteworthy finding considering that 13 of the students in the “other disability” group indicated having learning disabilities, a diagnosis characterized by significant deficits in at least one academic area. This reveals that although the psychiatric impairment may not be directly impacting students’ academic skills, they reported greater perceived deficits in such areas compared to those with diagnosed academic deficits. Hartley (2010) described poor academic self-confidence as a barrier for students with psychiatric impairments in college. The results of this study confirmed this outcome, expanding on it through further comparison to those with other types of disabilities.

Another finding of this study was that students with psychiatric impairments reported significantly higher levels of perceived stigma with regard to peer and interpersonal relationships. Social integration, which involves the development of interpersonal relationships with peers and faculty members as well as feeling a sense of belonging on campus, is important

to student success and persistence in college (Bialka, Morro, Brown, & Hannah, 2017; Tinto, 1993).

The results of this study reveal that, compared to those with other types of disabilities, students with psychiatric impairments reported greater perceived impact on disability stigmatization on their interpersonal relationships. Because students with disabilities, in general, may demonstrate lower levels of social integration (DaDeppo, 2009), this finding suggests that students with psychiatric disabilities at BU may be particularly at-risk socially and that campus officials should undertake targeted efforts to help these students develop interpersonally and help them build social networks on their campuses.

Finally, the results of the study supported the research hypothesis that students with psychiatric disabilities would report significantly greater levels of perceived disability stigma related to their sense of self. This finding is not surprising because many common psychiatric conditions are characterized by persistent depressed moods, low self-esteem, and decreased self-concept, not to mention considerable mental health stigma in the broader culture.

On the PSSDS, students with psychiatric impairments reported higher levels of stigmatization on items including “I think of myself as smart,” “Teachers view me as having a shortcoming,” and “I feel good about myself.” This factor is of particular importance as studies (e.g., Baker et al., 2012; Kranke et al., 2013; Thompson-Ebanks, 2011; Weiner & Weiner, 1996) have shown students are less likely to disclose their disabilities and ask for accommodations when they perceive faculty members as resistant to accommodation or when they feel faculty members have negative views towards disabilities. Conversely, Kranke et al. (2013) indicated that students who feel faculty members are supportive are more likely to disclose their disabilities and ask for accommodations.

Students with psychiatric impairments reported higher stigma scores on items comprising the Global Awareness factor compared to those with other types of disabilities. The differences were not significant, though.

Recommendations for Future Research

Insofar as this study was conducted at a mid-sized private institution, replication of this study at larger public and private institutions may provide insights into the disability-related stigmatization perceived by students with impairments at other types of colleges and universities. Future qualitative studies should also be conducted to better understand the unique experiences of students with psychiatric impairments on campuses and how their impairments impact their

ability to function within these three areas. Phenomenological qualitative designs using interview techniques, such as those described by Seidman (2013), may allow researchers to gain more holistic understandings of the meaning making processes of students with psychiatric impairments on campus and how these conditions impact their lives.

Of particular surprise was that only 15 of the 25 students with psychiatric impairments in the study received any sort of counseling services, with only 10 of them utilizing those offered through the university. Further quantitative research investigating the impact of counseling services on students with psychiatric impairments may help emphasize the potential academic and social benefits of participation in counseling services. Utilizing qualitative methodologies, researchers may also be able to gain better understanding of why students with psychiatric impairments, who in this study disclosed their disabilities on their campuses, do not take advantage of mental health services offered through the university.

Real or perceived faculty stigmatization toward disabilities can be a main factor in students choosing not to disclose their impairments on campus (Martin, 2010). As such, research is needed from a faculty development perspective to explore faculty perceptions of students with psychiatric disabilities and to help faculty members gain awareness of these potentially unconscious biases and beliefs. Further, it may be prudent to investigate faculty and staff knowledge of laws offering protections for students with disabilities such as Section 504 and the ADA. Data gathered through these investigations may be used to create professional development opportunities to help faculty members gain awareness of potentially unconscious biases and beliefs, as well as to help them better understand nondiscrimination laws and institutional responsibilities.

Finally, it would be useful to conduct future research to better understand the experiences and needs of graduate students with disabilities. Because two graduate students volunteered for participation in the current study, and given increasing rates of graduate student enrollment for students with impairments (NCES, 2009), it may be reasonable to engage in post hoc studies to explore how these students successfully navigated their undergraduate studies and earned their degrees. Further, exploring factors associated with these students' successes, as well as barriers they faced as undergraduates, coupled with an examination of challenges they may continue to face in their graduate education, are also likely to have important implications for student and academic affairs professionals as they seek to create more inclusive environments designed to foster student success on campuses.

Recommendations for Future Practice

Culture Change. The results of the study reveal that campus culture related to individuals with disabilities, especially those with psychiatric impairments, may be less than fully inclusive. At the heart of organizational culture are the underlying values and beliefs of individuals within the organization. For example, although faculty members may have statements on their syllabi noting that students with impairments may receive accommodations and may say and espouse that they support students with impairments, if the true beliefs of those educators are that students with impairments get unfair advantages or that they lack the same academic capabilities as their peers who do not have disabilities, then the organizational culture remains negative. Regardless of the artifacts supporting the rights of individuals with disabilities and the espoused or spoken values of campus officials claiming nondiscrimination, this study indicated that the underlying values on campus continue to stigmatize disability as perceived by the students.

Moreover, underlying cultural viewpoints of psychiatric impairments from a medical model perspective may lead to the assumption that conditions such as generalized anxiety disorder or major depressive disorder are illnesses that can, and should, be "cured." Although medical intervention such as pharmaceutical interventions may certainly be appropriate in some cases, students may be less likely to discuss or seek treatment for such conditions if they feel they will be judged or seen as having something wrong with them. Instead, a cultural shift away from this view of "mental illness" towards a more open and accepting campus community that supports mental health awareness and disability accommodation may help students feel more supported and willing to talk about challenges they may be facing related to their mental health.

Another recommendation for change is the practice of universal instructional design (UID) as an example of positive campus culture related to students with disabilities. UID fosters multimodal teaching and assessment methods in order to enhance learning for all students by creating a learning environment that encourages different strengths and learning styles (Wisbey & Kalivoda, 2011). Opposed to simply providing accommodations to persons with disabilities, UID maintains that students should have the freedom to demonstrate growth and mastery using many different methods and that it should be a priority of the faculty members to support student discussion and cooperative learning.

Faculty Development. Kranke et al. (2013) found that students who perceive faculty members as supportive and understanding are more likely to

disclose their disabilities on campuses and request accommodations. At the same time, Becker and Paladino (2016) thought that students who perceive faculty members as unwilling to provide accommodations or unapproachable may be less likely to disclose their disabilities. Moreover, Baker et al. (2012) found a discrepancy in the views of faculty members compared to students with regard to the perceived inclusiveness for students with disabilities on campus. These results demonstrated that faculty members tended to view their campuses and classrooms as more inclusive and supportive but underestimated the needs of students with disabilities even as they did not fully understand the unique challenges that such students face.

Professional development opportunities may include informative sessions designed to provide faculty members with data regarding the prevalence rates of various psychiatric disabilities among college students, common myths and misconceptions of mental illness, and effective accommodation strategies to better meet students' needs. Sessions may introduce and reinforce institutional nondiscrimination legal requirements under Section 504 and the ADA. Insofar as faculty members may have advanced education and training only in their fields of study, they may not be explicitly aware of educational laws and policies applicable to students with disabilities. Being aware of such regulations may help faculty members be more understanding when students request accommodations in the classroom or disclose their disability.

Student Development. Little research has been conducted investigating the cognitive, interpersonal, and intrapersonal dimensions of disability. Complicating matters is that different individuals may make different meaning of their disabilities at varying points in their lives. Wisbey and Kalivoda (2011) suggested that individuals who acquire or become aware of disabilities later in their lives, as is often the case with many individuals with psychiatric impairments given common ages of onset, may have a more difficult time coming to terms with their disability identity compared to those who have made such adjustments throughout their entire lives. Student development professionals must be conscious of this when working with students with psychiatric impairments, as these students may not be fully accepting of their impairment, or may not yet be aware of the impact the condition may have on their lives.

The results of this study also revealed that student counseling services on campus were underutilized, even among those with psychiatric impairments who may have benefitted the most from interventions with trained mental health practitioners. As many studies

(e.g., Lazar, 2014; Seligman, 1995) and textbooks (e.g., Corey, 2013; Jongsma, Peterson, & Bruce, 2014) continue to report, counseling and mental health therapy can be very effective in helping decrease the symptoms of a vast number of psychiatric conditions. Further, counseling and mental health therapy can help individuals to learn coping skills to address personal and interpersonal challenges in a more effective manner.

The importance of counseling and mental health support for students with psychiatric impairments in higher education has been documented (Belch, 2011; Eisenberg et al., 2009). Despite this, the low numbers of students using therapeutic resources on campus in this study is problematic and indicative of an underutilization of available and potentially beneficial counseling services.

Student development and counseling center staff members may collaborate to create initiatives to help increase awareness of available counseling services on campus, as well as promote the use of such services on campus as a means of increasing student success. Students should be aware that they do not necessarily need to be in crisis to utilize services, that they may benefit from counseling to help create a positive self-image and to help them find balance with the many pressures they may face. Simply having literature available or email reminders about available services may help students feel more comfortable utilizing them as needed.

Academic and social integration on campus may be powerful factors for increasing persistence and success for college students that can help them to develop inter- and intra-personally (Astin, 1984; Bialka et al., 2017; Tinto, 1997). Belch (2011) thought that recognizing the variables impacting the integration of students with psychiatric impairments on campus is important to supporting their needs and creating collaborative and inclusive student programs. These programs may include student advocacy organizations, student learning communities, student-faculty linkages, or outreach programs to help students better understand their disabilities and the accommodations and services they may be entitled to receive.

Increasing Campus Awareness. Increasing mental health and disability awareness may ultimately help decrease stigma and increase student success. Students, faculty members, and campus staff alike need to be aware of signs and symptoms of various mental health disorders, as well as prevalence rates on campus. However, more importantly than reducing stigma is the need to dispel rumors by addressing fears that some may have about mental illness (Belch, 2011).

It is important for campus officials to create positive cultures towards students with impairments evidenced by literature supporting their needs, accessible buildings and campus grounds, espoused beliefs and values, and a true dedication to nondiscriminatory service delivery. To this end, Hadley (2011) was of the opinion that "Campuses can be a more welcoming place when students feel safe, supported, and encouraged to grow as individuals, and their disabilities are viewed as part of the diversity on campus" (p. 80).

Hartley (2010) posited that just as orientations exist to introduce first-year students to various aspects of the college environment, so should orientations be used to provide students with information related to disability and mental health supports on campuses. According to Salzer et al. (2008), students with psychiatric impairments who were aware of accommodations that were available on campus were more likely to request such accommodations. Eisenberg et al. (2009) found that university officials may, in their efforts to identify students who may be suffering from undiagnosed psychological disorders, adopt mental health screening tools and proactive intervention strategies. Waiting for students to experience mental health crises before offering support will do little to help the overall campus community proactively meet the needs of other students who may be at risk.

Conclusion

This quantitative study examined the impact of disability type, either psychiatric or other, on perceived levels of disability stigma. The study was situated within an equal opportunity framework with an emphasis placed on inclusion of students with disabilities in higher education.

The literature helping to form the foundation of this study suggested that students with disabilities face many challenges related to inclusion on campus and degree completion. At the same time, the literature revealed that stigma related to mental illness may be a factor in students with psychiatric impairments not disclosing their disabilities on campus and requesting accommodations they may be legally entitled to receive. According to the 55 participants in this study, students with psychiatric impairments reported greater levels of perceived disability-related stigma on campus.

This study further exemplifies the notion that there is more work to be done. Although this study focused specifically on students with disabilities, stigmatization is a phenomenon impacting many students who may not perceive themselves as members of campus communities. Faculty members, adminis-

trators, professionals, officials, and other personnel on campuses have a responsibility to advocate for the students they serve and fight to help ensure that their needs are being met. Only through concerted efforts can educational professionals help to expand knowledge, reduce stigma, and facilitate change to improve learning opportunities for students with psychiatric and other types of disabilities, on their campuses.

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Be Ready, Be Well: A Conceptual Framework for Supporting Well-being Among College Students with Disabilities

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Abstract

Although the rate of students with disabilities attending college continues to rise, these students often feel unprepared for college and graduate at discouraging rates. Further, negative outcomes are often exacerbated for college students with disabilities who experience co-occurring mental health needs. Although barriers associated with college success among students with disabilities and mental health needs are well-documented in the literature, there is a notable dearth of information on how to address them. The purpose of this paper is to (a) describe current policies and practices that influence well-being among college students with disabilities; (b) review existing theories, models, and frameworks related to well-being among college students with disabilities; (c) introduce *Be Ready, Be Well*, a conceptual framework that integrates key components of existing policies, practices, theories, models, and frameworks to support well-being among college students with disabilities; (d) provide implications for higher education professionals, and (e) explore future directions for this framework.

Keywords: college, student, disability, mental health, framework

Recent research documents increasing rates of students with disabilities attending institutions of higher education after high school (Fleury et al., 2014; Gelbar et al. 2014; Lombardi et al., 2012). For many students, the transition to college is a time of adventure, excitement, and opportunity. Although exploring one's identity, joining social groups, and identifying personal and professional goals is exhilarating for many college students, those with disabilities often feel overwhelmed by this newfound independence (Dente & Coles, 2012; Roux et al., 2015), resulting in diminished outcomes (Costello & Stone, 2012; Dallas et al., 2015; Gelbar et al., 2014; Hong, 2015; Scheithauer & Kelley, 2014). For example, students with disabilities experience lower graduation rates than their peers without disabilities and often take longer to complete degrees if they do persist until graduation (Hong, 2015; Lombardi et al., 2012).

College students with disabilities report several barriers that contribute to poor outcomes, including: (a) difficulty establishing and maintaining relationships with peers (Dryer et al., 2016); (b) challenges in executive functioning, including setting schedules,

studying, concentrating, and employing time management skills (Dryer et al., 2016; Wolf, 2001); and (c) deciding not to disclose their disabilities or request supports needed to achieve success (Burgstahler & Russo-Gleicher, 2015; Cai & Richdale, 2016; Hong, 2015; Roux et al., 2015). Additional barriers include a lack of student participation in IEP meetings in K-12 settings (Shogren & Plotner, 2012), as well as a failure of K-12 system to include medical evaluations or mental health screenings (Stiffler & Dever, 2015). These barriers often result in students with disabilities remaining unaware of their diagnoses, needs, and required accommodations (Marshak et al., 2010). Such barriers also contribute to students experiencing mental health issues, including frustration, depression, stress, poor health, decreased self-esteem, diminished satisfaction with life, and even self-harm (Bade-White et al., 2009; Gobbo & Shmulsky, 2014; The Steve Fund & JED, n.d.; White et al., 2011). Further, these barriers are exacerbated by students with disabilities co-occurring mental health needs (Anastopoulos & King, 2015; Kreiser & White, 2015; White et al., 2011). In fact, many college students

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with disabilities identify mental health as the area in which they require the most support, regardless of disability type (Francis, Duke et al., 2018; Oswald et al., 2017). Moreover, college professionals have declared a “mental health crisis” on college campuses, as the numbers of students on campus with mental health needs steadily rises (The Steve Fund & JED, n.d., p. 3).

The needs of students with disabilities who also require mental health support is rapidly exceeding existing available resources and services on college campuses (Thornton et al., 2017). Indeed, college administrators report struggling to prepare personnel to effectively support students with disabilities who also have mental health needs (Dryer et al., 2016; Hong, 2015), despite research initiatives designed to support young people with serious mental health conditions such as *Project FUTURES* (an intervention intended to improve college success among first-year college students with mental health needs; Miller et al., 2018). This lack of support and training in college settings highlights the need for a comprehensive framework to support the well-being of college students with disabilities. Although it is challenging to find a common definition of well-being, there is general consensus surrounding some basic elements of well-being, including happiness, vitality, calmness, optimism, involvement, self-awareness, self-acceptance, self-worth, competence, development, purpose, significance, self-congruence, and connection (Longo et al., 2017). For the purpose of this manuscript, the Centers for Disease Control and Prevention (CDC) definition of well-being, or the “the presence of positive emotions and moods (e.g., contentment, happiness) was used, the absence of negative emotions (e.g., depression, anxiety), satisfaction with life, fulfillment, and positive functioning” (CDC, n.d.), to conceptualize this construct.

In order to address the notable and growing need for well-being support for college students with disabilities, the purpose of this paper is to (a) describe current policies and practices that influence well-being among college students with disabilities; (b) review existing theories, models, and frameworks related to well-being among college students with disabilities; (c) introduce *Be Ready, Be Well*, a conceptual framework that integrates key components of existing policies, practices, theories, models, and frameworks to support well-being among college students with disabilities; (d) provide implications for higher education professionals; and (e) explore future directions for this framework.

Policies and Practices that Influence Well-Being Among College Students with Disabilities

This section provides a review of policies and practices that influence well-being among college students with disabilities, as well as barriers and gaps in knowledge related to these domains.

Policies that Influence Well-Being in College

First, perhaps the most important law that supports well-being among college students with disabilities is Section 504 of the Rehabilitation Act of 1973. This antidiscrimination law protects college students with disabilities by ensuring equal opportunities for participation in college-sponsored groups and activities, as well as academic accommodations (e.g., extra time to complete a degree, adaptations to instruction, audio texts) provided through a campus disability service office. Although support provided by disability service office staff can help students with disabilities succeed in college (Burgstahler & Russo-Gleicher, 2015; Dente & Coles, 2012), there exists a paucity of data regarding the effectiveness of these services and college students with disabilities note that mental health is an area of support that is not adequately addressed in college (Francis, Duke et al., 2018). Further, students must disclose that they have a disability and be determined eligible for services provided by the Rehabilitation Act (1973) prior to receiving support. However, many students with disabilities elect not to disclose their disability in college and, therefore, are not legally entitled to services (Roux et al., 2015; Yssel et al., 2016).

Second, the Family Educational Rights and Privacy Act (FERPA, 1974) is designed to protect student confidentiality by transferring the right of disclosure of educational records and information from parents to students once they enter college. However, there is overwhelming evidence that families provide crucial, on-going support for their family members with disabilities during college and into adulthood (Boehm et al., 2015). For example, families provide ongoing logistical support (Dallas et al., 2015), guidance (Hirano & Rowe, 2015), and emotional support (Dipeolu et al., 2015) as their family members with disabilities age. These forms of support are often especially important for college students with disabilities who also have mental health needs (Dallas et al., 2015), as research reports that college students with disabilities frequently reach out for their families for support in times of crisis or emotional need (Francis, Duke et al., 2018; Francis, Register et al., 2019). However, unless a student signs a waiver, FERPA regulations prevent college staff from interacting with families to provide well-being support to students, as needed. In

addition, families often experience difficulty “letting go” once their young adults enter college, resulting in higher levels of stress and depression among both families and college students with disabilities (Francis & Reed, 2019).

Practices that Influence Well-Being in College

There are several practices that, based on previous research, likely have a positive influence on well-being among college-age students with disabilities. Such practices include: (a) positive reframing or reappraisal (e.g., thinking optimistically about a negative situation; Beighton & Wills, 2017); (b) variations of cognitive behavior therapy (e.g., replacing negative thoughts with more constructive ones; Anclair & Hiltunen, 2014; Mackay et al., 2017; Oswald et al., 2017; White et al., 2010); (c) dialectical behavioral therapy (e.g., training to help individuals learn strategies to set goals and increase emotional problem solving skills; Mazza et al., 2016; Perry-Parrish et al., 2016); (d) acceptance and commitment therapy (e.g., accepting negative emotional experiences and taking actions to rectify those experiences; Perry-Parrish et al., 2016); and (e) various mindfulness techniques (e.g., training to be fully present in the moment and better control responses to overwhelming circumstances; Bazzano et al., 2015; Benzies et al., 2013; Lunskey et al., 2017; Perry-Parrish et al., 2016; Reid et al., 2016; Thornton et al., 2017). Peer support groups are also found to increase well-being and quality of life among individuals with disabilities (Beighton & Wills, 2017; Lunskey et al., 2017; Riemersma et al., 2015). Many of these practices are also found to benefit family members of individuals with disabilities (Bazzano et al., 2015; Heifetz & Dyson, 2016; Rayan & Ahmad, 2016; White et al., 2010), which is important considering the ongoing support and influence they provide (Boehm et al., 2015).

Despite evidence of practices increasing well-being, there are numerous gaps in the literature related to well-being among college students with disabilities, including a lack of research or professional expertise in supporting this population (Firth et al., 2010; Oswald et al., 2017), especially those with more significant disabilities or with co-occurring disabilities and mental health needs (Perry-Parrish et al., 2016; Wark, 2012). Further, few studies have investigated well-being interventions among college-age students with disabilities (Francis, Stride et al., 2018), many well-being interventions do not utilize family involvement as a way to support students (Al-Yagon, 2015; Hu et al., 2010; Riemersma et al., 2015), and few studies investigate long-term outcomes of well-being practices on quality of life (Anastopoulos

& King, 2015; Perry-Parrish et al., 2016; Rayan & Ahmad, 2016). Moreover, many well-being practices are implemented by licensed professionals (e.g., clinical psychologists; Francis, Duke et al., 2019); experts to which many students may not have access. Further, access to well-being support in college is often eligibility-based or requires individuals to disclose a disability or demonstrate a need for support. This is concerning, given the stigma frequently associated with mental health needs and student hesitancy to seek out support they consider stigmatizing (Francis, Duke et al., 2018; Cai & Richdale, 2016; Roux et al., 2015). Finally, there exists a need for innovative approaches to address well-being among college-age students with disabilities (Thornton et al., 2017), including a model that comprehensively and efficiently considers student and family support to facilitate long-term well-being (Berszán, 2017).

Existing Models, Theories, and Frameworks that Influence Well-being Among College Students with Disabilities

This section provides a brief description of four commonly cited models, frameworks, and theories that can help one examine individual development and utilization of well-being practices, as well as an explanation of how the *Be Ready, Be Well (BRBW)* Framework (which will be introduced in the subsequent section) builds off existing models to support the well-being and success of college students with disabilities.

Bronfenbrenner’s Model of Human Development

The Process-Person-Context-Time (PPCT) model of human development created by Urie Bronfenbrenner involves four components theorized to significantly impact human development (Bronfenbrenner, 2005). The first component in the PPCT model is “proximal processes,” which includes the nature of ongoing and bidirectional interactions between an individual and the people, objects, and environmental factors that influence their development. The second component is “person,” or how an individual’s characteristics, including their race, gender identity, disposition, experiences, skills, needs, and capacity to change proximal processes influences their development. The third component is “context,” or four nested systems that surround a person: (a) the microsystem (e.g., structures that come into direct and ongoing contact with the person including families, teachers, close friends, and co-workers); (b) meso-system (e.g., interactions among microsystem structures); (c) exosystem (e.g., structures that indirectly

influence an individual such as family well-being and available services and resources); and (d) macrosystem (e.g., social structures such as values, customs, and bias; Bronfenbrenner, 2005). The fourth component of this model is “time,” or the influence of changes over time on an individual’s development (e.g., aging).

This model is applicable to the development of the *BRBW* Framework, as it recognizes multiple factors that influence human development and subsequently impact well-being among college student with disabilities, including: (a) personal characteristics such as agency, gender, disability, and mental health needs; (b) family and educator support and interactions; (c) available services and resources such academic, social, and mental health support; (d) stigma and discrimination that are often associated with disabilities and mental health needs; and (e) changes over time such as transitions to and from college. Of the three models present in this section, the PPCT model is the most overarching model of human development, in that it comprehensively identifies components that influence an individual’s development across the lifespan. The next theory introduced narrows the focus of human development to family systems.

Bowen Family Systems Theory

Bowen family systems theory postulates that human behavior is profoundly influenced by complex family interactions (Gilbert, 2004). More specifically, this theory emphasizes that family units are intensely emotionally interdependent, as family members consistently seek and react to each other’s thoughts, responses, needs, and actions. Unsurprisingly, this theory notes that family units characterized by trusting and supportive relationships results in comfort and stability for family members, whereas those characterized by contentious or distrustful relationships results in distress, anxiety, low motivation, and other negative outcomes. Bowen family systems theory is comprised of eight concepts: (a) triangles (e.g., three-person emotional relationships); (b) differentiation of self (e.g., establishment of identity and elements of independence and dependence on others); (c) nuclear family emotional system (e.g., relationship patterns and fusions that result in the transfer of negative emotions from one family member to another); (d) family projection process (e.g., ways in which parents impart emotions and differentiation to their offspring); (e) multigenerational transmission process (e.g., differences in shaping emotions and differentiation across generations of family members); (f) cutoff (e.g., family members managing emotional issues with each other through disengagement); (g)

sibling position (e.g., the influence of birth order on characteristics and functioning); and (h) societal emotional processes (e.g., the influence of societal crisis and advancement have on family functioning).

This theory is applicable to the development of the *BRBW* Framework because it reinforces the importance of family interdependence, and, as a result, the importance of parents and other caregivers being equipped with skills to regulate their own well-being and support the wellness of their children throughout the lifespan. Further, although this theory is not disability-specific, it is directly applicable to families with college students with disabilities, as research commonly reports heightened levels of stress among caregivers for this population (Bazzano et al., 2015). The next framework describes the provision of community-based mental health services for children and youth.

System of Care Framework

The system of care framework is designed to support a coordinated network to provide life-long mental health services and supports to children and adolescents with or at risk for mental health needs (Stroul et al., 2010). The three values that guide this framework assert that mental health services and support should family-driven and youth-guided, community-based, and culturally and linguistically competent. This framework also contains 12 guiding principles, including: (a) ensuring the availability of comprehensive community-based services for youth and their families, (b) providing individualized services characterized by holistic service planning, (c) delivering services in the least restrictive environment, (d) ensuring that youth and their families partner with professionals in service planning and delivery, (e) ensuring interagency collaboration among differing service providers and agencies, (f) providing case management, (g) providing developmentally appropriate services, (h) providing developmentally appropriate services during the transition to adulthood, (i) facilitating early identification and prevention of mental health needs, (j) developing monitoring procedures, (k) promoting self-advocacy and protection of rights, and (l) providing non-discriminatory and culturally responsive services.

This framework informs the development of the *BRBW* Framework because it highlights: (a) the important role of families and family support, (b) the need for comprehensive mental health supports and services characterized by interagency support, and (c) the importance of prevention and early identification of mental health needs, as well as consideration of service provision during transition to adulthood.

Further, although the basic tenants of the framework are not specific to individuals with disabilities, the framework does note the importance of providing developmentally appropriate mental health services. The next framework discussed dives deeper into supporting well-being of college students.

Equity in Mental Health Framework

The Equity in Mental Health Framework is designed to provide institutions of higher education strategies to support the emotional well-being and mental health among college students of color, as these students commonly experience heightened levels of anxiety, depression, and stress (Vidourek et al., 2014). This framework includes eight recommendations: (a) make emotional well-being and mental health among college students of color a campus-wide initiative; (b) incorporate student feedback on emotional well-being and mental health; (c) recruit and train diverse and culturally competent faculty and staff; (d) engage in discussions related to current events that impact students of color; (e) hire dedicated staff to support well-being and mental health initiatives; (f) create accessible and responsive communication systems for students, faculty, and staff to discuss well-being and mental health ideas, concerns, or issues; (g) provide dynamic and culturally relevant well-being and mental health programs; and (h) actively promote well-being and mental health programs and services to students (The Steve Fund & JED, n.d.).

This framework is applicable to the development of the *BRBW* Framework because, although the triggers may differ, like students of color, students with disabilities experience heightened levels of anxiety, depression, and stress in college (Dente & Coles, 2012). It also goes without saying that, like gender and other individual characteristics, race and disability are not mutually exclusive. Moreover, the Equity in Mental Health Framework includes systemic implementation strategies to accompany recommendations that may be applicable to students with disabilities.

Despite the contributions that each of these models, theories, and frameworks make toward developing an understanding of factors that influence well-being practices among college students with disabilities, none of them specifically focus on how to develop and sustain well-being for this population. Further, while many of them note the importance of ongoing family involvement, none address this construct in college settings. This is especially important, as family involvement and family-professional interactions dramatically change in college due to policies such as FERPA (Francis et al., 2016). As a result, there exists a need for a comprehensive framework that addresses

how to support mental health and well-being for students with disabilities, including the recognition of commonplace barriers. This can only occur by integrating essential aspects of the aforementioned theoretical work, considering the specific needs of college students with disabilities, and benchmarking existing best practices and policies.

The *Be Ready, Be Well* Framework for Well-Being in College

This section provides a description of the *Be Ready, Be Well* conceptual framework. The purpose of this framework is to support college students with disabilities to be ready for common barriers experienced in college and be well by implementing well-being practices and supports. *The Be Ready, Be Well (BRBW) Framework* depicted in Figure 1 includes three components or interrelated “cogs” that influence well-being among college students with disabilities: (a) well-being practices, (b) students with disabilities, and (c) family. The framework also includes barrier “wedges,” or obstructions that cause distress or prevent well-being from occurring. The turning of the cogs within this framework reflects the interdependence and bi-directional nature of well-being among families and students with disabilities, consistent with literature on the importance of family support and interdependence (Gilbert, 2004; Oswald et al., 2017).

Barrier Wedges

As previously discussed, there are numerous barriers that make well-being challenging for college students with disabilities. The *BRBW* Framework conceptualizes barriers as “wedges” that disrupt the framework cogs from functioning. As the PPCT module of human development (Bronfenbrenner, 2005) and Bowen family system theory (Gilbert, 2004) postulate, a wedge in any cog disrupts the entire system. For example, student-related barrier wedges such as depression (Rohde et al., 2018) and difficulty developing relationships (Dryer et al., 2016) interferes with their ability to effectively cope and experience success, which can create family-related wedges such as stress (Oswald et al., 2017) and caregiver fatigue (Francis, Register et al., 2019).

In a qualitative study comprised of interviews of eight college students with disabilities, students reported feeling depressed, inadequate, and generally insecure when comparing themselves to their peers without disabilities (Francis, Duke et al., 2019). These feelings led several participants to purposefully selecting majors based on their insecurities or concerns related to their disabilities (e.g., “I would have

stayed in elementary education....However, I didn't feel that I was able to teach upper grades, 4th, 5th, 6th, because of my disabilities...because I struggled.”; Francis, Duke et al., 2019, pg. 252). These are examples of how student-related wedges or barriers including depression, inadequacy, and isolation influence major life decisions. In turn, the authors found these barriers caused family stress, as students reported feeling disconnected or isolated from family as a result of their disability. One student described her family looking “so depressed and so sad...they feel bad for their child. They still carry this stigma” of having a disability (Francis, Duke et al., 2019, pg. 252).

Just as student stress can result in family stress, additional family-related barrier wedges such as financial strain and a lack of support to provide effective care to their family members with disabilities (Hoffman & Mendez-Luck, 2011) can create student wedges such as debt (Chambers et al., 2013) and an inability to effectively problem-solve in college (Anastopoulos & King, 2015). As one may imagine, the bigger the wedge or the greater number of wedges a person experiences, the greater the disruption and, therefore, the greater the need for students and families to be ready to employ effective well-being practices to keep the framework churning.

Well-being Practices Cog

Awareness and understanding of barrier wedges coupled with the ability of families and students with disabilities to utilize multimodal mental health and well-being practices is crucial in the *BRBW* Framework (Francis, Regester et al., 2019). According to this framework, well-being practices should include research-based assessment techniques and well-being strategies known to support young adults with disabilities and families such as mindfulness and meditation (Bazzano et al., 2015; Heifetz & Dyson, 2016; Milligan et al., 2015), dialectical behavior therapy (Mazza et al., 2016), goal-setting (Eddy et al., 2015), cognitive behavior therapy (Murphy et al., 2017), reflective listening (Murphy et al., 2017), and physical exercise (Arora & Saldivar, 2013) delivered in both individual and group instruction (Francis, Duke, Fujita et al., 2019). Student and family-specific practices should complement each other to reflect the importance of family support, interconnectedness, and interdependence (Gilbert, 2004). In this way, the *BRBW* Framework recognizes the power of bi-directional nature of relationships and reciprocal support to overcome student and family wedges. College students with disabilities reported that individualized mental health services (e.g., weekly therapy) were effective and helpful when entering a university (Francis,

Duke, Fujita et al., 2019). Students also reported benefiting from university faculty and staff who provided “genuine support,” “point[ed] out patterns” of behavior, and “made a conscious effort” to help them learn how to correct negative patterns of behavior (Francis, Duke, Fujita et al. 2019, pg. 253).

In addition, consistent with The Equity in Mental Health (The Steve Fund & JED, n.d.) and system of care (Stroul et al., 210) frameworks, practices included in the well-being cog should also be systemic across institutions (e.g., safe spaces, systematic student outreach) and interagency/departmental collaboration. Further, well-being is the largest cog in the *BRBW* Framework. That is because, with enough force (or knowledge, practice, and motivation), use of well-being practices can help students and families and support each other to push through barrier wedges they encounter. The force that drives the well-being cog becomes most powerful when students with disabilities and their families engage in effective well-being practices in tandem (Francis et al., 2017).

Students with Disabilities Cog

Personal characteristics such as agency, perseverance, disability, and mental health influence individual outcomes (Bronfenbrenner, 2005). In college, students must be ready to exert greater levels of independence and self-advocacy, as policies such as FERPA (1974) and the Rehabilitation Act of 1973 require students to independently seek and obtain needed services. This is consistent with literature on the importance of individuals with disabilities developing self-determination, as increased self-determination is found to enhance positive outcomes for individuals with disabilities, such as greater autonomy, independence, and employment (Wehmeyer & Palmer 2003; Wehmeyer & Schwartz 1997). For this reason, students must understand and express their needs, preferences, and strengths (Anastopoulos & King, 2015). In order to achieve these outcomes, students must be aware of their disabilities and have a clear understanding of their strengths and challenges. Some college students report not knowing about their diagnoses until late in high school or early in college, as exemplified by one student with a disability:

They knew something was wrong but they...put me into a regular 3rd grade class and then stuck me in the back of the room and nobody helped me. So probably some of my difficulties may have come from a lack of proper education because I wasn't helped. (Francis, Duke, Fujita et al., 2019, pg. 253)

The *BRBW* Framework focuses on the need for students to develop a better sense of self, as well as agency and self-regulation to enact well-being practices to overcome wedges. This is the second largest cog within the framework because, while family interdependence is a key consideration (Stroul et al., 2010) it is imperative that all services and supports are student-centered in college. This cog's rotation is critical to promote student well-being and success, as well as to keep the framework in motion, even when barrier wedges occur.

Family Cog

Family support and interdependence are key factors that influence outcomes among college students with disabilities (Boehm et al., 2015; Lindstrom et al., 2011). In fact, family involvement can support numerous positive student outcomes, including enhanced self-determination (Morningstar et al., 2010). Although students are expected to increase their autonomy and self-advocacy in college, families (e.g., parents, caregivers, grandparents, siblings, close family friends) continue to be emotionally interconnected and often interdependent (Gilbert, 2004). As students enter college, parents are expected to step back as the primary decision-maker and, instead, provide guidance, recommendations, and decision-making support (Francis et al., 2016). However, colleges can tailor campus orientations to support families of students by creating opportunities for families to share their fears and concerns and meet campus staff (e.g., campus police, disability support office staff, mental health staff) who can assist their young adult if needed (Francis et al., 2017; Shmulsky et al., 2015). College campuses can also create workshops designed to complement the mental health strategies provided to their children such as mindfulness and meditation and physical activity (Heifetz & Dyson, 2016; Milligan et al., 2015). College professionals should also refer families to professional organizations and other resources such as The Arc of the United States (<http://www.thearc.org>), Parent to Parent USA (<http://www.p2pusa.org/p2pusa/sitepages/p2phome.aspx>), or Understood (<https://www.understood.org/en/schoollearning/choosing-starting-school/leaving-highschool>) to assist them to learn about to best support their young adult and themselves during the college experience (Francis et al., 2017). The *BRBW* Framework recognizes the need for family members to maintain their own well-being so that they are able to assist their students with disabilities in overcoming barrier wedges as they arise. As with students, the turning of the family cog helps keep the framework in motion to maximize well-being.

Future Directions for the *BRBW* Framework

The *BRBW* Framework addresses a need consistently documented in the literature by conceptualizing a way to approach well-being among college students with disabilities (Berszán, 2017; Thornton et al., 2017). The *BRBW* Framework is unique in that it addresses known barriers, pulls together components of existing theories, models, and frameworks that influence and support well-being, and recognizes the importance of family influence and interdependence. As a result, key stakeholders, including students with disabilities, families, and college faculty and staff can use the *BRBW* Framework to conceptualize how to best support well-being among students with disabilities, as well as the significant number of other students with support needs who choose not to disclose their disabilities.

The *BRBW* Framework does not prescribe a specific methodology or practice to address the needs of students with disabilities because, as Bronfenbrenner's PPCT model (2005) and Bowen family systems theory (Gilbert, 2004) highlight, human development is in a constant state of flux. Therefore, the *BRBW* Framework is designed to support the use of practices found effective for diverse and dynamic college students with disabilities. Specifically, the well-being practices cog is designed to include established, but malleable, research-based well-being practices that are: (a) flexible to meet the diverse needs of students with disabilities and their families while remaining respectful of unique family systems; (b) motivating and socially valid for stakeholders; (c) practical (e.g., reasonable time commitment for stakeholders to implement, ability to be implemented with integrity by trained, non-licensed professionals); and (d) sustainable (e.g., stakeholders can implement practices over time with greater degrees of independence, perhaps with the use of technology such as apps and peer support groups).

Implications for Practice

The *BRBW* Framework could serve as a foundation for disability services offices and other higher education professionals to consider ways in which they (a) assess student needs, (b) provide student support, and (c) consider how they collaborate with families and other professionals on campus and in the community. For example, the *BRBW* Framework could serve as a starting point for coordination and collaboration among various campus departments and centers (e.g., centers for health and well-being, departments of psychology and social work); professional organizations (e.g., The Association of High-

er Education Parent/Family Program Professionals, College Autism Network); and community resources (e.g., The National Alliance on Mental Illness) to ensure well-being practices are effective, relevant, and sustainable (Francis et al., 2017). Disability services offices could serve as the central point for cross-campus collaboration by coordinating support efforts with mental health providers and college departments to provide streamlined assistance to students. Professionals could also build off of the *BRBW* Framework to create a streamlined paperwork portal that students, families (if appropriate), mental health professionals, and disability support personnel could access in order to provide immediate and ongoing support to students when they enter college or are diagnosed with a disability or mental health condition while in college.

Further, disability professionals in higher education could use the *BRBW* Framework as a foundation for developing and refining policies and programs to better support student mental health. For example, university policies and practices could promote screening and evaluation related to mental health and disabilities for all incoming freshmen, as well as reconsider how to involve families in their young adult's wellbeing in ways that are appropriate for college-age students and observe federal laws (e.g., FERPA waivers). In fact, the *BRBW* Framework could serve as a foundation to create coursework designed to address each cog, including mandated course(s) designed to teach well-being strategies (e.g., mindfulness, meditation, physical exercise, nutrition); course(s) designed to address student needs (e.g., perseverance, executive functioning, self-determination, self-awareness of needs and strengths); and course(s) designed to address family interdependence (e.g., free online webinars for families to learn well-being strategies that compliment those being taught to students, webinars and/or webpages dedicated to providing families well-being resources and information to support college students). Higher education professionals may also modify existing programs designed to support the transition of individuals with severe mental health conditions into adulthood such as the Transition to Independence Process (Dresser et al., 2014), which is based on the system of care principles, to design coursework and otherwise meet the needs of college students with disabilities and mental health needs in college.

Moreover, disability services offices may use the *BRBW* Framework to advocate for dedicated personnel, supports, and services designed to address each cog in the framework at their institution. Further, if properly staffed, disability services offices could also coordinate professional development efforts related

to each cog of the *BRBW* Framework so that faculty and staff could learn more about how to support students with disabilities, mental health diagnoses, and other related needs through the provision of proactive approaches such as the use of universal design for learning and creating a campus culture that values well-being (Burgstahler & Russo-Gleicher, 2015; Okanagan Charter, 2015). These professional development activities would also provide an opportunity for faculty and staff to learn how to access mental health support for students as well as to learn more about what resources, services, and supports exist on campus.

Future Research

Future research is needed to determine effective well-being practices for college students with disabilities and their families that can provide colleges with flexible, research-based guidelines and resources consistent with the *BRBW* Framework and can be carried out by educators, support personnel, and others who do not have clinical psychology backgrounds through a train-the-trainer model in order to ensure equitable access to needed support. Further, there exists a need for future research to better understand the most effective, practical, and desirable practices for supporting well-being among college students with disabilities and subsequently develop and pilot a curriculum that reflects the *BRBW* Framework. In addition, a key component of *BRBW* framework is to "be ready" to employ well-being practices. Research notes the importance of effective, school-based intervention programs to support well-being among adolescents with disabilities, including student-based planning, functional life skills, social skills, goal attainment, interagency collaboration, and family involvement (Mackay et al., 2017; Maz-zotti et al., 2012).

As the *BRBW* Framework is operationalized and researched in colleges, a formalized *BRBW* curriculum should also be adapted and incorporate these approaches for the high school level so that students and families might better prepare for the rigors of postsecondary life. Such a program would provide students opportunities to learn well-being practices, practice implementation, undergo failure, and experience the satisfaction and pride that accompanies overcoming challenges *before* they find themselves in crisis in college. This need is consistent with the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), which calls for effective, individualized transition planning characterized by parent involvement and interagency collaboration, as well as the Taxonomy for Transition Programming 2.0

(Kohler et al., 2016), which calls for student development, family involvement, interagency collaboration, and professional competence. The *BRBW* Framework would be especially important during this crucial stage of student development, as IDEIA transition-planning regulations are generally vague in nature (U. S. GAO, 2012) and there exists a lack of research on the efficacy of transition strategies, best practices, and ways in which to maximize family involvement and interagency collaboration (Haines et al., 2017; Mazzotti et al., 2012; Morningstar & Mazzotti, 2014).

Conclusion

Left unaddressed, the mental health needs of college students with disabilities results in diminished outcomes. However, a comprehensive approach to address well-being among this population may mitigate the mental health crisis unfolding on college campuses across the U.S. The conceptualization of the *BRBW* Framework provides a crucial starting point for key stakeholders to conceptualize well-being support among college students with disabilities. However, future research is needed to develop and pilot a flexible curriculum that reflects this comprehensive framework.

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Figure 1

The Be Ready, Be Well Conceptual Framework. This figure illustrates the bidirectional relationships between the three cogs of the Be Ready, Be Well Framework: well-being practices, students with disabilities, and families. Barriers to well-being are displayed as striped wedges.



Aided by Extant Data: The Effect of Peer Mentoring on Achievement for College Students with Disabilities

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Abstract

While peer mentor programs for students with disabilities in higher education are increasing in prevalence, the research examining the effectiveness of these programs remains limited. In this study, the effect of one college peer mentoring program on academic performance at a small, private four-year university was examined. The sample was drawn from all students registered with the Office of Disability Services ($n = 287$), some of whom participated in a peer mentoring intervention as well as a comparison group comprised of non-participants. In light of the observational nature of the data, propensity score weighting and matching were used to adjust for possible confounding variables and to explore robustness to different methodological approaches. Logistic and linear regression methods were used to examine the effect of peer mentoring on academic probation status and grade point average (GPA), respectively, while incorporating propensity score-based adjustments. There were no significant differences between the intervention and comparison groups for either outcome; however, intervention group students had a statistically significantly higher number of accommodations available to them. The study illustrates that extant data, when used in conjunction with appropriate statistical adjustments, is a viable alternative to randomized studies. Implications for higher education researchers and practitioners are discussed, including suggestions to collect various types of non-academic data (e.g., satisfaction, well-being, self-determination surveys) as well as examine structural factors of the program (e.g., mentor-mentee relationships, mentor training) in order to better understand the possible benefits of peer mentor programs and the need for collaborative partnerships between disability services, student affairs, researchers, and institutional research staff.

Keywords: peer mentoring, college students, disability services, propensity score matching, propensity score weighting, quasi-experimental design

As institutions of higher education enroll growing numbers of students with disabilities (SWD), there is an intensified need to develop support programs for these students. Encompassing approximately 11% of undergraduate students, SWD earn fewer credits and are less likely to complete degrees than their peers without disabilities (41% vs. 52%) (Newman et al., 2011). Although they leave postsecondary education for reasons that may be similar to their peers without disabilities (e.g., cost, poor grades, transferring out, health demands and/or family demands), some of these issues may be associated with or exacerbated by disability-related complications (e.g., not using accommodations, increased health or medical issues). As such, college SWD may face multiple barriers that are similar to their peers without disabilities, yet they also have unique disability-related needs that may

further compound barriers to successfully completing college degree programs.

While institutions of higher education continue to develop resources to support the unique needs of SWD, research conducted in college settings should inform these practices. Peer mentoring programs, an emerging resource for college students, may be a promising support for SWD. The purpose of this study was twofold: (a) to examine the effectiveness of a peer mentor program for college SWD, and (b) to employ propensity score weighting and matching to extant institutional data. Findings show the promise of using extant data in conjunction with advanced methods for extracting causal estimates from such data as a viable alternative to randomized control group designs in college settings.

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College Peer Mentor Programs

Colleges and universities continue to utilize peer mentor models to offer a naturalistic form of support for students (Budge, 2006). These programs aim to connect a less experienced student with a more advanced individual to promote academic and personal growth. Capitalizing on the experience of upperclassmen, this approach connects novice learners with mentors who are also approachable and relatable (Collier, 2015). Peer mentors can support diverse aspects of a mentee's development, including academic, cognitive, psychological, motivational, or social (Izzo & Shuman, 2013; Jones & Goble, 2012). As both an elder and a peer, a mentor has a unique opportunity to serve as not only a coach but also as a trusted friend, student advocate, and connection to campus resources (Colvin & Ashman, 2010). Forming both personal and reciprocal relationships with their mentees, peer mentors may offer an alternative to fulfill the complex and personal needs of students, especially those undertaking their first year of study (Crisp & Cruz, 2009; Nora & Crisp, 2007; Ward et al., 2014).

Peer Mentor Programs and Outcomes

Despite the potential promise of these supports, peer mentoring programs in higher education have rarely been examined using rigorous quantitative methods. While few in number, several preliminary quantitative studies at large public universities suggest that active participation in peer mentoring programs may have a positive relationship with academic outcomes (Hryciw et al., 2013; Rodger & Tremblay, 2003). In a randomized control study, Rodger and Tremblay (2003) observed that students who were assigned to and actively worked with peer mentors achieved significantly higher grades than a control group who did not work with mentors. In a non-experimental study of a peer mentor program, Hryciw and colleagues (2013) also found an improvement in grades of students who participated in peer mentoring. Other non-experimental studies have produced qualitative reports from peer mentored students who indicated that their learning had been improved by working with a peer mentor (Fox & Stevenson, 2010; Hryciw et al., 2013; Smith, 2007). Together these findings show emerging evidence of the effects of peer mentor programs for college students, yet quantitative study designs that imply causal inference remain sparse in the literature.

Peer Mentor Programs and Subpopulations

Peer mentor programs have promising results for other minority student groups, such as students

of color, and the LGBT community (Budge, 2006). While these different student subpopulations do not necessarily include SWD, these findings suggest peer mentoring could be applicable to SWD as they may face similar barriers or stressors upon entering higher education. One phenomenological study found that Latino/a students benefitted from sharing common experiences and challenges with older student mentors with regard to learning to network and building positive relationships, and several students in this same study conveyed that without the mentoring program, they may not have continued at the university (Salas et al., 2014). Oaks et al. (2013) examined a mentoring program that focused on leadership development of African American male college students. Although the program involved additional elements, such as adult mentoring, qualitative interviews revealed that the students felt their interpersonal skills improved through peer mentoring. Participants specified that peer mentoring provided psychosocial support and feedback and served as a valuable learning platform.

Preliminary research assessing mentoring programs for college students who identify as LGBT have also suggested favorable outcomes. Renn (2007) and Renn and Bilodeau (2005) described qualitative studies investigating student identity, leadership, and activist development at three institutions in the Midwest. Both studies found that in most instances, students identified peer mentoring experiences, both formal and informal, to be an integral part of their development particularly with regard to locating LGBT-affiliated groups on campus, which in turn guided them to take on formal leadership positions within these communities and create lasting friendships. Given the positive experiences of other student subpopulations, research on peer mentor programs should continue with an aim to explore the impact on SWD. While SWD are a growing subpopulation in college settings, these students do not achieve comparable academic outcomes to their peers without disabilities (Newman et al., 2011); this discrepancy highlights the need to identify effective practices to support these learners.

Peer Mentor Programs for Students with Disabilities

Peer mentoring programs for SWD are becoming more prevalent on college campuses, although few studies have assessed these programs' efficacy. Brown et al. (2010) conducted a systematic literature review on peer mentor programs for SWD, where the majority were students with learning disabilities and attention deficit hyperactivity disorder (ADHD). Common themes identified included the use of tech-

nology to connect mentors and mentees, self-reported increases in motivation, time management, and attitude, as well as one study that noted students involved in mentoring identified a decrease in academic anxiety. Other studies found that postsecondary SWD who participated in peer mentoring programs self-reported satisfaction and an increase in their social skills and self-efficacy (Ames et al., 2016; Zwart & Kallemeyn, 2001).

Broadly, studies exploring effective practices in higher education and disability, including peer mentoring, lack enough rigor to make causal inference. In a recent systematic literature review examining articles published in the *Journal of Postsecondary Education and Disability* from 1983 to 2012, findings show that only six studies utilized a control or comparison group (Faggella-Luby et al., 2014), a critical feature of a quantitative design that allows for causal inference (Odom et al., 2005). While these findings are based on articles published in a single journal, it should be noted this journal is the only one of its kind that focuses on research supporting college SWD. Additionally, researchers studying the prevalence and depth of disability-related studies across multiple higher education journals found a limited number of rigorous quantitative research designs (Dukes et al., 2017; Madaus et al., 2018). This limitation is a concern mainly because rigorous quantitative research methods will allow for identification of evidence-based practices in higher education settings, and this gap in the literature hinders efforts to improve outcomes for college SWD.

While some research studies have shown promise in the effectiveness of peer mentor programs, it is imperative to assess causal relationships between peer mentor programs and improved academic outcomes in order to establish evidence-based practices (Odom et al., 2005). As of 2010, only ten studies on this topic showed that peer mentoring could qualify as an evidence-based practice (Brown et al., 2010). Unfortunately, even within those studies, sample sizes were small and at least one (Zwart & Kallemeyn, 2001) reported possible disparities between the treatment and control groups. Researchers must employ causal inference designs to assess the effectiveness of these programs while acknowledging the challenges of implementing random assignment in real-world settings. The purpose of this study is to add to the research base on the effectiveness of peer mentor programs for college SWD. Specifically, the study compares academic outcomes for SWD in a college peer mentoring program to the outcomes of their peers with disabilities not involved in the program at one four-year institution. Propensity score weighting and matching meth-

ods were employed in order to demonstrate that rigor can be preserved even in a retrospective study using extant data when appropriate methods are utilized. These analytic approaches illustrate that leveraging extant data readily available through a university data warehouse to study the effectiveness of peer mentoring can be a viable alternative to randomized designs.

Method

Participants

Participants were students who attended a small, private university in New England from Fall 2014 through Spring 2016. The entire sample was comprised of 287 SWD; of which 46 (16%) were mentees in the Peer Mentoring program and served as the intervention group, and 241 were comparison students who did not participate in the Peer Mentoring program. Conditioning on the full sample, 39% had overlapping disabilities (i.e., comorbid), the most prevalent overlapping disability category observed was ADHD (40%), followed by LD (39%); with 3.52 mean of accommodations ($SD = 2.16$). The majority of the SWD were Male (63%) and White (88%). Table 1 contains detailed sample characteristics.

The Peer Mentor Program

The peer mentor program (PMP) was the intervention in the current study. The PMP matched trained undergraduate mentors with students registered with Student Disability Services to provide social support and guidance, and was overseen by Student Disability Services staff, psychology department faculty members, and Ph.D. students in the Behavior Analysis program. Mentors included sophomore, junior, or senior psychology majors who wanted to learn more about peer and social supports. After interviewing with Student Disability Services, mentors attended two 1.5-hour supervision sessions with mentor supervisors and current mentors to complete initial training requirements, including an introduction to Applied Behavioral Analysis, the services offered by Student Disability Services, how mentors can assist students, and the types of issues mentees may experience. Training also included role-playing so that new mentors could practice responding to different situations that may arise when working with mentees.

The PMP primarily served students with autism spectrum disorders, ADHD, or executive functioning impairments. PMP is introduced to students at freshmen orientation or during their intakes with Student Disability Services before they arrive at the university. As such, most mentees started working with peer mentors as freshmen. Both mentors and mentees

committed to participate with the program for at least one year, and were able to continue until graduation.

Mentors typically met with mentees for one hour per week, sometimes for one long session, two half hour meetings, or four 15-minute meetings; meeting times were adjusted to the needs of the mentee. During the first interaction, mentors helped mentees define the measurable goals they wanted to accomplish and created plans to track success. Subsequent sessions focused on practicing goal-related tasks and reviewing mentees' progress.

Mentors were encouraged to establish a plan for each meeting. Typical activities included reviewing and planning future homework and study strategies, helping mentees to schedule their time, or practicing conversation or social interaction strategies. Mentors could suggest different ways to introduce oneself into a conversation, how to assess when it is appropriate to enter a conversation, or ways to get involved on campus, depending on the mentees' areas of difficulty. As many mentees struggled with peer interactions, the act of having a time and space to rehearse social skills was beneficial (Ward et al., 2014). Mentors maintained contact logs for every appointment, which they shared with Student Disability Services during weekly supervision.

Procedures

The gold standard for making causal inferences about the average effectiveness of a program is to utilize an experimental design, whereby individuals either receive the treatment (i.e., are placed into the program), or are placed into the control group (i.e., are not placed into the program) as the result of an entirely random process. Thus, in a randomized study the individuals receiving treatment are just as likely to have been placed in the control group (i.e., not placed in the program). In the event such a randomized design is employed, treatment assignment is strongly ignorable in the sense that, on average, those receiving the program and those not receiving it are balanced with respect to all possible covariates (e.g., race, gender, socioeconomic status). In other words, selection into the treatment group does not depend on an individual's race, gender, socioeconomic status, or any other measured or unmeasured variable. However, random assignment to treatment is not always feasible. In the current study the decision to participate in the PMP program or not was made by individual students rather than a random process. Therefore, the current study is an observational study rather than a random experiment.

Inferences about program effectiveness based on observational data require statistical adjustments to account for pre-existing differences between the

treatment and comparison groups. Without adjustments, imbalances on observed covariates (e.g., demographic attributes) can confound inferences about the causal effects of the program of interest. One such example is the PMP in this study, since students in the intervention group self-selected into the program, while students in the comparison group, chose not to participate. All study protocols were reviewed and approved by Institutional Review Boards of the institution at which the intervention took place as well as the researchers' institution.

Measures

All measures were in the form of extant data that universities typically collect and might be housed in a university data warehouse, such as demographics, scores on higher education entrance exams (i.e., SAT); academic data (i.e., number of credits attempted and earned, probation, suspension); and attrition data (i.e., expulsion, graduated, withdrawn).

Covariates. Our propensity score-based procedures aim to achieve balance between the treatment and control groups with respect to the following covariates: gender, minority status, ADHD diagnosis, LD, mental health, and ASD; as well as comorbidity (i.e., multiple diagnoses).

Outcomes. Academic data were available at four separate time points that spanned from the Fall semester of 2014 through the Spring semester of 2016. Of interest was the effect of the PMP on academic standing (i.e., academic probation) and grade point average (GPA). Different patterns of student participation in the PMP created difficulties in determining how to define our treatment indicator variable and which measurement(s) to use to assess outcomes. A total of 8 patterns surfaced. The most common was participation in all 4 semesters, however, this pattern still represented only 30% ($n = 14$) of the intervention group sample. Our decisions regarding how to define treatment and outcome measurement are described in more detail below.

Academic Probation. Intervention students were coded as on academic probation if they were in poor academic standing at the end of their final semester in the PMP. This decision rule allowed the success of the PMP to be determined based on final status of the mentoring, instead of the student's academic standing while actively participating. In terms of comparison students, we coded them as being on academic probation, if they were ever reported to be in poor academic standing during the semesters in which we observed them. In sum, these coding decisions led to 13% of the intervention students ($n = 6$) and 17% of the comparison students ($n = 40$) to be coded as on academic probation.

Grade Point Average (GPA). The observed GPA for an intervention student in their final semester in the PMP was used as the outcome; whereas, comparison student outcomes were taken as their mean GPA across all semesters from which this data was available. The mean GPA for intervention students was 2.524 ($SD = 0.988$) and 2.894 ($SD = 0.722$) for comparison students.

Data Analysis

In this study, we address the non-random selection into the PMP by employing a propensity score weighting and a matching approach. Then, regardless of approach (weighting or matching), the effect of PMP on academic probation was determined via logistic regression – which estimates the log odds of being placed on academic probation; whereas, the effect of PMP on grade point average was estimated using an ordinary least squares regression – which provides an estimate of the average difference between PMP participants and non-participants with respect to GPA. All statistical analyses were conducted in R (R Core Team, 2017).

Propensity Score Weighting. In order to execute a PSW approach, (a) initial bias must be investigated, (b) propensity scores must be estimated and used to generate weights, and (c) the effect of the weights on bias must be assessed. Upon satisfactory reduction of bias, the causal estimate (e.g., the effect of PMP on academic outcomes) can be pursued.

Initial Bias. Logistic regression models are estimated in which each covariate in separate models are regressed onto intervention status. These models are used to determine the degree to which the average value of student attributes differ as a function of intervention or control group. When the exponent of the intervention effect regression estimate ($\hat{\beta}$) is taken, an *odds ratio* (OR) results. OR can be used as an effect size, where OR values of 1.68, 3.47, and 6.71 correspond to small, medium, and large effect sizes. (Chen et al., 2010). If there is perfect balance, OR will equal 1.0.

Propensity Scores and Weights. In order to generate the appropriate weights, a logistic regression model is estimated in which intervention status is regressed onto all study covariates. From this model, propensity scores are estimated representing the probability that an individual with a given covariate vector belongs to the intervention group. Using the estimated propensity score and the observed intervention status (Int.Status) for each individual, weights for individual i can be generated (see below) that corresponds to the estimand of interest: the *average treatment effect on the treated* (ATT).

$$ATT_i = \frac{\text{Int. Status}_i}{1} + \frac{(1 - \text{Int. Status}_i) * (PS_i)}{(1 - PS_i)}$$

When estimating the ATT individuals in the intervention group (Int.Status = 1) are all given a weight of 1. On the other hand, since individuals with larger propensity scores are more likely to be in the intervention group, the comparison group case with higher propensity scores (i.e. those that are more similar to their intervention counterparts) receive larger weights. For instance, an individual with a propensity score of 0.8 would get an ATT weight of 4 whereas an individual with a PS of 0.4 will be given an ATT weight of 0.667.

Re-evaluate Bias. To assess the reduction in bias, we estimated separate weighted logistic regressions in which study covariates were regressed onto intervention status, using the ATT weights. By utilizing these weights, it is possible to determine the degree to which bias has been reduced by allowing some comparison students to be more influential than others. After we achieved satisfactory balance on the study covariates, weighted regression models were estimated for each of the outcome variables. These regression models also included all study covariates.

Matching. Matching is a preprocessing approach that helps facilitate causal claims. By utilizing matching in addition to regression adjustment the causal claims resulting from a statistical model are doubly robust and likely will not result in bias (Ho et al., 2011). Possible approaches to matching are one-to-one and one-to-many matching in which each intervention student is matched with one or more than one comparison student, respectively. In fact, omitting observations can help reduce bias when there are comparison students that are very dissimilar from all students in the intervention group. Due to the nature of matching methods (i.e., the outcome variable never utilized) it is appropriate to investigate many matching methods to determine which method best achieves the dual goals of: (a) ensuring the greatest balance between groups and (b) maximizing the precision of the estimate of the ATT

Assessing Balance. Balance is assessed in the same manner as when propensity scores are used as weights. Using the full sample, initial differences between intervention and control groups with respect to the covariates is investigated. After matching, these differences are re-estimated using the matched sample. The difference in these estimates represents the percent improvement in balance. Improvement in balance was also assessed by generating QQ plots for both the unmatched and matched sample. We elected

to generate a one-to-one matched sample using the nearest neighbor approach available in the MatchIt (Ho et al., 2011) R package.

Results

Results are presented in two parts: (a) propensity score weighting, and (b) propensity score matching. Within each part, the effect on study outcomes academic probation and GPA are described.

Propensity Score Weighting

Due to observed missing values on the minority covariate, 18 observations were removed from the comparison group prior to conducting the analyses, leaving an overall sample size of 271 (comparison: $n = 225$; intervention; $n = 44$).

Initial Bias. A total of seven logistic regressions were estimated to investigate initial bias. With respect to student demographics, we found that intervention status had an effect on gender, specifically, Males were estimated to be 7.84 times more likely in PMP ($\hat{b} = -2.06$, $SE = 0.54$, $p < 0.001$; $OR = 7.84 = [1/0.13]$). Whereas, intervention status did not have an effect on minority status ($\hat{b} = -0.48$, $SE = 0.51$; $OR = 0.62$).

With respect to disability categories, we found that those diagnosed with ADHD were 4.76 times more likely to be in PMP ($\hat{b} = 1.56$, $SE = 0.35$, $p < 0.001$; $OR = 4.76$), while those diagnosed with ASD were 9.77 times more likely to be in PMP ($\hat{b} = 2.28$, $SE = 0.44$, $p < 0.001$; $OR = 9.77$). The other disability diagnoses such as LD ($\hat{b} = 0.37$, $SE = 0.33$; $OR = 1.45$) and Mental Health ($\hat{b} = 0.03$, $SE = 0.37$; $OR = 1.02$) were non-significant. With respect to those with multiple diagnoses (i.e., comorbidity) they were found to be 2.85 times more likely to be in PMP ($\hat{b} = 1.05$, $SE = 0.33$; $OR = 2.85$).

Generating Weights. Intervention status was regressed onto all study covariates in order to utilize the model predicted probabilities (i.e., propensity of a student being enrolled in PMP) to generate an ATT weight for each student. Using the aforementioned formula, the intervention group had a mean of 1 with standard deviation of 0; whereas, the comparison group had a mean of 0.21 and a standard deviation of 0.57 on the ATT weight variable.

Re-Assess Balance. Using the ATT weights generated, we estimated weighted logistic regressions to investigate whether or not bias was reduced on the study covariates. We found that Males were 1.16 times more likely to be enrolled in PMP ($\hat{b} = -0.15$, $SE = 0.71$, $p = 0.836$; $OR = 0.86$), while minority status remained non-significant ($\hat{b} = 0.03$, $SE = 0.69$, $p = 0.96$; $OR = 1.03$). With respect to diagnoses, we

found the effect of intervention status on ADHD ($\hat{b} = -0.15$, $SE = 0.47$, $p = 0.75$; $OR = 0.86$) and ASD ($\hat{b} = -0.13$, $SE = 0.44$, $p = 0.77$; $OR = 0.88$) to be non-significant; while the other disability categories remained non-significant. Finally, the effect of intervention status on multiple diagnoses was found to be non-significant ($\hat{b} = -0.15$, $SE = 0.43$, $p = 0.74$; $OR = 0.88$). Upon these nil findings, bias was satisfactorily reduced using the ATT weights generated. Table 2 shows estimates from both the unweighted and weighted logistic regressions for all study covariates.

Academic Probation. For the unweighted model, we estimated a logistic regression in which academic probation was regressed onto intervention status and all study covariates. We found the conditional log-odds of the intervention effect to be significantly different from 1.0 at the 0.1 level ($\hat{b} = -1.073$, $SE = 0.55$, $p = 0.0504$; $OR = 0.34$). Among the covariates, the conditional log-odds for gender ($\hat{b} = -1.07$, $SE = 0.44$; $OR = 0.34$) and ADHD ($\hat{b} = 1.14$, $SE = 0.44$; $OR = 3.11$) were significantly different from one. For the weighted model, using the ATT weights, the logistic regression was re-estimated to evaluate an unbiased estimand of the effect PMP has on academic probation. Upon fitting this model, we found the effect of PMP to remain non-significant ($\hat{b} = -0.86$, $SE = 0.58$; $OR = 0.42$), as were all study covariates.

Grade Point Average. For the unweighted model, after estimating a linear regression in which GPA was regressed onto intervention status and all study covariates, we found that the effect of PMP was non-significant ($\hat{b} = -0.11$, $SE = 0.13$, $p = 0.394$), therefore, controlling for demographics and diagnoses, those in the PMP do not perform better than their counterparts. The model implied mean GPA for those not enrolled in the PMP (e.g., Caucasian Males) was estimated to be 3.03 on average ($\hat{b} = 3.03$, $SE = 0.09$, $p < 0.001$). Regarding the performance of study covariates, Females were estimated to have a higher conditional GPA on average than Males ($\hat{b} = 0.38$, $SE = 0.09$, $p < 0.001$); whereas, those diagnosed with ADHD ($\hat{b} = -0.56$, $SE = 0.11$, $p < 0.001$), LD ($\hat{b} = -0.26$, $SE = 0.11$, $p < 0.05$), and Mental Health ($\hat{b} = -0.34$, $SE = 0.13$, $p < 0.01$) were estimated to have a lower GPA on average. All other covariates were non-significant.

For the weighted model, by employing the ATT weights, the population estimate for the PMP remained non-significant ($\hat{b} = 0.01$, $SE = 0.10$, $p = 0.92$). After weighting, the expected GPA for those in the comparison group in the reference categories (e.g., Caucasian, Male) was estimated to be 3.21 ($\hat{b} = 3.21$, $SE = 0.14$, $p < 0.001$). With respect to study covariates, the effect of ADHD ($\hat{b} = -0.81$, $SE = 0.14$,

$p < 0.001$) and LD ($\hat{b} = -0.38$, $SE = 0.14$, $p < 0.001$) remained significant; whereas, the effect of ASD and gender were non-significant.

Matching

Due to restricting the sample to Caucasian Males, a total of 144 observations (comparison $n = 109$; intervention $n = 35$) were available for the purposes of creating a matched sample. When using the nearest neighbor approach to identifying a matched sample, we settled on the greedy mechanism, whereby each intervention student is matched with the single best comparison (i.e., the shortest distance – on the logit scale) student. This effort resulted in analytic sample of 70 students equally split ($n = 35$, each) between comparison and intervention groups.

Percent Balance. In order to determine the performance of the matching procedure, the mean difference on the study covariates between groups are estimated separately using both the unmatched and matched sample. If the matching procedure performed well, it is expected these estimates will become smaller on an absolute scale. We found that the largest percent reduction occurred for the Other disability category (91.07%), whereas, the smallest percent reduction occurred for the ASD disability category (30.02%). In sum, the mean percent reduction was 75.76 ($SD = 25.81$). Table 3 shows the percent reduction estimates.

Academic Probation. After the reduction in bias in the study covariates, the effect of PMP remained non-significant ($\hat{b} = -0.65$, $SE = 0.61$, $p = 0.289$) leading to a conditional odds of 1.91. All other study covariates were non-significant.

Grade Point Average. Upon regressing GPA onto intervention status and all study covariates, we found that those in the comparison group with a Mental Health disorder were expected to have a GPA of 2.56 ($\hat{b} = 2.56$, $SE = 0.38$, $p < 0.001$) on average. All other terms in the model, including intervention status, were not significantly different from zero. Therefore, we find that students in PMP do not have, on average, higher GPAs than their counterparts ($\hat{b} = -0.15$, $SE = 0.22$, $p = 0.511$).

Discussion

Currently, what is known about college students with disabilities and peer mentor programs is mostly descriptive and qualitative in nature. While there is some emerging evidence to show the promise of effectiveness (Brown et al., 2010), evidence of effectiveness based on causal inference of such programs is largely absent from the higher education literature.

The current study sought to address this gap in the literature by applying propensity score weighting and matching methods to extant data in order to compare students who participated in a peer mentor program with their peers with disabilities who elected not to participate. Importantly, this approach demonstrates the possibility of designing a rigorous enough study so that causal inference can be determined but without the need to randomly assign participants into treatment and control groups, a feat that may seem close to impossible in applied research settings.

The results of the current study show no significant effects of peer mentoring on academic achievement and standing using both weighting and matching methods. This finding is contrary to a previous experimental study on the effects of peer mentoring on similar academic outcomes (Rodger & Tremblay, 2003). Despite this difference, there are generally very few experimental studies that examine the effects of peer mentoring on academic achievement. As such, it is not surprising to find mixed results, which further demonstrates the need to prioritize peer mentor studies in higher education settings. Interestingly, we found that intervention group students had a statistically significantly higher number of accommodations available to them. Further investigation of this finding was outside of the scope of the current study; however, this finding suggests that peer mentor program participants may be better connected with the campus disability services office, and simply may have more knowledge of and a tendency to use available supports.

While the results of this study show little effects on academic outcomes, further investigation of important non-academic outcomes are needed to better understand and clarify the utility and potential benefits of such programs. For example, previous study findings showed that peer mentored students with both high and low levels of anxiety achieved comparable grades; whereas, in the control group, students with high anxiety performed worse than those with low anxiety (Roger & Tremblay, 2003). Further, in other non-experimental studies, students not receiving peer mentoring also experienced decreases in self-esteem, and perceived social support, (Collings et al., 2014; Hryciw et al, 2013.) Peer mentored students in this program also indicated experiencing higher levels of integration into the university, whereas, students who did not work with a mentor were four times as likely to indicate wanting to leave the university (Collings et al., 2014). While mentoring programs seem to produce potential benefits for a general student population, their effects may be even more pronounced for specific subpopulations of students.

Limitations

A major limitation to consider in the interpretation of the current study findings is the sample size. The sample was small and limiting, taken from a private four-year college, and based on the students who decided to register with the campus office of disability services and voluntarily participated in the PMP. Among the sample, the participants in the PMP were primarily white males. As such, findings should not be generalized but should be considered in the design of future studies involving campus peer mentor programs. Specifically, even though this study was limited to a single institution, the concept of applying propensity score weighting and matching was demonstrated and potentially could be applied to multi-institutional studies on a much larger scale.

Another important limitation to consider is the approach we took to determining the outcomes for intervention and comparison students. Due to the nature of the data, we had to make decisions about how to treat probation status and GPA that was slightly different between groups (see p. 148). In future studies, these are critical decisions that should be carefully considered with regard to the generalizability of the findings.

Implications for Research and Practice

The results of this study highlight the fact that success of peer mentor programs may not be measured by short term academic variables (GPA and academic probation status) alone. In light of these results, along with previous research in college peer mentor programs, higher education professionals involved in these programs should make intentional decisions about data collection at the beginning, during, and end of a student's experience in the peer mentor program. Also, it is important to consider collecting non-academic data that is potentially more proximal in nature so that academic and nonacademic benefits of peer mentor programs can be clarified. Finally, our post hoc findings on accommodation use were informative and suggest that intervention students were more informed of available supports than those who did not participate in the PMP. Further exploration as to how peer mentor and other types of formal and informal supports affects accommodation use is warranted. It may also be beneficial to consider disability type as well as mentor-mentee relationship dynamics and mentor training in future studies as contributing factors.

With regard to non-academic data collection, self-report surveys may be a viable strategy. For example, programs may consider utilizing self-determination assessments to explore growth in areas such as advocacy, goal setting, or self-efficacy.

While research in self-determination in higher education settings is limited, high school students who are self-determined are more likely to experience favorable post-school outcomes (Shogren et al., 2015; Wehmeyer & Palmer, 2003). Further, the Association for Higher Education and Disability (AHEAD) recommends encouraging the development of self-determination skills in postsecondary students with disabilities. The Self-Determination Inventory: Student Report Version (SDI-RS) measures self-determination skills for students ages 18 through 22, with and without disabilities (Shogren et al., 2017) and could be an important tool to measure critical nonacademic skills of students in a peer mentor program.

Ultimately, college peer mentoring programs could be a viable support for SWD, but we know very little about the effectiveness of such programs. This study suggests a promising method of program evaluation where extant data obtained from a university data warehouse is utilized to better understand program effects on short-term academic outcomes. While the current study showed no significant effects of the mentor program on academic outcomes, the results inform the higher education literature on next steps to take as far prioritizing research on peer mentor programs, including data collection of proximal non-academic skills, careful attention to mentor-mentee pairing and mentor training, and coordinated efforts from multiple campus personnel across units in Student Affairs, Disability Services, Institutional Research, and faculty who aim to establish research lines in higher education and disability.

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Table 1*Sample Characteristics*

	Comparison	Intervention	Overall
<i>n</i>	241	46	287
Gender			
Male	58%	91%	63%
Female	42%	9%	37%
Race			
Caucasian	87%	91%	88%
African American	5%	3%	5%
Asian	3%	3%	3%
Other	1%	3%	1%
Multiracial	4%	-	3%
Ethnicity			
Non-Hispanic	9%	92%	91%
Hispanic	10%	8%	9%
Disability			
ADHD	34%	72%	40%
LD	38%	48%	39%
Mental Health	28%	26%	28%
ASD	5%	33%	9%
Other	37%	4%	32%
*Comorbid	34%	61%	39%
Number of Accommodations Mean (SD)	3.39 (2.12)	4.24 (2.25)	3.52 (2.16)

*Indicates multiple disability categories observed.

Table 2*Assessment of Covariate Balance - PSW*

Response Variable	Unweighted OR	Weighted OR
Male	7.84*	1.16
Minority	0.618	1.03
ADHD	4.763*	0.86
LD	1.451	0.79
Mental Health	1.029	1.24
ASD	9.773*	0.88
Comorbidity	2.846*	0.88

* Indicates the log-odds were greater than 1.

Table 3

Percent Reduction in Group Mean Difference

	Group Mean Difference
Distance	63.701
ADHD	85.160
ASD	30.016
Other	91.073
Comorbid	90.082
No. Accommodations	82.465

Autonomy Supportive Classrooms and Wellbeing in College Students with Psychiatric Disabilities

Amber O'Shea¹
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Abstract

Research has shown that students' experiences of autonomy within the classroom impact important outcomes related to student engagement, academic success, and wellbeing. Very little is known, however, about this relationship among students with psychiatric disabilities in postsecondary settings. Given the increasing number of students entering higher educational institutions with a psychiatric disability, and the increased risk this subpopulation of students has for experiencing issues related to health, wellbeing, and participation, research that further investigates the relationship between classroom experiences of autonomy and wellbeing among college students with psychiatric disabilities is warranted. The purpose of the current study was to examine the relationship between perceived support for autonomy in the college classroom and indicators of health and wellbeing among college students with psychiatric disabilities. Findings indicate that increases in perceived autonomy support in the classroom predicted higher levels of quality of life and recovery, and lower levels of distress from psychiatric symptoms. Implications for research and practice are discussed.

Keywords: autonomy, college students with disabilities, health, well-being

Issues pertaining to mental illness among college students today are wide-spread and pervasive. The number of postsecondary students in the United States who have been diagnosed with one or more mental illnesses continues to rise (Anastopoulos et al., 2016; Auerbach et al., 2016; Belch, 2011; Kampsen, 2010; MacKean, 2011), and researchers estimate that students with psychiatric disabilities currently make up one of the largest and fastest growing groups of students with disabilities who are enrolled in colleges and universities across the United States (GlenMaye & Bolin, 2007; Kupferman & Schultz, 2015). Despite the presence of campus-based services aimed at providing support to students with mental illnesses and disabilities, such as campus counseling centers and university offices of disability support services, students with psychiatric disabilities often experience issues related to health, wellbeing, and academic achievement, as evidenced by low levels of integration and persistence in higher education among this population (Collins & Mowbray, 2005; Goodman,

2017). For instance, research has shown that, while enrolled in institutions of higher education, students with psychiatric disabilities are less likely to fully participate in the campus community (Salzer, 2012); this has important implications for overall wellbeing, as research has found that low levels of involvement, engagement, and participation with the campus community can undermine students' educational and health trajectories (Burke-Miller et al., 2006; LaCaille et al., 2011; Rosenbaum et al., 2014; Visser & Hirsch, 2014; Von Ah et al., 2004). In general, individuals with psychiatric disabilities often face a number of barriers related to educational and occupational pursuits, as well as health and functioning, despite expressed motivation and desire to succeed in these domains (Hartley, 2010; Mancini, 2007).

In addition to the presence of psychiatric symptoms, it is likely that a number of social determinants of health - those presented within the socio-cultural contexts in which individuals live and work - negatively impact the health and wellbeing trajectories

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of individuals with psychiatric disabilities. Evidence indicates that individuals with psychiatric disabilities are at an elevated risk of comorbidity, mortality, and engagement in unhealthy or risky behaviors (Pratt et al., 2013). Two particularly relevant outcomes related to health and wellbeing among individuals with psychiatric disabilities are recovery and quality of life, which have been described as complex constructs that involve a dynamic interplay between personal, environmental, and contextualized factors (Mancini, 2007; Pinkney et al., 1991). Recovery, which is often studied as an important health-related outcome among individuals with psychiatric disabilities, describes feelings of hopefulness, meaning, and illness management (Mancini et al., 2005). Personal empowerment and a sense of agency in one's life are central to the notion of recovery (Mancini et al., 2005). Not only do recovery and quality of life have important implications for overall functioning, health, and wellbeing, but also have a negative impact on academic functioning and success among postsecondary students (MackKean, 2011). For individuals with psychiatric disabilities in postsecondary settings, the development of maladaptive health behaviors (i.e., physical inactivity, poor nutritional habits, problematic sleep patterns), poor behavioral and emotional regulation, and self-defeating habits may further impede overall health and function (Hicks & Heastie, 2008; Visser & Hirsch, 2014). For many students, adapting to new challenges and stressors presented in the college context can undermine health and wellbeing. For instance, students often face myriad stressors related to new academic demands, social roles, and pressures related to selecting and pursuing professional goals, which may influence student health, wellbeing, and quality of life (Beiter et al., 2015; Fier & Brzezinski, 2010).

It may be particularly challenging for students with psychiatric disabilities, in comparison to their peers, to develop the necessary balance between self-care and work towards addressing newfound independence, professional, and social challenges, as they are charged with navigating through new systems of health-care, advocating for needs and accommodations on campus, and managing symptoms of the disability and side-effects of medication. Moreover, as the college years often provide young adults with their first experiences of autonomy and behavioral independence to make meaningful decisions that reflect endorsed identities, students with psychiatric disabilities often must grapple with decisions related to disclosure of their disability to individuals at their college or university, which can be a complex process. Research has shown that, among college stu-

dents with invisible disabilities, students' decisions to disclose their disability to the university and make effective and appropriate use of campus-based support services relates to students' sense of self-determination and identity, which are developed through experiences afforded to them within the college context, such as interactions with peers, professors, and university staff (O'Shea & Meyer, 2016). Thus, for students with psychiatric disabilities, autonomy is a particularly important component of self-determined action related to proactive decision-making and wellbeing. Still, individuals with psychiatric disabilities often experience impairments that undermine motivated action and initiated behaviors, and are more likely to experience interactions with others in which their autonomy is often deemphasized (Mancini, 2008), leading to maladaptive decision-making and undermining health and wellbeing (Drake et al., 2010).

Research suggests that, for individuals with psychiatric disabilities, college may negatively impact health and wellbeing. While research has concluded that educational attainment and health are positively associated among individuals in the general population, this relationship is not as clear for individuals with psychiatric disabilities. A recent study conducted by O'Shea and Salzer (2019) found a negative relationship between level of educational attainment and indicators of quality of life and recovery among individuals with psychiatric disabilities. Results of this research revealed that, among adults with psychiatric disabilities, those who had been to college reported significantly lower indicators of wellbeing than those individuals with a high school education. One plausible explanation of these counter-intuitive findings is that experiences afforded within the college context may work to undermine recovery-oriented outcomes in individuals with psychiatric disabilities. For instance, research has suggested that highly controlling environments undermine identity exploration and negotiation which can compromise health and recovery, while autonomy-supportive practices facilitate self-determined action, recovery, and wellbeing (Hutcheon & Wolbring, 2012; Mancini et al., 2005). Based on these studies, it is clear that further research is needed to better understand the experiences of students with psychiatric disabilities in contexts of higher education and how these experiences impact outcomes related to health and wellbeing.

Traditional-aged college students are often in an important developmental period between late adolescence and early adulthood, engagement in health-related behaviors has important implications for overall and long-lasting health and wellbeing (Nelson et al.,

2008). Experiences during the college years can impact long-term health outcomes, as the habits formed during late adolescence and emerging adulthood can lead to the development of health conditions later in life (LaCaille et al., 2011; Visser & Hirsch, 2014; Von Ah et al., 2004). Consequently, for college students with psychiatric disabilities, adopting negative health habits during this developmental period may further contribute to the disparities in health and employment frequently seen among adults with psychiatric disabilities (Burke-Miller et al., 2006; Rosenbaum et al., 2014). As such, it is imperative to develop a better understanding of the malleable factors in the college context that impact health and wellbeing among college students with serious mental illnesses. More students are entering college with psychiatric disabilities than ever before (Blanco et al., 2008), it is urgent that research identifies effective, affordable, and scalable lifestyle interventions that promote the development and maintenance of health and wellbeing among college students with psychiatric disabilities. An important step in this direction is to establish a necessary knowledge-base of the unique characteristics inherent in students' experiences in higher education that impact health and wellbeing.

Support for Student Autonomy

One critical factor that contributes to success and recovery among individuals with psychiatric disabilities involves support for autonomy. Among individuals with psychiatric disabilities, autonomy has long-been identified as an essential component of rehabilitation and treatment. Autonomy, which is considered a basic psychological need, involves developing a sense of agency, intrinsic motivation, and self-determination towards actions and goals (Deci & Ryan, 2008). Support for autonomy, which involves the development of a sense of personal agency, self-initiated action, and decision-making (Drake et al., 2010), has been found to be an important element of recovery-oriented programs, and evidence suggests that supporting individuals' sense of autonomy and autonomous decision-making and actions results in improved outcomes related to recovery, quality of life, and psychiatric symptoms (Mancini, 2007). Thus, support for individual autonomy is a predictor of recovery and wellbeing in individuals with psychiatric disabilities; however, structures vary significantly in the extent to which they support and foster individuals' sense of autonomy. Autonomous behavior is intrinsically motivated, while controlled behaviors are enacted under the pressure of external figures (Deci & Ryan, 2002). In the classroom, students' autonomy can be supported by instructors

who create student-centered learning environments, provide information and opportunities for informed decision-making, acknowledge students' attitudes and identities, and encourage identity exploration and problem solving while avoiding coercion (Black & Deci, 2000). Instructors who adopt student-centered approaches to teaching, such as prioritizing students' needs and avoiding coercive or demanding practices, were found to promote more positive outcomes related to learning and psychological development. According to self-determination theory, a theoretical framework of human motivation (Ryan & Deci, 2000), environments that support individuals' basic needs for autonomy are more likely to enhance intrinsic motivation, pro-active behaviors, and overall functioning. This theoretical framework is particularly well-suited for elucidating the malleable and socio-contextual factors present within the college context that impact student wellbeing, as the theory explicitly attends to the person-environment fit and the dynamic relationship between the level of support for autonomy in an environment and an individual's intrinsically-motivated action. Moreover, this theoretical framework has the potential to provide important insight about practices within higher education that support health and wellbeing in college students with psychiatric disabilities, as it brings to the forefront individuals' contextualized experiences within post-secondary settings.

Among individuals with psychiatric disabilities, contexts that support individual autonomy related to the development of personal agency and goals has been found to improve motivation towards personally meaningful work (Moran et al., 2014). Inclusion of individuals' identities is an important part of supporting autonomy. In particular, Moran et al. found that autonomy-supportive contexts value prior knowledge and lived experience with a mental illness, rather than stigmatizing these identities, which allowed individuals to "integrate illness experience and more normative parts of one's identity in a health way" (p. 39). This study, in combination with other prior research, show that autonomy as described by self-determination theory (Ryan & Deci, 2000), provides a suitable theoretical framework for elucidating and conceptualizing the experiences of individuals with psychiatric disabilities in various contexts, the extent to which socio-cultural environments are supportive or restrictive of individuals' autonomy, and the relationship these factors have on important outcomes related to health and wellbeing among individuals in this population.

Among educational researchers, perceived support for student autonomy in the classroom has long-been established as an important predictor of

successful outcomes in higher education (Ryan & Deci, 2000). Prior research has shown that instructors who are perceived by students as being more supportive of student autonomy in the classroom foster greater academic outcomes, engagement, and persistence (Black & Deci, 2000). In the classroom, teachers can support students' autonomy by avoiding coercive behaviors, emphasizing students' personal agency, and providing opportunities for students to make proactive decisions aligned with their personally endorsed identities (Niemi & Ryan, 2009). Autonomy support in the classroom reinforces student-centered learning, which is an approach to facilitate learning in which students assume primary ownership of their own learning processes, by providing students with opportunities to make decisions, develop a sense of agency, and engage in independent thinking and learning (Lee & Hannafin, 2016). Moreover, autonomy-supportive teachers construct student-centered learning environments by offering scaffolding to students' learning while supporting the development of student identity, interests, and goals. Among individuals with disabilities, research has found that authoritarian or paternalistic environments, which frustrate and undercut the need for autonomy, thwart recovery-related outcomes and goals (Mancini et al., 2005), and influence decision making regarding the use of available resources and services that are known to support successful postsecondary outcomes (O'Shea & Meyer, 2016).

While research has shown that autonomy-supportive environments foster health outcomes among individuals with psychiatric disabilities, and autonomy is an important component of recovery-oriented programs and those aimed at improving student outcomes, there remains a dearth of research on the extent to which perceived support for autonomy in the classroom promotes positive outcomes related to health and wellbeing among individuals with psychiatric disabilities in postsecondary settings. As the number of students with psychiatric disabilities on college campuses continues to increase, it is important that we develop a better understanding of the ways in which students' health, wellbeing, and educational trajectories are either supported or thwarted by factors within the educational environment. While it is clear that autonomy support plays a critical role in improving outcomes related to engagement, motivation, and wellbeing among students in the general population (Reeve, 2006), very little is known about these relationships among students with psychiatric disabilities in settings of higher education.

Given the increasing number of students entering higher educational institutions with a psychiatric dis-

ability, and the increased risk this subpopulation of students has for experiencing issues related to wellbeing and success, research is warranted that further investigates the relationship between classroom experiences of autonomy and wellbeing among college students with psychiatric disabilities. The purpose of the current study is to examine the relationship between perceived support for autonomy within the college classroom and indicators of wellbeing, namely recovery, quality of life, and distress from psychiatric symptoms, among college students with psychiatric disabilities.

Method

Human subjects approval for this study was obtained from the institution's IRB prior to participant recruitment. As part of a larger study on Supported Education, participants were recruited over a period of 18-months via the Internet from student-oriented websites, such as student-run mental health organizations, campus mental health organizations and services, e-news listservs, and websites operated by mental health organizations such as NAMI. Eligible participants were enrolled in either a two- or four-year college or university at the time of the study, for either full- or part-time study. Interested and eligible participants were mailed a release of information form for confirmation of mental health diagnosis and the IRB-approved consent form. Participants were offered a \$20 incentive for completing the baseline survey. Cross-sectional baseline data for all participants were used in the current analysis.

Measures

Demographic information was collected from each participant, including information about age, gender, ethnicity, relationship/marital status, employment status, and level of education. Additionally, participants were asked whether or not they lived independently, in their own domicile, in a shared domicile, or if they had ever experienced homelessness.

Participants' perceived recovery from mental illnesses was assessed with the 20-item version of the Recovery Assessment Scale (RAS). The items on the scale assess life goals and purpose, general outlook and attitudes, hope, not being dominated by symptoms, and asking for help. Each of the 20 items is rated on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). A composite RAS score ranges from 20 to 100 and is calculated by summing the 20 constituent items. Higher scores correspond to greater recovery. A comprehensive review of psychometric findings has found the RAS to have strong

evidence of reliability and validity for the targeted population (Salzer & Brusilovskiy, 2014).

To assess participants' quality of life, the 10-item version of Lehman's Quality of Life (QOL) measure was used. This measure, which was adapted from a longer version of Lehman's QOL interview, was developed to assess how individuals feel about important aspects of their lives in various areas (e.g., "How do you feel about the amount of fun you have?" "How do you feel about the way things are between you and your family?" and "How do you feel about the amount of friendship you have in your life?"), with responses ranging from 1 = terrible to 7 = delighted. The composite score was calculated by averaging the scores on all the items, with higher scores indicative of greater overall quality of life. The Lehman QOL questionnaire has demonstrated good validity and reliability and has previously been validated for use with individuals with serious mental illnesses (Lehman, Postrado, & Rachuba, 1993).

The Hopkins Symptoms Checklist (HSCL) is a 25-item measure, assessing the presence and intensity of depression and anxiety symptoms, as well as two somatic symptoms over the past month. Items were scored on a four-point Likert scale (1 ¼ not at all bothered to 4 ¼ extremely bothered), and a composite score is calculated as the average of the item responses, with lower scores indicating fewer symptoms. This 25-item measure has demonstrated reliability and validity for assessing symptoms among individuals with serious mental illnesses (Derogatis et al., 1974).

Perceived autonomy support was measured using the six-item version of the Learning Climate Questionnaire (LCQ), which measures students' perception of the level of support for their autonomy in classroom-based settings. Both the six-item and 15-item version of the LCQ have been found to have similar psychometric properties; thus, the shorter version was selected for use in the current study as efforts were taken to reduce the time for completion of the survey instrument. The LCQ can be adapted to assess support for autonomy in a particular class or to ascertain students' perceptions of the general learning climate and faculty members' support for their autonomy in general at their postsecondary institution. For the purposes of the current study, students were asked to reflect on their experiences overall with the instructors of their courses at the current postsecondary institution. This measure uses a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) on items such as "I feel that my instructor provides me choices and options" and "My instructor encouraged me to ask questions". Higher scores represent higher levels

of perceived support for student autonomy from faculty member at their institution. This scale has been previously validated and found to have good reliability and validity (Williams & Deci, 1996).

Results

Sample Description

Of the 70 participants surveyed, 17% were male, 77% were female, and 6% were transgender. The sample was 61% white, 7% black, 7% Latino/Hispanic, 1% Native American, 10% Asian, and 2% Other. Ninety percent of participants reported that they were single or never married at the time of completing the survey, and 10% were married or in a domestic partnership. Sixty percent of the sample reported that their sexual orientation was heterosexual, 4% Gay/Lesbian, 21% bisexual, and 14% other. Of the participants surveyed, 9% reported that they have children (biological, adopted, or step-children), and 91% did not have any children. Seventy percent of the sample was employed at the time of the survey and 29% were not employed. The mean age of the sample was 24 ($SD = 6$). For educational attainment, 11% of the sample successfully completed high school, 50% had completed some college, 16% completed an associate's degree, 10% completed a bachelor's degree, 7% completed some graduate school, and 6% completed a graduate or professional degree. Demographic characteristics of the sample are also presented in Table 1.

Autonomy Support and Quality of Life

A linear regression was run to understand the effect of perceived autonomy support (Haslam et al., 2009) within the classroom on quality of life among college students with psychiatric disabilities. Linearity was assessed via a scatterplot with a superimposed regression line of quality of life against perceived autonomy support (PAS). Visual inspection of these plots revealed a linear relationship. The assumptions of homoscedasticity and normality were met, as assessed by visual inspection of standardized residuals versus standardized predicted values. No outliers were detected via case-wise diagnostics. Correlations for all variables are presented in Table 2. PAS accounted for 9% of the variation in quality of life with an adjusted R square .08, which equates to a medium effect size. PAS in the classroom statistically significantly predicted quality of life $F(1,69) = 6.57, p = .013$. Results of the regression analyses are presented in Table 3.

Autonomy Support and Recovery

A linear regression was run to understand the effect of perceived autonomy support (Haslam et al., 2009) within the classroom on recovery among college students with psychiatric disabilities. Linearity was assessed via a scatterplot with a superimposed regression line of recovery against PAS. Visual inspection of these plots revealed a linear relationship. The assumptions of homoscedasticity and normality were met, as assessed by visual inspection of standardized residuals versus standardized predicted values. No outliers were detected via case wise diagnostics. Perceived autonomy support accounted for 12% of the variation in recovery with an adjusted R square .13, which also equates to a medium effect size . Perceived autonomy support in the classroom statistically significantly predicted recovery $F(1,69), = 10.28, p = .002$.

Autonomy Support and Psychiatric Symptoms

A linear regression was run to understand the effect of perceived autonomy support (Haslam et al., 2009) within the classroom on psychiatric symptoms among college students with psychiatric disabilities. Linearity was assessed via a scatterplot with a superimposed regression line of recovery against PAS. Visual inspection of these plots revealed a linear relationship. The assumptions of homoscedasticity and normality were met, as assessed by visual inspection of standardized residuals versus standardized predicted values. No outliers were detected via case wise diagnostics. Perceived autonomy support accounted for 10% of the variation in symptoms with an adjusted R square .08. Perceived autonomy support in the classroom statistically significantly negatively predicted symptoms $F(1,69), = 7.35, p = .008$.

Discussion

The purpose of the current study was to investigate the relationship between students' perceived autonomy support in college classrooms and measures of students' subjective sense of wellbeing, including their quality of life, recovery, and psychiatric symptoms. A large body of literature shows that support for autonomy yields positive outcomes for students in educational contexts (Ciani et al., 2010; Reeve, 2009; Stefanou et al., 2004), and for students with learning disabilities (Field et al., 2003); however, research had not yet explored this relationship among postsecondary students with psychiatric disabilities. Results of the current study show that students' perceived support for autonomy in the classroom is positively associated with quality of life and recovery, and neg-

atively associated with symptoms among college students with psychiatric disabilities. The results of this study provide important insight into the nature of the relationship between students' perceptions of support for their autonomy and pertinent outcomes related to their health and wellbeing.

Prior research has explored the effects of autonomy on a number of factors related to success in general student populations. In particular, research has found that when teachers support student autonomy, students are more likely to report feeling a sense of personal wellbeing and belonging in the classroom, are more likely to actively engage in prescribed learning activities, and are more engaged in tasks that require higher-order thinking (Stefanou et al., 2004). Moreover, students who perceive the classroom environment to be supportive of their autonomy have been found to have a better sense of community within the classroom (Solomon et al., 1996), improved relationships with peers (Ruzek et al., 2016), and increased academic achievement (Marshik et al., 2017). On the other hand, classroom structures which are perceived by students as controlling or rigid, in which students feel pressured to think, behave, and respond in specific ways in order to succeed in the classroom context, have been found to undermine students' motivation, well-being, and academic outcomes (Garcia & Pintrich, 1996; Reeve, 2009). The findings of the current study lend further support to previous research that highlights the important role of support for students' motivated decision-making, self-determination, and autonomy. In this case, outcomes related to the health and wellness of students with psychiatric disabilities were found to be associated with perceived autonomy in the educational environment.

Prior research has focused on the importance of autonomous motivation among college students with disabilities, and found that students with disabilities who feel that their autonomy is supported in the college context are more likely to make proactive decisions aligned with their personal and professional goals (Field et al., 2003). In particular, among college students with disabilities, perceiving the college environment as supportive of student autonomy was essential in priming students' identity, self-determination, and motivation to use campus-based disability support services in an effective and proactive way (Field et al., 2003; Hadley, 2007; O'Shea & Meyer, 2016). Students with psychiatric disabilities may face unique stressors related to stigma, health and well-being, and belonging in higher education (Condra et al., 2015). Identifying factors related to successful outcomes among students with psychiatric disabilities is an imperative step towards supporting successful and

health trajectories among this growing subpopulation of students.

For individuals with psychiatric disabilities, the role that autonomy plays in promoting recovery and quality of life has been demonstrated, as research has shown that individual autonomy supports positive outcomes related to recovery. Specifically, research suggests that recovery-oriented programs that are perceived as supportive of individuals' autonomous decision-making are more likely to foster personal recovery, a sense of personal agency, and meaningful participation in community structures (Drake & Whitley, 2014; Mancini et al., 2005). Moreover, individuals' engagement and performance in various environments such as work, community participation, and treatment programs, are improved when people perceive the environment as being supportive of their need for autonomy (Mancini, 2008). Mancini (2008) argues that autonomy support is perhaps the most important component of a recovery-oriented environment, as it is a vital component of personal well-being, and because many individuals with psychiatric disabilities have previously experienced encroachments on their personal sense of agency, autonomous decision-making, and initiation of goal-directed behaviors. Thus, the findings of the current study, which suggest that perceived autonomy support in the classroom are positively predictive of recovery and quality of life, and negatively predictive of distress caused by psychiatric symptoms, are congruent with research on the role of autonomy support in recovery contexts for individuals with psychiatric disabilities.

The study has a few limitations that are worth noting. First, the use of a cross-sectional design precludes the ability to attribute causation. Future studies should attempt to further investigate the impact of autonomy support in classroom settings in promoting positive outcomes related to health and well-being in college students with psychiatric disabilities using experimental or quasi-experimental designs. Additionally, while a strength of the current study was the utilization of standardized survey instruments that have been previously validated for use with individuals with psychiatric disabilities, survey methodologies are limited in their ability to yield rich in-depth responses regarding participants' meaning making. As the current study yields important insight into individual's experiences related to the objective experience of autonomy-supportive contexts and personal recovery, future research would benefit from taking a qualitative approach to gaining in-depth, rich information pertaining to how students with psychiatric disabilities construct meaning surrounding contextual support for their

autonomy, and their personally meaningful goals for recovery and sense of well-being.

Implications for Research and Practice

The findings of the current study provide new insight into the role of perceived autonomy support in the college classroom for supporting important outcomes related to health and wellbeing among college students with psychiatric disabilities. These results suggest that supporting students' needs for autonomy in the academic environment may have an impact on positive health-related outcomes. Central practical implications of the current findings involve improving the physical and mental health outcomes among college students with psychiatric disabilities by adopting practices and policies that foster autonomy-supportive classroom environments that will also benefit all students. Efforts should be made to identify specific strategies for supporting autonomy, agency, and engagement among students. Specifically, efforts should be increased to improve collaborative networks with those who interact with and provide services to college students with psychiatric disabilities. Initiatives should focus on working collaboratively with practitioners and staff within educational environments to support students' efforts to establish personal agency, personally meaningful goals related to educational attainment and occupational success, and motivated decision making among students with psychiatric disabilities. Additional attention should be paid to the systemic structures within academia in order to better understand how the culture of higher education and experiences of students outside of the classroom contribute to or thwart students' sense of autonomy. Additional research of this nature is needed to lay a necessary foundation of knowledge for the development of targeted interventions aimed at improving outcomes related to well-being in college students with psychiatric disabilities.

Prior research has found that paternalistic, or highly controlling environments, can lead individuals with psychiatric disabilities to feel silenced and discredited, while autonomy-supportive environments enhance self-efficacy and well-being (Schauer et al., 2007). Some researchers have contended that the deleterious effects of medical paternalism on individuals with psychiatric disabilities can create a form of iatrogenic injury, where controlling treatments impede recovery and result in poorer health outcomes (Mancini, 2007). The results of the current study lend additional support to the extant research on autonomy-supportive practices for individuals with psychiatric disabilities, and underscore the importance of avoiding coercive, controlling, or paternalistic behav-

iors when working with college students with psychiatric disabilities. Wherever possible, faculty and staff should prioritize and elevate students' choices and work closely with students to embolden them to make decisions about their disability in the context of postsecondary education. Efforts should be made to create spaces in which students' emergent identities are valued, and information should be provided in a way that promotes proactive discovery and informed decision-making. For instance, faculty and staff can work with students with psychiatric disabilities to help them better understand and communicate the barriers to success they might face in higher education, as well as their own unique strengths and needs in the context of college classrooms and environments. Moreover, faculty and staff should assist students in discovering, locating, and accessing resources on campus that are well-aligned with their personal goals and interests.

College and university faculty can create autonomy-supportive classrooms by adopting practices that are flexible and promote students' motivated engagement. These practices are well-aligned with principles of universal design, which involve being flexible with the classroom structure and the presentation of material, allowing for flexibility in students' expression and demonstration of knowledge, and encouraging engagement and the development of intrinsic motivation towards tasks in the classroom (Hall et al., 2012). For students with disabilities, studies have shown that students' perceptions of faculty flexibility impact the likelihood that the student requests and makes use of academic accommodations (Goodman, 2017), thus, upholding these principles may be particularly important for supporting positive outcomes among students with psychiatric disabilities. Notably, Black and Deci (2000) found that students who are relatively low in initial autonomy are more likely to benefit from autonomy-supportive instructors, signifying that those students who are most likely to struggle with feeling autonomous are likely to gain the most from autonomy-supportive instructors. These findings are of chief relevance to students with psychiatric disabilities, as research suggests individuals with psychiatric disabilities are at an increased risk of developing maladaptive patterns related to autonomous self-regulation and motivation, and are more likely to have had prior experiences with controlling figures in the past (Mancini, 2007). Thus, while all students generally benefit from autonomy-supportive instruction, students who are at risk for experiencing lower levels of autonomy, such as those with psychiatric disabilities, are likely to further benefit from learning in autonomous-oriented contexts.

A critical component of providing support for autonomy involves supporting individuals in making informed choices that are congruent with their personal interests, identities, and goals (Field et al., 2003; Ryan & Deci, 2002; Stone et al., 2008). As such, faculty and staff should allow students to behave in ways that reinforce their identities and personal choices, by encouraging identity exploration and negotiation in the academic environment. Drake et al. (2010) assert that "real choice is predicated on having access to information" (p. 8). Thus, in order to create and maintain autonomy-supportive environments in postsecondary settings, it is critical that disability service providers, staff, and educators provide students with pertinent information about available accommodations on campus and the types of options and avenues students have for seeking assistance and support. Disability support staff who adopt autonomy-supportive practices can help students develop the tools and resources needed for success, while providing ample opportunities to discuss their ideas, interests, goals, and the challenges they face in pursuit of their educational and professional goals. Prior research has found that students' lack of knowledge about their disability in the context of higher education is a barrier to success (Goodman, 2017; Kranke et al., 2013). Hence, arming students with knowledge and information germane to college and career planning will help students construct a personally meaningful understanding of their disability and campus-based support services, and ultimately promote autonomy.

Providers of disability support services have the opportunity to educate and support students in the development of skills related to self-advocacy and self-regulation. Students with psychiatric disabilities are likely to benefit from having individual discussions with faculty and staff about their unique needs and experiences, the types of services and accommodations available and accessible to them, how services align with and support their individual goals, and the ways in which services and accommodations have or have not been perceived by their peers as being helpful in the past. These types of conversations help to enhance a sense of autonomy among students by enhancing and developing cognitive and motivational processes related to self-regulation, self-assessment, and decision-making (Niemic & Ryan, 2009). As students learn to navigate the academic environment of postsecondary education, their understanding of their own academic strengths and limitations change and evolve. Working with students to encourage this type of discovery and exploration, while scaffolding support, empowers students' sense of agency and autonomy and promotes well-being and development.

Finally, faculty and staff at postsecondary institutions across the United States would benefit from additional education and training concerning the importance of adopting autonomy-supportive practices and avoiding controlling practices when working with students with psychiatric disabilities. Research has shown that a general lack of understanding of mental health issues presents a pervasive barrier for the success of college students with psychiatric disabilities (Condra et al., 2015). Enhancing faculty and staff awareness of issues pertaining to students with psychiatric disabilities is paramount. As the number of college students with psychiatric disabilities continues to increase it is vital that faculty and staff continue to develop a better understanding of the unique needs and experiences of this group of students and learn more about ways to support their success and wellbeing.

Future research should focus on understanding the lived experiences of students with psychiatric disabilities in the context of higher education, and the characteristics of learning environments that shape, influence, and predict pertinent outcomes related to health, functioning, and wellbeing. Specific directions of future research should include investigations into other components of theoretically-oriented motivation, such as perceived support for the needs of competence and relatedness, and these factors' additional contributions to health and well-being among students with psychiatric disabilities. Research is also warranted that focuses on the relationship between recovery and other psychosocial factors, such as self-efficacy. Prior research has found that self-efficacy is an important contributory factor to recovery among individuals with psychiatric disabilities (Mancini, 2007), and may also be particularly important to the experiences of students in postsecondary education (Chemers et al., 2001). Thus, it is likely that the development of self-efficacy in college is related to positive postsecondary outcomes and health and wellbeing for students with psychiatric disabilities. Future research should investigate this possibility. Finally, more research is needed to identify the correlates of various contextual and sociocultural factors with outcomes related to academic achievement. As noted, the relationships between educational attainment, experiences within the educational context of college, and health and well-being among college students with psychiatric disabilities is somewhat complex. One line of future research might focus on the potential impact of psychiatric symptoms on students' perceptions of the classroom environment and their perception of opportunities to develop agency and autonomous regulation in the classroom, as it is plausible that students' perceptions

of their instructors' support for autonomy is shaped by symptoms and prior experiences in the classroom. Further research is warranted to better elucidate these relationships and the particular mechanisms at play. Additional research of this nature is needed to lay the foundation for the development of practices, policies, and classroom-based interventions aimed at supporting health, wellbeing, and academic success among college students with psychiatric disabilities.

Conclusion

The purpose of the current study was to investigate the relationship between students' perceived autonomy support in college classrooms and measures of health and wellbeing, including quality of life, recovery, and psychiatric symptoms. The results of the current study find that students' perceived support for autonomy in the classroom is significantly positively predictive of quality of life and recovery, and significantly negatively predictive of symptoms in college students with psychiatric disabilities. Not surprisingly, quality of life and recovery were negatively associated with psychiatric symptoms. The results of this study provide important insight into the nature of the relationship between students' perceptions of support for their autonomy and pertinent outcomes related to health and wellbeing among college students with psychiatric disabilities. Specifically, the results highlight the important role that perceived support for autonomy in the college classroom plays in promoting positive outcomes related to recovery, quality of life, and psychiatric symptoms among college students with psychiatric disabilities.

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Table 1*Participant Demographics*

Gender		N	Percent
	Male	12	17
	Female	54	77
	Other	4	6
Ethnicity			
	White	43	61
	Black	5	7
	Latino/Hispanic	5	7
	Native American	1	1
	Native Hawaiian	-	0
	Asian	7	10
	Other	1	2
Marital Status			
	Single/Never Married	63	90
	Married/Partnership	7	10
Education Level			
	High School/GED	8	11
	Some College	35	50
	Associates Degree	11	16
	Bachelor's Degree	7	10
	Graduate School	5	6
Employment Status			
	Employed	50	70
	Not Employed	20	29

Table 2*Correlations Between All Variables*

Measure	1	2	3	4
1. Autonomy	1			
2. Quality of Life	.297*	1		
3. Recovery	.362**	.665**	1	
4. Psychiatric Symptoms	-.312**	-.474**	-.591**	1

Note. * Correlation is significant at the $p < .05$ level (2-tailed);

** Correlation is significant at the $p < .01$ level (2-tailed).

Table 3

Simple Linear Regression Analyses for Perceived Autonomy Support in The Classroom Regressed on Quality of Life, Recovery, and Symptoms (N=70)

Dependent Variables	B	Beta	<i>t</i> -value	Significance	Confidence Interval	
Quality of Life	.322	.297	2.56	.013	.071	.573
Recovery	.029	.362	3.21	.002	.011	.048
Symptoms	-.536	-.312	-2.71	.008	-.931	-.142

Examining the STEM Climate for Queer Students with Disabilities

Ryan A. Miller¹
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Abstract

Increasing participation and success in science, technology, engineering, and math (STEM) fields continues to be a national imperative, with particular attention paid to eliminating barriers for women and underrepresented students of color. Some attention has been paid to the underrepresentation of students with disabilities in STEM fields, while few researchers have focused on the experiences of lesbian, gay, bisexual, transgender, and queer (LGBTQ) students in STEM. Literature about both students with disabilities and LGBTQ students suggest challenges and barriers that may prevent these groups from successfully persisting in STEM majors. This qualitative study examined the campus experiences of five queer students with disabilities in STEM fields at a predominantly white research university. Findings reveal that participants encountered male-centered, heteronormative STEM spaces, physical and social inaccessibility on campus, a lack of intersectional resources, and marginalization in and out of the classroom. We offer a holistic portrayal of students' higher education experiences and of their multiple identities, as students elaborated on their experiences and marginalization related not only to disability and LGBTQ identities, but also to gender, race, and ethnicity. The study offers one contribution to further exploration of the higher education experiences of students with multiple marginalized identities and presents ways that faculty and staff may seek to improve the classroom and overall campus environment for students.

Keywords: disability, LGBTQ, intersectionality, STEM, campus climate

Studies of science, technology, engineering, and math (STEM) learning environments have shown that they are less welcoming to students with minoritized identities than postsecondary learning environments as a whole (e.g., O'Brien et al., 2015; Stout et al., 2016). Most of this literature has focused either on the experiences of students of color or on the experiences of women students (e.g., Lord et al., 2009). Yet, the experiences of students with disabilities and lesbian, gay, bisexual, transgender, and queer (LGBTQ) students in STEM majors also point to experiences of marginalization, isolation, and misunderstanding (Linley et al., 2018). Students with disabilities are underrepresented in STEM fields (National Science Foundation, 2011) and strategies such as creating mentorship and coaching programs (Gregg et al., 2016; White & Massiha, 2015), implementing universal design in the classroom (Jenson et al., 2011), and allowing students to better identify their support needs (Dunn et al., 2012) may improve student experiences and outcomes. LGBTQ students may not feel

it is safe to disclose their gender identity and/or sexual orientation in STEM spaces (Linley et al., 2018), an experience shared by LGBTQ faculty and staff in STEM (Barres et al., 2017; Bilimoria & Stewart, 2009) that may create and enforce a culture of silence and invisibility around minoritized gender and sexual identities.

While there is cause for concern about the climate in STEM for students with disabilities and LGBTQ students, no published research on the intersections of these two populations —LGBTQ students with disabilities in STEM — was located, a gap we begin to fill with this study. The purpose of this study is to explore the experiences of self-identified queer students with disabilities as they navigate STEM majors and campus life at a predominantly white research university in the southern United States. The research question that guided this study is: How do queer students with disabilities majoring in STEM fields describe their collegiate experiences, both within and outside of STEM spaces? This question reflects that

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we explored students' perceptions of their experiences within their STEM majors and that we also find it important to contextualize these findings within students' broader collegiate experiences. The research question also reflects our holistic approach to exploring students' multiple identities; though disability and LGBTQ identities served as focal points of the study, students also shared their experiences related to gender, race, ethnicity, and other social identities and how they navigated compounding forms of marginalization.

Literature Review

To situate the present study, we briefly review some of the research related to college students with disabilities in STEM and the few studies about LGBTQ students in STEM.

Students with Disabilities in STEM

Researchers have explored the experiences of students with disabilities in STEM fields relative to topics including faculty, coursework, and mentoring. Faculty members — who possess rigorous training in their field, but little training on student development and how to work with students with disabilities — can significantly influence the experience for students with disabilities in and outside the classroom. Thurston et al. (2017) found that faculty “may have stereotypes about the capacity of students with disabilities to do STEM work” (p. 55) and proposed strategies such as implementation of universal design for learning techniques, professional development, and faculty learning communities to help overcome such perceptions. Universal design “focuses on eliminating barriers through initial designs that consider the needs of diverse people, rather than overcoming barriers later through individual adaptation” (Rose et al., 2006, p. 136) More, while universal design for learning “embeds accessible pedagogy into...the means of representing information, the means for students' expressions of knowledge, and the means of engagement in the learning” (p. 136). A universal design approach to designing accessible learning experiences with a diverse group of learners in mind from the start may be understood in contrast to the idea of providing individual accommodations for participation on a case-by-case basis.

A mixed methods study examining the teaching pedagogy within STEM classroom at community colleges found that faculty may lack formal knowledge of pedagogy and time for professional development (Moriarty, 2007). The study illustrates that STEM faculty have the desire to be inclusive in their teach-

ing but struggle to identify obstacles and interventions that may affect student success. Examining the National Longitudinal Transition Study data, Lee (2011) found that students with disabilities chose a STEM major at higher rates in comparison to students without disabilities but received fewer forms of support within STEM classrooms. The study also revealed that in comparison to the male cohort, female students with disabilities enrolled in STEM at much lower rates. Wei et al. (2014) found students with autism in STEM majors at community colleges had higher rates of retention and success due to high levels of transitional support, the ability to live at home, and greater flexibility. Students were twice as likely to transfer to a four-year institution in comparison to students with autism in non-STEM majors (Wei et al., 2014).

Students with disabilities report a chilly academic climate, but faculty can implement strategies to help ameliorate these problems and enhance students' self-efficacy. Love et al. (2014) found STEM faculty have trouble identifying and defining the needs of students with non-physical disabilities regardless of whether students disclose their disabilities within their classroom. When students feel supported in the classroom, their academic self-efficacy may increase. Jenson et al. (2011) reported that students with disabilities in STEM majors are more invested in their learning and have higher rates of self-efficacy and retention when they have hands-on learning in universally designed classrooms where faculty members build rapport with students and address questions. By implementing universal design, students of all levels of ability are able to successfully thrive in the classroom. Dunn et al. (2012) found that students in STEM fields who understood their disabilities and their needs of support were better able to ask for accommodations within higher education. When students are able to identify detailed areas of support or accommodation, they have higher rates of retention and a more enriched academic experience.

Positive one-on-one mentoring and coaching relationships can serve as a protective factor for students with disabilities within higher education, including within STEM majors. The relationships can serve as safety nets and sources of empowerment in chilly climates. White and Massiha (2015) evaluated transitional and mentoring programs provided to students with disabilities within STEM academic programs at the University of Louisiana Lafayette. The researchers demonstrated that one-on-one mentorship in addition to targeted transitional support increases rates of first-year student retention for students with disabilities in a STEM major. Bellman et al. (2015) inves-

tigated the outcomes of academic success coaching for students with disabilities by coaches who have some knowledge of disabilities. In the evaluation of 60 students in over 300 one-on-one sessions, students reported learning new skills for academic success including note-taking, self-advocacy, and stress management. Other research has supported the use of electronic mentoring (e-mentoring) to achieve similar results of support. In a study with eight community college students, Gregg et al. (2016) found STEM students with a disability matched with an e-mentor received coaching on self-advocacy strategies, resulting in increased self-determination. In sum, the available research about students with disabilities in STEM has largely focused on barriers and challenges in coursework and how faculty may address these challenges; the research has focused comparatively less on student experiences in STEM classrooms and on campus.

LGBTQ Students in STEM

To date, very little attention has been paid to how LGBTQ students experience STEM learning environments. However, the limited available evidence provides ample cause for concern. For example, studies have demonstrated that engineering schools reproduced heteronormativity and hegemonic masculinity (Cech & Waidzunas, 2011; de Pillis & de Pillis, 2008) and that biology classrooms are often unwelcoming to LGBTQ students (Cooper & Brownell, 2016).

In one of the most comprehensive studies to date, Linley et al. (2018) employed an ecological systems framework (Bronfenbrenner, 2005) to explore the experiences of 15 LGBTQ STEM majors within different institutional contexts (varying in size, public vs. private, religious vs. secular). While participants found community with out-of-class LGBTQ peers, their experiences in STEM-specific spaces were mixed, with “positive experiences ... primarily focused on specific interactions with STEM faculty [and] negative experiences ... primarily about specific interactions with co-workers, student peers, or perceptions of the STEM workforce” (Linley et al., 2018, p. 8). For instance, transgender students in the study reported that faculty used their correct names. Still, Linley et al. (2018) reported “students rarely described STEM faculty as LGBTQ allies” (p. 9) but as supportive individuals in general. The researchers called for additional research on LGBTQ students’ intersectional experiences in STEM majors.

On the faculty side, STEM faculty with minoritized sexual and/or gender identities reported feeling that they had to “pass” as cisgender and/or heterosexual in order to be successful in their fields (Barres et

al., 2017; Bilimoria & Stewart, 2009) and some faculty faced overt hostility (Bilimoria & Stewart, 2009). Such negative experiences might negatively impact faculty retention (Patridge et al., 2014). It is no surprise then that LGBTQ individuals in STEM fields report being less likely to disclose their sexual and/or gender identities to their students and colleagues than to family or friends and also reported feeling that their workplace was unsafe (Yoder & Mattheis, 2016). These findings were more pronounced for students than faculty, which likely contributes to inequitable STEM opportunity structures for LGBTQ students. Researchers who have studied LGBTQ people in STEM environments broadly (including faculty and the workforce beyond higher education) have outlined challenges in the climate for gender and sexuality, including hesitance of LGBTQ people to disclose their identities to others and a lack of role models and allies for LGBTQ students in the STEM fields. Published research does not address the intersections of these multiple marginalized identities as experienced by LGBTQ students with disabilities in STEM fields.

Methods

This manuscript reports on findings from a subset of data drawn from a larger qualitative study about the identities and higher education experiences of 25 LGBTQ students with disabilities at a large, predominantly white research university in the South. Of these study participants, five majored in STEM fields, and during analysis for the larger study, significant differences in experiences of the academic and broader campus climate emerged between STEM and non-STEM majors, thus prompting the researchers to spotlight the experiences of the five students majoring in STEM.

The principles of constructivist grounded theory guided data collection and analysis for the original study (Charmaz, 2014). These principles included generating meaning inductively from data collected rather than being guided primarily by extant literature and using a constant comparative approach to analysis (Glaser & Strauss, 1967) that calls for generating possible patterns and themes early on in analysis and continuing to compare and refine these patterns as additional data is analyzed. Unlike more positivist research approaches, in constructivist grounded theory, “participants’ implicit meanings, experiential views ... are constructions of reality” that are subjective and guided by researchers’ subjective interpretations of how participants describe making meaning of their experiences (Charmaz, 2014, p. 17).

The study received IRB approval and all participants received information about the study's goals and procedures prior to being asked to sign a consent form. All participants were provided with information about relevant campus resources, including counseling services, should they wish to use them. Criteria for participation in the original study included self-identification with a disability and as LGBTQ and enrollment either as a graduate or undergraduate student. Participants were purposefully recruited primarily through electronic means (Jones et al., 2014), with email messages distributed through the campus LGBTQ center, disability services office, LGBTQ and disability student organizations, and academic units including disability studies and gender studies. We focus on the experiences of the five STEM majors in the sample (see Table 1): two engineering students and one student each in biology, computer science, and geology. Participants' disabilities included anxiety (three students), Asperger's or autism spectrum disorder (three), depression (three), ADHD (one), eating disorder (one), health problems/injuries (one), mental health problems (one), and PTSD (one). Because the five participants in this study used a variety of terms to describe their gender and sexuality, and because no participant identified as lesbian, we use the term "queer students with disabilities" to refer to participants in this study, taking up queer as an umbrella term to describe these diverse gender and sexual identities. To protect participant confidentiality, pseudonyms are used in place of participants' names.

Intensive, semi-structured interviews (Charmaz, 2014; Jones et al., 2014) functioned as the primary method of data collection. Interviews lasted 90 minutes on average and were audio-recorded, transcribed verbatim, verified with participants (member checking; Jones et al., 2014) and uploaded to Dedoose to facilitate data analysis. The interview protocol was designed to address how students conceptualized their multiple, intersecting social identities, with a focus on disability and LGBTQ identities, as well as students' campus experiences relative to their identities. Students were encouraged to speak to, and provide examples of, their individual experiences on campus and perceptions of navigating higher education relative to their unique identities. The interview protocol included a sequence of several sections with open-ended questions designed to elicit participants' experiences with:

- Life as a college student including college and major choice, experiences in the major, and campus involvement (e.g., "What are you now studying and how did you choose it?"

"Tell me about some campus resources you have used.").

- Social and cultural identities, relationship of multiple identities, and experiences of marginalization (e.g. "What are some of your social and cultural identities?" "Do you identify with disability and/or LGBTQ communities, and if so, how?" "Could you describe any prejudice or discrimination you have experienced?").
- Identification of allies and advice for campus leadership (e.g. "Who would you describe as allies in your life?" "What advice would you give to administrators and faculty members to improve the campus climate for people who share your identities?").

Because interview questions were open-ended and the study was designed to understand students' experiences in the context of the institution and their full experiences, students often brought up examples relevant to other identities including race, ethnicity, and gender, which is reflected in the findings; however, the researcher also probed to explore disability and LGBTQ identities in particular if a respondent did not address those identities in their responses. To answer the research question for this paper, we focus on students' experiences in STEM majors, further contextualized within their broader higher education experiences.

In constructivist grounded theory studies, researchers attempt to reach theoretical saturation (Charmaz, 2014), when significant new insights and/or themes relevant to the research question no longer emerge from additional data collection. By examining a subset of participant interview transcripts (i.e., the five students majoring in STEM fields) from the larger study that had already concluded, we did not reach saturation. The considerable diversity among our participants in terms of majors, experiences on campus, and gender, sexual, and other identities yielded unique insights and presents ample opportunities for future studies that can reach the point of saturation. We engage in data analysis and coding procedures guided by a constructivist grounded theory approach, as we describe below, and present in findings a thematic analysis of interview transcripts rather than developing an original theory specific to the experiences of LGBTQ students with disabilities in STEM.

Data analysis began with reading each participant transcript individually and writing analytic and reflective memos about the transcripts. Then, initial coding practices included line-by-line coding and in

vivo coding using participants' own words as codes (Charmaz, 2014). Subsequent coding included focused coding, which entailed identifying the most common and significant initial codes, grouping like codes, and beginning to identify the themes that are presented in this paper to answer the research question. During all phases of the analysis, the two researchers wrote memos about our impressions of the data and met frequently to compare insights and arrive at consensus, a strategy designed to enhance the credibility of our analysis. The researchers also reflected upon our subjectivities and relationships to the research topic to clarify our positionalities and potential biases. The first author conducted the original study based on his experiences directing an LGBTQ resource center on a college campus and a desire to better understand, support, and work with LGBTQ students with disabilities. He identifies as a white, cisgender, queer, middle-class man without a disability who is a first-generation college graduate and a faculty member in a higher education program. The second author joined the project after data was collected based on her interest in student development and her professional practice as a student affairs administrator. She identifies as a white, cisgender, middle-class female without a disability.

The researchers sought to employ Jones et al.'s (2014) guidelines for promoting trustworthiness of a qualitative study. Credibility was bolstered through member checking, the use of multiple researchers, feedback provided by two peer debriefers on this study, and providing thick description of participant examples in the findings. Because neither author presently has a disability, we were especially attuned to understanding the nuance of participants' experiences related to disability, and we engaged peer debriefers (two faculty members, including one who is a former disability resource center director and identifies as a person with disabilities) to review the study and offer feedback about our descriptions and conclusions. We sought to ensure dependability by documenting all steps of the research process, including data and collection and analysis, and sharing this documentation with our peer debriefers. Confirmability "requires the researcher to tie findings data and analysis" (Jones et al., 2014, p. 37), which we attempted to bolster by providing numerous participant examples and direct quotations within the findings as evidence of the themes we identified. Though this study was conducted in one institutional context, we hope the descriptions and implications we offer in this paper can provide some degree of transferability to readers' own contexts.

Findings

The research question guiding this study is: How do queer students with disabilities majoring in STEM fields describe their collegiate experiences, both within and outside of STEM spaces? The findings section outlines students' experiences of stigma and marginalization in STEM spaces, male-centered and heteronormative STEM cultures, a physically and socially inaccessible campus, and a lack of intersectional resources that prompted some students to become advocates. While we begin this section with students' experiences directly related to their STEM majors, we also take a holistic view by exploring students' perceptions of their collegiate experience beyond STEM-specific spaces that undoubtedly inform their overall higher education trajectories.

Isolation and Marginalization in STEM Spaces

Faculty helped shape how students viewed themselves in the classroom and within their broader academic experience. Students struggled to build and maintain relationships with faculty because they said their identities would be ignored or ostracized by faculty. Jordan reported he frequently needed assistance outside of the classroom to succeed within his courses. Initially, Jordan would reach out to his STEM faculty for office hours and supplemental learning, but struggled to find supportive faculty who would work with his learning needs:

It's a bit harder for me to go to office hours and talk with professors because the more competitive a place is, the more stigmatized obviously it is to be slower or stupid, to not be able to do things as quickly as the others. Sometimes, the professors, because they are so busy, they aren't willing to sit down. Not always, but a lot of them are not willing to sit down and help me through it. They say that's really simple, you should have gotten it, instead of helping me. It's always like I don't like saying anything when I don't understand anything because everybody else gets it and I don't.

After continual failed outreach to faculty, Jordan disengaged within the classroom and stopped engaging in out-of-classroom learning opportunities. He struggled to stay empowered to persist toward graduation in his major of choice.

Students sometimes felt marginalized by faculty and classmates. Veronica often felt isolated as a bisexual woman of color with disabilities majoring in geology:

It's important in the field of geosciences to have more than just the freaking white male heterosexual voice represented, which is, when you're looking at it, all of our geologic history, the freaking documentary that we were watching, was called "Men of Rock." I'm a woman. Where does that leave me? It feels like there's no space for me in that world, and sometimes we have to create that space.

Embedded in Veronica's reflections on her place in her major was an awareness that overrepresentation of heterosexual white men took place not just on campus and in her interpersonal interactions, but within her field as a whole. She identified that she did not see herself within the curriculum or welcomed in the classroom environment.

While Jordan and Veronica's experiences were negative, the other three participants in the study did not specifically refer to their faculty members as supportive or unsupportive, but did describe other challenges in the classroom and on campus detailed throughout the findings. Outside of the classroom, participants described navigating a STEM climate in their departments and colleges that often lacked diversity. Students often perceived they were the "only one" (the only queer or trans* person, person with a disability, person of color, and/or woman) in spaces such as organizations and STEM resource offices. Regina reflected on the isolation of often being the "only one" in her department, as she was not aware of others who used disability accommodations. Part of the solution to this problem, as she saw it, was to focus on recruitment and retention of marginalized groups, including people with disabilities and queer people.

I think one big problem is that there's a really small minority of people in those types of populations in any given discipline. ... And I feel like if there were programs that specifically targeted people who aren't represented in higher education, so that there are more people in those departments, and then that would lead to the departments becoming more accommodating because those people would need the accommodations. So disabled people, queer people, people of color, anything like that, I think that would be helpful.

In Regina's view, recruitment would serve not only to bring in a more diverse student population, but could also improve the climate for students currently in the department or college by normalizing their presence and other aspects of academic life connect-

ed to their identities, such as receiving disability accommodations.

Male/Masculine-Oriented, Heteronormative STEM Cultures

Across the board, participants described male-centered STEM cultures that promoted heteronormativity and hegemonic ideas of masculinity. While on the whole Hunter described his major's student organization as "probably one of the most inclusive and accepting places that I've ever been to," he lamented the "bro culture" of a scholarship program in computer science that he considered before attending the university, but ultimately decided not to pursue. He said that students in the program, "were a little more invested in, I guess, 'bro culture.' I guess that's never really been my thing. Coming out made me shy even farther away from that. ... We wouldn't have really had much in common." Hunter perceived the largely male group of students in the program to be conservative and hypermasculine, deciding that he would not fit in with such a group. Though alienated from such spaces due to gender and sexuality norms, Hunter perceived that being on the autism spectrum, and being introverted and independent, complemented his choice of major in computer science.

Women in the study, in particular, pointed out a lack of women in their disciplines among both students and faculty members. Veronica described feeling that she did not belong as a geology major, particularly as a feminine-presenting woman:

I can just see it in their eyes—they don't think I belong there. I hope every day that I will fight to not internalize that. ... If I continue to walk around and get stares from old white men that tell me that I don't belong, one day I may internally, or even vocally, express that and truly think, maybe while I'm taking a test, maybe while I'm considering applying to graduate school, or maybe even before that, when I'm consider applying to university, that I don't belong there.

Veronica doubted that she belonged on campus and in her geology major in particular. She contrasted the experience of unwelcoming stares with the validation she experienced interacting with one of the few female professors in her field: "I don't even think she knows that I idolize her." One solution, Veronica argued, was increased diversity education for faculty and staff, though she acknowledged that many might dismiss the importance of another training. "That attitude needs to change. It can't just be another sensitivity training, it can't be a waste of a faculty person's

day ... but it's important enough that it will affect a student's academic performance and how welcomed they feel in that classroom." Veronica thought additional diversity training was warranted because how faculty treat students can affect their sense of belonging and self-efficacy.

Students became involved in advocacy efforts to increase women's presence in STEM fields, among other types of diversity, in response to their experiences of marginalization. Regina described a negative experience during an engineering internship as an undergraduate. An older male professional at the internship site, having just met her, told her it was not too late to switch to a less difficult major:

I had completely changed careers, I was at the top of my class at the time, [and] it was not very good of an experience for me even though I know I didn't need this guy's approval. ... People like him are in charge of a lot of different industries and different companies. It's frustrating for me to know that that's what women have to go up against.

While this incident occurred prior to Regina's time at as a graduate student, it undoubtedly influenced her perceptions of the negative climate women often face in STEM fields. In response, Regina described participating on panels related to women and/or disability in STEM: "I do have a strong affiliation for increasing the female population in science and engineering, because I am female and I have to deal with all of the problems that women in engineering have to deal with." She also volunteered with the local children's museum that promoted science and viewed this as one avenue to interest underrepresented groups in science from an early age.

Despite involvement in advocacy efforts for underrepresented groups in STEM, Regina vacillated between saying her identities as queer and a woman "[don't] really come up at all," and acknowledging that she passed for other identities and did not often disclose her gender and sexual identities:

I'll disclose it if someone explicitly asks me, but otherwise, not really. Because one of the problems with being in engineering is, for the most part, it's a lot more conservative than social sciences and liberal arts where I'm used to. It's one of those things that I know it is fine, but I don't want to have to deal with people being jerks about it. I don't look anything other than straight, so I can pass. That's not really something that comes up very often.

Despite her assertion that gender and sexuality rarely come up, Regina also pointed that the engineering climate is conservative and that she often chooses not to disclose her identities.

Physical and Social Inaccessibility On Campus

Beyond the classroom and other STEM spaces on campus, students noted a lack of accessibility, broadly conceived. Participants including Regina and Courtney had disabilities and health problems that often functioned to limit their mobility on campus and, in turn, affected how they engaged (or did not engage) with university resources. Regina described difficulty navigating older buildings in various states of disrepair:

It's really hard to find ... the entrances to get in [some buildings] if I'm having trouble with my muscle strength. ... Where do I find the door with the power assist button? They're not always labeled, so it's hard to get around. This construction [throughout campus] doesn't make it any easier.

Regina grew frustrated that accessibility on campus varied widely from one building to the next and that she did not always have a sure path to enter and navigate campus with ease. She described the graduate student lounge being tucked away in a basement that was difficult to reach. Because of her fluctuating mobility needs, she was not able to access resources such as the student lounge, where she might have solidified or made new social connections.

In addition to physical inaccessibility, participants also described a social climate that was often inaccessible as well. Students talked about the university as large and overwhelming. Regina said that it's "alienating how big [the university] is." She went on to describe added difficulty meeting others as a graduate student:

I feel like the university is designed for undergrads, but grad students make up a huge portion of the population, but there's not a lot of resources for them. I feel like for the most part we're left to be on our own and fend for ourselves. Everybody makes friends within the department, but because of my unusual journey to the program, I'm older than everybody else, and so it's hard for me to relate to them on the level that I need to. That's one thing that I've struggled with.

In the daily hustle and bustle of the large campus, another student, Courtney, discussed seeking out spaces where she could be alone and recharge, even if

only for a few minutes, such as a gender-inclusive restroom where she could collect herself. Students, such as Courtney, reported that even though the university was large and well resourced, they felt there were few places they could be alone for a few minutes. Courtney also sought to engage university-wide resources such as the counseling center, where she began seeing a therapist. However, she said that her need for long-term treatment resulted in her being referred to community-based resources due to a cap on the number of appointments a student can make at the counseling center, a policy that frustrated her.

Participants expressed discomfort with the dominant culture of the university, which they viewed as fueled by athletics, alcohol, and predominantly white fraternities and sororities. Hunter recalled being harassed while walking hand-in-hand with his boyfriend in a student neighborhood adjacent to campus and said that fraternity members' homophobia tended to emerge while they were drinking and partying, leading him to avoid the area when possible. Staff sometimes perpetuated an exclusionary climate. Jordan recalled an incident in the campus LGBTQ center when he spoke to a staff member so he could try "to find ways to connect my [engineering] major to helping underserved people. [The staff member] said, 'You're obviously in the wrong major.'" While Jordan desired to find a way to connect his engineering major to his passion for social justice, he felt dismissed by the staff member he sought out.

Lack of Intersectional STEM Resources and Becoming Advocates

Though participants engaged with some targeted resources such as programming for women and people of color in STEM, they noted that these resources were focused on singular aspects of social identities and often lacked an intersectional focus. This lack of intersectionality played itself out in students' interaction with student affairs staff and peers. One participant, Veronica, described diversity as an "afterthought" in the sciences: "There's not a space there to kind of express these identities. If there could be like a multi-identity group for science majors in general—maybe I just haven't just found it because the university is kind of big and sometimes it's hard to find things." She reflected on feeling as though she was forced to choose between different identities when she sought to engage the college's resources and organizations.

Jordan, who identified as trans, used male pronouns, and occasionally described himself as a girl, became involved with the women in engineering program during his first year. His involvement included

volunteering to conduct outreach events for girls in elementary and middle school, but as the only Hispanic-identified and Spanish-speaking participant in the program, he felt overburdened by requests to lead events in Spanish: "I can't be the only Hispanic girl in engineering as a whole ... I can't be the only Spanish speaker there." Staff also sometimes asked Jordan to be the intermediary between women in engineering and a Hispanic engineers group, which made him feel uncomfortable and further tokenized. Jordan's experience with the Hispanic engineering group was not much better, as he felt excluded by racially insensitive jokes.

Jordan labeled the women in engineering program as "not intersectional at all. It only pretty much serves the white and Asian girls. I feel very much left out by them. ... I don't feel comfortable with them at all, but I still have to use it." Jordan shared a time when one of the program staff members questioned his disability diagnosis when he was seeking support upon identifying with Asperger's: "She sat down with me and said, 'You don't look like you have Asperger's.' The whole time she was just saying, 'Maybe you don't have it anymore. Are you sure? Have you been diagnosed yet?'" Such questioning and objectification left Jordan feeling worse than when he initially sought out the staff member. Negative experiences with multiple STEM spaces, including classes, diversity resources, and student organizations, left Jordan feeling distressed and lonely:

I'm almost always very uncomfortable here because it's a white majority. ... In engineering, it's very, very unwelcoming where every day I feel, "you don't deserve to be here, you shouldn't be here." ... I'm one of the very few Hispanic girls in engineering. Then when you add autism, I am very much alone. Every day, I see it, just looking around my peers and looking at my professors and the way that my professors treat me compared to the rest of my classmates. It's always just a very lonely experience.

Jordan described the intense toll that marginalization within the engineering context exacted upon him. Jordan's negative experiences in his major (in and out of class) reached the point that he eventually left engineering for a liberal arts major. He described feeling validated by his courses in liberal arts rather than experiencing panic attacks as he did in engineering courses: "I feel like if I did go into liberal arts ... I would feel like I dodged a bullet. I would be fine with it."

In response to negative experiences on campus (both in and out of STEM-specific spaces) and a lack of adequate resources, students discussed their efforts to become involved in non-STEM spaces, involvement which often included leadership and advocacy for diversity and equity issues. In this way, involvement functioned as a way for students to have a better experience on campus by connecting with like-minded others to build community. For those who became advocates, their work also functioned to pave the way for others and hopefully improve the university climate in both STEM and non-STEM spaces.

Participants became involved in a range of activities outside of their academic majors, including the LGBTQ center (Hunter), a queer people of color organization (Jordan), a bisexual student organization (Courtney), and becoming a resident assistant and orientation advisor (Veronica). Courtney founded a bisexual student organization after realizing that few resources targeted toward bisexual students existed on campus.

I've always been the kind of person that really enjoys helping people and advocating for people. I think that that's a passion of mine, to learn ways to help people. ... I feel like [we need] more resources specifically geared toward bisexual and pansexual students. Also, just more visibility, because that's another thing that's a big deal to people in the bisexual community, even amongst each other, is visibility, the lack of visibility. People tend to think that they're just aren't that many people who are bisexual out there because we don't stand up and wave our flag.

The experience of founding the organization allowed her to connect with others and channel her energy on campus toward improving the climate for herself and others. It also connected with her disability identity, as Courtney placed an emphasis on the group discussing mental health issues as part of its agenda.

Discussion

Queer students with disabilities in STEM majors described a chilly climate around disability, gender identity, and sexual orientation — the initial focal points of this study — but also relative to race, ethnicity, and gender, a testament to the multiple identities students held and their holistic experiences on campus. This chilly climate was enacted within STEM spaces (classrooms and organizations) as well as in broader campus spaces, largely confirming evidence from prior research on students with disabilities (e.g.,

Lee, 2011; Moriarty, 2007) and LGBTQ students in STEM (e.g., Linley et al., 2018). While the students in the study did not attribute all of the obstacles they faced to disability or LGBTQ identities or other forms of marginalization, this study offers one contribution toward understanding students' holistic experiences on campus that undoubtedly influences their academic experiences and success.

Several students described their STEM faculty members as dismissive and unwilling to work to support students individually; other participants were neutral on this point and did not describe faculty as either supportive or unsupportive. Faculty are extensively trained in their content areas, but preparation to teach within a college classroom rarely includes training on how to work with marginalized students and students who use disability accommodations. Participants stated that when they were dismissed by faculty members when trying to reach out for accommodation or build rapport, it lowered the likelihood they would reach out to other faculty members in the future, thus affirming the importance of further training for faculty. Scholars have posited that faculty may hold negative stereotypes of students with disabilities relative to their ability to study in STEM fields and that training and implementation of universal design may be able to help change those perceptions (Thurston et al., 2017) and help faculty members become more inclusive (Moriarty, 2007). In particular, increased faculty training about providing classroom accommodations for students with disabilities (Love, 2014) could improve the climate in STEM, as student accommodations were not always taken seriously or were seen as rigid guidelines beyond which faculty would not provide support.

Beyond experiences with faculty members, students reported feeling isolated and tokenized within STEM spaces as a frustrating and exhausting experience. Students characterized STEM spaces as hypermasculine, male-centered, and heteronormative, a finding in line with prior research (Cech & Waidzunas, 2011; de Pillis & de Pillis, 2008; Hughes, 2017). Further, while one student cited the presence of a female faculty member as a role model, participants did not name any out queer or trans* faculty members in STEM fields. If faculty do not identify as queer or trans* or do identify with the population but do not disclose their identities or pass as cisgender and/or heterosexual, there is a missed opportunity to provide role models and mentoring based on shared identity that could improve the STEM climate (Barres et al., 2017; Bilimoria & Stewart, 2009).

Lastly, this study's findings affirm the need for far greater attention to multiple marginalized iden-

tities that students experience within STEM. While all students in this study experienced marginalization based on at least two identities (i.e., disability, gender identity, and/or sexual orientation), students also reported instances of harassment and invisibility based on race and ethnicity. This can create a compounded experience of marginalization that isolates students. Students pointed out that curricula and course content, including textbooks and documentaries, often rendered the contributions of people with disabilities, LGBTQ people, and women in STEM as invisible. Further, programs such as a women in engineering group that may have been created to increase inclusion may actually serve to further marginalize students if their focus is not intersectional and does not account for differential experiences based on sexual orientation and race. One result of these marginalizing experiences is that students (and faculty) may feel unwilling to disclose their disabilities and/or queer identities, thus preventing opportunities for visibility, inclusion, role modeling, and mentorship.

Limitations and Future Research

As with all qualitative research, this study is not designed to generalize findings to a larger population, though we hope our description and analysis of participants' experiences offers transferable insights that readers can apply in their own contexts. This study reports on the experiences of five queer students with disabilities at a predominantly white research university in the Southern United States. Thus, an exploration of these topics in different institutional contexts (community colleges, regional comprehensive universities, liberal arts colleges, minority serving institutions) and regional settings is warranted. In addition, the participants represent a handful of disciplines within STEM (biology, computer science, engineering, and geology), leaving gaps for future research and better understanding of discipline-specific experiences. Future work could explore experiences that vary by specific disabilities, as this study primarily included students with autism spectrum disorders, psychological disabilities, and health problems, as well as specific LGBTQ identities not captured in this study. Despite these limitations, this study offers one of the first empirical examinations students living at the intersections of queer identities and disabilities in STEM fields and hopefully offers one contribution to continued attention to equity and diversity within STEM and areas for further inquiry and action.

Implications for Practice

In analysis of the findings, the data suggest that there is work needed to improve the recruitment and retention of queer students and students with disabilities in STEM fields. Previous research and the findings report students feeling tokenized and isolated and experiencing a chilly campus climate. Thus, the primary implications for practice can be broken down into three areas: inclusive classrooms and curricula, recruitment and retention, and accessibility.

Previous research focused heavily on the classroom experience created by STEM faculty. Students in this study reported problematic classroom structure and curriculum. Faculty members should consider creating classroom structure based on universal design, which meets the needs of students by striving to create equity and use varied teaching and learning methods within the classroom. Beyond classroom structure, STEM faculty should create and assess their curriculum to ensure expert contributions come from a wide array of identities. By making the curriculum more inclusive, students will be able to engage in the content when seeing themselves reflected within it. Before implementing any classroom or curriculum changes, faculty and staff should participate in inclusion and equity training related to student identities including students with disabilities and LGBTQ students. Previous research and students within the study report distant and undeveloped faculty relationships, further isolating marginalized students within the classroom. Faculty need to become aware of the different type of student identities showing up within their classroom, how to support the success of all students, including different forms of accommodation and how to build relationships with students from diverse backgrounds.

Students reported feeling tokenized and isolated on campus with few resources provided to create community and a sense of belonging. Previous research found that when students with disabilities in STEM are provided a one-on-one connection to a mentor or faculty member to process their experiences with the goal of success, students perform better in and out of the classroom. Having a mentor or a coach to talk about academic success, accommodation, and transition would have a positive effect in the sense of belonging. This coaching in previous studies has been done online and in person, but regardless of modality, it is important that the mentor is trained to work with students with disabilities and can offer success strategies. These mentors can decrease the tokenization a student may feel but also assist in the recruitment and retention of a diverse student body. By strategically

putting resources toward training of faculty, a universally designed curriculum, and a welcoming campus climate, current students will thrive while potentially attracting more students who share their identities.

Conclusion

In line with national imperatives to increase access to and success in STEM fields, researchers have begun exploring the experiences of students with varying disabilities in STEM learning environments. Less work has examined the experiences of lesbian, gay, bisexual, transgender, and queer students in STEM fields. Students who experience marginalization on campus based on both disability and LGBTQ identities may experience isolation, tokenization, and an overall chilly climate in the classroom and on campus, insights largely borne out in this qualitative study of five queer students with disabilities at a predominantly white research university, some of whom also navigated multiple, compounding forms of marginalization based on gender, race, and/or ethnicity. The findings of this study suggest that researchers and practitioners should devote greater attention to intersectionality within STEM student populations and can improve the climate by focusing on creating inclusive classrooms and curricula, improving recruitment and retention, and creating greater accessibility through the use of universal design.

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Table 1*Participants*

Pseudonym	Major	Classification	Pronouns	Self-identified disabilities ^a	Self-identified LGBTQ identities	Self-identified race/ethnicity
Courtney	Biology	Undergraduate	she/her	Anxiety, depression, health problems, injuries	Bisexual	White
Hunter	Computer science	Undergraduate	he/him	Asperger's	Gay	White
Jordan	Engineering (transferred out)	Undergraduate	he/him	ADHD, anxiety, Asperger's, depression	Demisexual, queer, trans	Person of color, Mexican, Chinese
Regina	Engineering	Graduate	she/her	ASD, health problems, injuries, mental health	Queer	White
Veronica	Geology	Undergraduate	she/her	Anxiety, depression, eating disorder, PTSD	Bisexual	Mexican American

Note. ^aADHD = attention-deficit/hyperactivity disorder; ASD = autism spectrum disorder; PTSD = post-traumatic stress disorder

Toward an Inclusive Pedagogy Through Universal Design for Learning in Higher Education: A Review of the Literature

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Abstract

The presence of Universal Design for Learning (UDL) has gained traction in K-12 and postsecondary settings over the past two decades as educators have sought to reframe traditional means of teaching and learning. In the realm of higher education, UDL-related research is somewhat limited, hampered by competing definitions, aims, and constructs. The purpose of this paper is to review literature on UDL in postsecondary settings to understand how faculty and researchers conceptualize and operationalize UDL. This review extends the work of previous research by focusing solely on UDL, as developed by researchers at the Center for Applied Special Technology (CAST) and including research that is both empirical and descriptive. Our findings suggest that ambiguity still exists as to UDL's application as an intervention, or framework; this has implications for its use in advancing inclusive pedagogy and in disrupting a discourse of normalcy that is pervasive in postsecondary settings. Implications for future research are offered.

Keywords: universal design for learning, postsecondary education, higher education, disability studies

The image of a large lecture hall filled with hundreds of students as the archetypical college classroom may still be prevalent on some campuses, but by and large this conception is misrepresentative of many institutions of higher education (IHEs). As is the case in K-12 settings, a range of class sizes, instructional methods, and learning environments are represented across and within postsecondary settings; smaller instructor-student ratios, advances in technology, and other emerging innovations continue to transform the landscape for both faculty and students.

The presence of Universal Design for Learning (UDL) in IHEs has gained traction over the past nearly two decades as educators have sought to reframe traditional means of teaching and learning. Developed by the Center for Applied Special Technology (CAST) and derived from Universal Design (UD) in architecture, UDL focuses on purposeful design that considers the diverse needs of a wide variety of individuals (Dolmage, 2017; McGuire et al., 2006; Meyer et al., 2014; Rose & Meyer, 2002). UDL is focused specifically on the proactive design of learning environments (including K-12 and higher education classrooms) and is distinguished from other

similar offshoots of UD (e.g., Universal Instructional Design, Universal Design for Instruction) by its grounding in the neuroscientific aspects of learning (Schreiner et al., 2013).

CAST founders maintain that UDL is an integrative framework that combines understandings from neuroscience, architecture, and technology to design instruction and learning environments (Meyer et al., 2014; Rose & Meyer, 2002). Furthermore, CAST defines UDL as a “framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn” (CAST, 2018). The framework is built on the premises that (a) there is systematic variability among learners, (b) learning is equal parts cognitive and emotive, and (c) the networks of the brains engage, process, and represent information in different ways for different people (Meyer et al., 2014; Rose & Meyer, 2002). In conjunction with brain research, UDL continues to evolve as educational research related to different methods of instruction and curriculum design advances.

Federal education laws, including the Individuals with Disabilities Education Act (IDEA), and the Every Student Succeeds Act (ESSA), have signaled support

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for UDL in elementary and secondary schools. The 1997 reauthorization of IDEA pushed the boundaries of educational access, requiring that students with labeled disabilities be educated in the least restrictive environment to the greatest extent possible, and provided with assistive technology. This law represented a (theoretical if not practical) union between special and general education (Hehir, 2009). According to CAST researchers, IDEA effectively opened the door for a UDL approach in K-12 classrooms; however, UDL has undergone much theoretical revision since that time (Meyer et al., 2014).

An unintended consequence of linking UDL with policies related to students with labeled disabilities is the conflation of UDL and special education. UDL is often misinterpreted as a special education initiative, or a framework only for students with labeled disabilities. The 2015 passage of ESSA may have somewhat assuaged this confusion—for the first time, UDL as a practice was endorsed by federal general education legislation (Gravel, 2017). While UDL's founding organization, CAST, has historical connections with special education, UDL focuses on learner variability rather than disability. Furthermore, the UDL framework can be applied to settings outside the confines of K-12 education, as evidenced by its definition in the 2008 reauthorization of the Higher Education Opportunity Act.

This extension of UDL into higher education will be explored in this paper. Despite the prevalence of UDL in statewide educational initiatives, federal legislation, and even preservice teacher education coursework (Scott et al., 2017), research on the experiences of UDL implementation by educators at multiple levels is limited (Gravel, 2017). In the realm of higher education, UDL-related research is not only limited, but ambiguous—hampered by competing definitions and interpretations. While guidelines for implementation exist (CAST, 2018), many UDL scholars are reluctant to identify strict definitions or criteria. UDL is intended neither as a program, nor as something to implement with fidelity. Thus, there are multiple interpretations of UDL; in a sense, its dynamic and flexible nature can also be interpreted as its greatest source of elusiveness.

Despite this ambiguity, UDL has had successful forays into higher education, both in research and in practice. A 2011 literature review synthesized empirical work in postsecondary education related to UDL; however, included publications drew on other UD models as well (Roberts et al., 2011). Universal Design for Instruction (UDI) was once considered the version of UD most applicable to higher education, as it was specifically developed for use in postsecond-

ary settings (McGuire et al., 2006). A primary reason the review by Roberts and colleagues is centered on UDI rather than on UDL may very well be that the use of UDL outside of K-12 settings was especially limited at that time. Recently however, it appears that UDL has been more widely accepted as a relevant framework for designing postsecondary learning experiences and/or environments (UDL on Campus, n.d.). As such, UDL has also become a more familiar term across educational age spans with a multitude of theoretical and practical interpretations.

Nevertheless, Roberts and colleagues' 2011 review detailed several noteworthy findings. First, the authors found very little research that explored the effectiveness of UD models on student outcomes (GPA, retention rates, etc.). In addition, these authors emphasized that empirical work exploring UD in higher education would benefit from more quantitative and mixed methods approaches. The authors expressed concern that three-fourths of the pieces in their review employed qualitative methods, which substantially limited the generalizability of their findings.

Since the publication of Roberts et al.'s review there have been four subsequent reviews of UDL-related literature. While some of these have incorporated UDL applications in higher education, none have concentrated solely on postsecondary settings. Rather, these have varied in focus, examining UDL in PK-12 environments (Ok et al., 2017), Universal Design or UDL as an educational intervention (Capp, 2017; Rao et al., 2014), and UDL as an educational framework (Al-Azawei et al., 2016). Each of these reviews makes a distinct contribution to the literature. Analyses by both Capp (2017), and Rao and colleagues (2014) highlight the outcomes of UDL as an intervention; both note the generally positive effects of UDL implementation at various educational levels. Capp's meta-analysis is theoretically situated within an inclusive education framework and examines the outcomes of UDL implementation in empirical studies between 2013 and 2016 ($N=18$). Rao et al. captured a somewhat broader sense of the terrain of Universal Design, examining the efficacy of multiple models of UD (e.g., Universal Design for Instruction, Universal Instructional Design, UDL) across primary, secondary, and higher educational settings. The authors included only empirical research in their review ($N=14$), with the goal of understanding how researchers are employing different models of UD as an intervention.

Al-Azawei and colleagues' (2016) review aimed to pick up where Rao et al. (2014) left off; however, they analyzed only those empirical studies that utilized the UDL framework (CAST, 2018; Rose &

Meyer, 2002). The authors of this review concluded that while the literature suggested that UDL holds promise as a pedagogical framework across grade spans and formats (online, hybrid, etc.), the ways in which researchers interpret and comply with UDL principles remain ambiguous. No clear answers about the validity of UDL as a framework were realized.

This review is distinctly different from prior reviews for several reasons. While our aim is to gain a sense of the scope of Universal Design research in higher education like Roberts and colleagues (2011), we have elected to look beyond empirical work that emphasizes outcomes and seeks validity. We are interested in the application of UDL that advances and sustains inclusive pedagogy as an end in itself. By analyzing empirical and descriptive pieces, we hope to gain a clearer understanding of the various ways researchers in higher education are operationalizing and conceptualizing UDL. Due to its continued iteration and development in the years since its inception, we have elected to focus solely on the UDL framework (CAST, 2018; Meyer et al., 2014; Rose & Meyer, 2002) to the exclusion of other UD models. Additionally, because UDL specifically has been addressed in higher educational policy and practice, it has demonstrated its sustainability in an educational climate that is constantly in flux. The questions guiding this review are as follows:

1. In what ways is the UDL framework operationalized in postsecondary contexts?
2. In what ways is UDL conceptualized as a framework for inclusive pedagogy in higher education, attending to notions of disability, ability, and variability in theory and practice?

Conceptual Framework

The conceptual framework for this review attends to the ways UDL functions to support inclusive pedagogy in higher education. Yet the concept of inclusivity always brings with it a myriad of complexities of placement, belonging, and the rights of individuals with disabilities. As alluded to in the introduction, UDL has deep connections with special education, and is sometimes viewed as a special education initiative. Yet theoretically, UDL appears to be more closely aligned with Disability Studies in Education (DSE). DSE is concerned with problems and issues in education related to exclusion and/or oppression of individuals with disabilities. DSE conceptualizes disability as a social, political, and cultural construct that plays out in complex ways in educational settings (Cosier & Ashby, 2016). UDL scholars have

consciously shifted their interpretations of disability away from individual deficits to disabling environments (Gravel, Edwards, Buttimer, & Rose, 2015; Meyer et al., 2014), which is somewhat consistent with a DSE framework. DSE supports the notion that individuals with certain types of bodily (cognitive, behavioral, linguistic, etc.) impairments are disabled by inhospitable environments and social systems that privilege able bodies, often resulting in discrimination or exclusion (Gabel, 2005). Likewise in K-12 settings, the expectation is that students with disabilities should somehow be normalized; the teacher's role is to remediate students with individual education programs (IEPs) in order to make them more like their "typical" peers. Ironically, this often happens by removing these students from the classroom and attempting to raise them to a "normally" performing level before readmitting them in the general classroom (Hehir, 2002; Taylor, 1988).

The UDL framework can disrupt the narrative of achieving readiness as a gateway to inclusion (Taylor, 1988), as it recognizes learner variability as an educational norm, and rejects the "myth of the normal child" as the central, organizing feature of schools (Baglieri, Bejoian et al., 2011, p. 2124). Yet due to its complicated history and development, UDL continues to be positioned in research, as this paper will illustrate, as a solution for dealing with disability or difference. A number of descriptive and empirical publications included in this review begin by framing their pieces as a response to increased diversity in IHEs, which, while admirable, runs the risk of positioning non-dominant (non-white, disabled, etc.) groups of students as (1) homogeneous, and (2) deviants in need of assimilating to heteronormative standards that define typicality in higher education.

This paper critically questions the suitability of framing UDL as an intervention for improving outcomes for certain groups of students in the increasingly diverse realm of postsecondary education. Instead, we argue that UDL is a process-based framework for inclusive pedagogy that moves "beyond assimilationist and compensatory measures of support with a view to advancing inclusive forms of pedagogy to meet learner diversity in non-discriminatory and socially just ways" (Liasidou, 2014, p.127). In other words, rather than conceptualizing inclusion in higher education as accommodating students with disabilities, UDL as inclusive pedagogy takes up the task of transforming teaching and learning at the postsecondary level for all students. This is a task made more complex by the fact that many faculty are content experts with limited pedagogical experience, other than their own as a student (McGuire

et al., 2006). Thus, a further goal of this paper is to propose avenues for future research. This will be explored further in the discussion.

Methods

Criteria for Locating and Selecting Publications

In order to locate high-quality publications, we conducted a search of the Education Resources Information Center (ERIC) database using the following key terms: “Universal Design for Learning” or “UDL,” combined with either “higher education” or “postsecondary education.” This initial search yielded 247 articles. The abstracts of these articles were read and applied the following criteria for inclusion in this review:

1. Articles must be published in a peer reviewed journal.
2. Articles must be published between 2002 and 2018. The 2002 date reflects the publication of *Teaching Every Student in the Digital Age: Universal Design for Learning* (Rose & Meyer, 2002), which introduced principles of UDL.
3. Publications must explicitly address our research questions; thus, they need to explore how UDL is operationalized and/or conceptualized in a postsecondary setting.
 - a. Operationalize refers to publications that explore the process of drawing on and implementing UDL in some aspect of pedagogy, coursework, or operations (e.g., Disability Services Office). Publications in this group asked questions about the process and/or outcomes of designing a course, system, or learning task within the context of the UDL framework.
 - b. Conceptualize refers to publications that draw on UDL theory to consider ways to improve teaching and learning in higher education. These pieces explored questions about how faculty and students consider the possibilities of UDL in a postsecondary setting, including how faculty might take up UDL in the interest of improving their pedagogy.
4. Publications must focus specifically on Universal Design for Learning. Articles that focused on other UD models (e.g., Universal Design for Instruction) to the exclusion of UDL were not reviewed.
5. Publications must display evidence of drawing on UDL principles in a postsecondary

context; pieces that incorporated UDL as content within a course (for example, teaching pre-service teachers about UDL) were excluded (e.g., Pearson, 2015).

Analysis

The resultant set of 38 publications spanned the years 2006 to 2018 and included empirical research studies and descriptive articles. After reading the articles, each one was logged into a spreadsheet in which we recorded the abstract, purpose, research questions, methods, data sources, and findings. The first author coded each article to identify those that dealt with operationalizing UDL, and those that explored its conceptualization. Upon reviewing the first author’s provided definitions specific to the operationalization and conceptualization of UDL, the second author also coded each article. The authors were in agreement on 82% of the articles, and discrepancies were resolved together; several articles could be interpreted as involving both the operationalization and conceptualization of UDL (e.g., Black et al., 2014; Hutson & Downs, 2015). In these cases, the authors revisited the publication’s stated purpose and when explicitly identified by the authors, the research questions. Definitions of operationalize and conceptualize were consulted to determine which category most clearly aligned with the article’s stated purposes. A list of articles in this review, organized by category, is provided in Table 1.

Findings

Almost all of the publications in this review began by addressing UDL in relation to increasing student diversity, broadly defined, in higher education. While many pieces explicitly linked UDL to the teaching and learning of students with disabilities, others framed UDL as a way to address the needs of a diverse population of students, including variability in age, social and cultural backgrounds, and learning preferences. We will review findings in this section, focusing first on how UDL has been operationalized, and then on its conceptualization in higher education settings.

Operationalizing UDL

Recall the first research question: In what ways is the UDL framework operationalized in postsecondary contexts? A total of 27 articles in this review attended to operationalizing UDL principles through some type of implementation in instruction, assessment, or design. Two themes emerged from analysis of these articles: (a) use of UDL in

response to a specific problem, and (b) achieving philosophical “buy-in” from faculty, stakeholders, and students in order to move forward with scaling UDL across the institution.

A recent study of UDL implementation across six IHEs in the US (Moore et al., 2018) provides a model that can be used as a heuristic for understanding the themes in this subgroup of the literature. Moore and colleagues aimed to identify similarities and differences in implementation strategies, and to use this information to inform the scaling of UDL research and practice. Through interviews with faculty across selected IHEs, the authors found that UDL was often addressed most systematically in response to a particular problem or line of inquiry, such as inequity or student attrition, which parallels theme (a) in our review. This targeted use of UDL to address a particular problem may have been the result of greater “buy-in” from certain administrative areas or departments concerned with that issue, which corresponds to theme (b). Drawing on their collected data, Moore et al. developed a four-phase model to help identify the developmental arc of UDL implementation in higher education: small, often individual-level implementation; traces of growth through the department level; securing of funding; and institutional implementation and adoption of UDL as policy. We will refer to this model and examples from the review literature to illustrate the two themes.

UDL: Responding to Problems. Looking across these studies, several publications did in fact frame UDL as a potential solution to a problem or issue in higher education. In many cases, the “problem” in need of attention was the success (or lack thereof) of students with labeled disabilities. For example, some studies examined aspects of equity and access in college or university coursework. In other cases, instructors identified common challenges within their courses or departments. Moore and colleagues (2018) noted that in some IHEs, the emphasis on UDL is at a faculty level, where concerns tend to reflect those of individual faculty members and a commitment to students and promising pedagogy. At a systems (university) level, there tends to be interest in addressing larger issues such as student attrition, racial tension, or access to disability-related services.

Several studies found that attending to faculty’s instructional practices might enable access to learning for a variety of diverse students, including those with disabilities, and facilitate inclusive classrooms (Bernacchio et al., 2007; Gradel & Edson, 2010; Heelan et al., 2015). Similarly, one study assessed faculty perceptions of UDL, and subsequently designed a professional learning program aimed at creating an

inclusive climate specifically geared toward students with disabilities (Izzo et al., 2008). These studies suggest that use of UDL principles may mitigate faculty concern about teaching students with labeled disabilities, who may be perceived as having fundamentally different learning needs.

True to UDL’s emphasis on student learning, several publications focused on postsecondary students’ perceptions of UDL implementation. Dean et al. (2017) zeroed in on the student outcomes of perceived learning (e.g., whether students were positively engaged) and actual learning (knowledge gains). The faculty researchers investigated the impact of using multiple forms of representation in a large lecture course. These resources including PowerPoint slides, lecture notes, an audience response system, and an online learning app. Notably, the problems under investigation (lack of engagement and limited opportunities to learn in large lecture) are environmental and curricular; the authors do not situate problems within students.

In general, research that examined student perspectives tended to focus more on systemic or curricular barriers that UDL might address, rather than attempting to overcome deficits in learning ascribed to disability. Two studies looked at student perspectives on instruction before and after a UDL intervention with members of the faculty (Davies et al., 2013; Schelly et al., 2011). Researchers saw a shift in student perceptions about how their instructors shared information and attempted to engage and assess them. These researchers attempted to measure UDL effectiveness through students’ eyes and offer an interesting glimpse into the perceived positive impact of even a small amount (semester’s worth) of faculty professional learning on student outcomes.

Several publications in this subgroup took up the work of connecting UDL with student wellness, empowerment, and identity development in college classes. Nielsen (2013) examined how UDL might be integrated into a composition course for first-year college students to foster positive identity development (knowing oneself as a learner) and engagement. The author focused specifically on highlighting UDL as a useful framework for design for all students, not only those who might struggle in a composition course. This piece highlights how instructors can proactively address variability in the classroom, an approach consistent with the principles of UDL. In addition, student empowerment was highlighted across content areas in one study exploring UDL as a means to minimize the barrier of student stress, and foster an inclusive climate (Miller & Lang, 2016), and another to increase student-centered learning and engagement

(Kumar, 2011). Again, this is approached by proactive design and faculty training, not only in pedagogy, but in identifying and removing barriers to learning (Meyer et al., 2014).

Because UDL is defined as a pedagogical framework, it is increasingly being used in teacher education programs, both to prepare teachers for diverse classrooms, and as a set of promising instructional practice (Pearson, 2015). Studies focused on the use and introduction of UDL in teacher education also highlighted its use in online or hybrid course formats. While the use of faculty modeling as a way to introduce UDL was employed in one study (Evans et al., 2010), the focus of these pieces tended to be on how well preservice teachers understood UDL after not only learning about it, but participating in UDL-designed courses (Evmenova, 2018; Scott et al., 2015). While results indicate that preservice teachers were generally able to recognize and apply UDL principles, we must note two important points. First, participants in these studies tended to be preservice special education teachers, highlighting again the connection between UDL and special education. Second, we were unable to locate studies that explored the use of UDL with preservice teachers in clinical placements, indicating a possible gap in research.

Investigating UDL as a vehicle for improving online or technology-enhanced postsecondary courses was a popular topic in this subgroup. While UDL neither requires the use of technology nor relies solely on it to enhance pedagogy, implementation is certainly facilitated by the use of electronic media, assistive technology, and accessible educational materials (Meyer et al., 2014). Several recent articles emphasize these links between UDL and technology, particularly as a tool for designing engaging online courses or communication platforms (Basham et al., 2010; Lohmann et al., 2018). Others explored increasing accessibility of online courses (Scott & Temple, 2017) or tutorials (Webb & Hoover, 2015), and decreasing attrition in these courses (Tobin, 2014). Despite the prevalence of online coursework, barriers within them continue to arise, and instructors must attend to the preferences of students. For example, a case study by Rao and Tanners (2011) examined not only the design of courses using UDL to mitigate these problems, but also evaluated which elements of UDL design were perceived as most useful by students. The authors found that interaction among students and instructors increased engagement, and that providing options for expression of learning also yielded positive perceptions. Rao and Tanner's piece is an important one, as it highlights the fact that merely using technology does not mean UDL is being em-

ployed; rather, UDL should be used to intentionally and proactively design courses that facilitate learning that allows for variability in expression, representation, and engagement.

On a somewhat larger scale, UDL implementation has been explored at a macro-level, across academic departments. Several studies took up the problematic nature of how disability is typically handled on campus – that it is a problem with which to deal. For example, a study by Beck et al. (2014) looked at how a Disability Services office on a large college campus could align its offerings within a UDL framework. The authors found that the office, although aimed at facilitating learning and accommodations for students with disabilities, in fact created a number of physical and modal barriers through their practices. They urged not only a practical change, but a philosophical, reflective, and continuous consideration of their model, and ways to move from intervention on behalf of students to intentional support of faculty and system design. A study by Fovet et al. (2014), analyzed the outcomes of an extended effort to implement UDL on a college campus. Faculty indicated that the process included a number of stressors, including budgetary concerns, depleted resources, and assumptions about an increase in workload. However, the researchers found that increased collaboration among staff eased some of these stressors, and that faculty appreciated the sense of ownership in redesign. An assessment of the College Supporting Transition, Access and Retention program (College STAR) found similarly positive results regarding faculty and staff collaboration and ownership (Hutson & Downs, 2015). These pieces suggest the development of a shift in mindset of teaching and learning in higher education, toward problematizing traditional views of disability. Rather than thinking about ways to “deal with disability,” proactive approaches to inclusive design are fostered through UDL implementation at a systemic level.

Using UDL to address specific problems and act as a “catalyst for change” was referred to by one of Moore et al.'s participants as a “Trojan horse” (p. 42). Trojan horses refer to specific issues that might open the door for UDL as a solution. Such issues, whether systemic issues related to equity and inclusion, or more discrete pedagogical concerns of faculty (e.g., engagement), were evident across this subgroup of literature. Whether employed as a macro-level administrative solution or only within a sole instructor's classroom, these articles indicate the prevalence of UDL as a potential way to address a range of challenges in higher education settings.

Moving Forward: UDL Buy-In. Several publications focus on moving UDL implementation for-

ward in some way, which typically involves some type of scaling of UDL implementation. Moore and colleagues (2018), while laying out suggestions for levels and processes involved in scalability, make an important point that is particularly relevant to articles described here: “scaling up at its most fundamental level may be conceived as winning the hearts and minds of an ever-expanding group of individuals and providing the support structures necessary to sustain them” (p. 49). These publications recognize the necessity of some degree of philosophical buy-in on the part of faculty, students, and other stakeholders to recognize learner variability as the norm. In other words, because UDL is not a program, it cannot be treated like a checklist of strategies focused only on getting learners to access the curriculum. While it is conceivable that one could “do UDL,” by implementing multiple means of engagement, representation, and action of expression into classroom practice, this approach lacks the intentionality that is characteristic of UDL, the connection with an instructional goal, and the focus on student variability in a particular context (Lowrey et al., 2017).

Several studies examined how students might buy in to UDL, as experienced through participation in a course where it was implemented by faculty. Kumar and Wideman (2014) examined implementation in a first-year undergraduate course, and student perceptions were generally positive. Students appreciated the flexibility in course design and assignments and felt that it contributed to their learning and higher grades than they would have otherwise had. Faculty reported that taking the time to consider multiple means of presentation gave them an appreciation for other ways of learning that would address learner variability. Likewise, Smith (2012) found that both faculty and students reported higher levels of engagement during a UDL-framed course, and the relationship was somewhat reciprocal; in other words, higher student engagement fostered more engagement on the part of the instructor to link practice with multiple means of motivation. Buy-in from both faculty and students may suggest opportunities for scaling UDL that would facilitate sustainability within a program or institution.

As noted in the previous section, instructors often draw on UDL in designing online courses to increase both access and engagement. Two publications, while focused on design of such courses, employed a UDL mindset not only as a means, but as a socially just end. This is an important shift. Rogers-Shaw et al. (2018) described their process of redesigning the syllabus, assessments, and communication, and offering choices in their course for adult learners that not only

increase access, but also urged them to reflect on their own assumptions as they applied UDL principles. Likewise, Morra and Reynolds (2010) acknowledged similar shifts in their design of technology-enhanced courses, noting that practical shifts must be accompanied by philosophical changes in beliefs about learning. Only then, they argue, will UDL truly facilitate inclusion of students who have traditionally been marginalized on college campuses.

This subgroup of literature suggests that UDL is being operationalized in a variety of ways, in response to a range of challenges, and is doing so with varying degrees of support across postsecondary settings. While findings of this group of literature reflect a spectrum of reasons for implementing UDL, it is important to highlight the presence of the common thread also noted by Moore and colleagues (2018): human buy-in – from faculty, students, and stakeholders across the system – will ultimately determine not only the scale of implementation, but its success and sustainability.

Conceptualizing UDL

Our second research question sought to understand the ways in which faculty and researchers in higher education conceptualize UDL. This subgroup of literature includes conceptual, descriptive, and empirical pieces. Overall, across these articles, researchers conceptualize UDL as a framework for inclusive pedagogy or instructional design, often leveraging technological innovations to meet the needs of a diverse student population, including those with labeled disabilities.

Several publications examined philosophical underpinnings of UDL, either to disrupt the discourse of normalcy that tends to undergird instructional and pedagogical practices in higher education (Liasidou, 2014) or to conceptualize how the framework might address issues of inequity or exclusion in higher education. While issues of pedagogy, design, and equity were incorporated into studies addressed by the first research question, these pieces are distinct in that they are not focused on practical implementation of UDL. Rather, publications in this group focus on either faculty or student perceptions and understanding of UDL in postsecondary settings.

Some of this work appears to be situated within a critical or social model of disability. The social model was conceptualized by Oliver (2013) as an alternative to the dominant medical model, which defines disability as an individual deficit. Social models situate the dominant view of disability as one created by the economic and social forces that render certain types of bodies as deficient and subsequently less de-

sirable (Baglieri, 2019). Versions of the social model have been explored by educational scholars who have problematized the narrow understanding of individual disability in educational settings and attempted to deepen the impact of reframing teaching and learning within a more social framework (Baglieri, 2019; Linton, 1998). That said, viewing disability solely as a social phenomenon, and denying the experiences of disabled individuals is also problematic; Some researchers have suggested that UDL must be careful to acknowledge the reality of disability and the disablement process, without erasing disability as a positive element of identity (Dolmage, 2015).

The role of support services for students with identified disabilities complicates execution of a social model, as several of these pieces explore. Liasidou (2014), for example argues that such services, which often serve to ensure that students are receiving reasonable accommodations serve to further marginalize and stigmatize disabled students. Accommodations often involve retrofitting assignments or assessment, and do not consider the experience of the disabled individual at the outset. This function, she argues, upholds the discourse of normalcy requiring students to self-disclose potentially stigmatizing information that perpetuates the myth of disability as a deficit in need of remediation so that one can become normal. This finding was echoed by Fovet and Mole (2013), whose qualitative study found that UDL offered faculty a common language with which to approach a diverse student body, not solely as a vehicle for service delivery or accommodations related to disability. Thus, these two pieces offer a model for conceptualizing UDL beyond Disability Services or even in response to a “problem,” and instead consider it as a way to transform higher education into a more inclusive and equitable space.

Several studies attempted to understand perceptions of UDL, and beliefs about disability or related accommodations. For example, Black et al. (2014) identified teaching practices consistent with UDL at a university, and also explored faculty attitudes toward students with disabilities. They found that faculty with limited or some training in UDL had no significant effect on the frequency of incorporating UDL principles, but those with more experience tended to incorporate UDL more consistently. Studies exploring student perceptions had slightly different findings. While a study from Belgium indicated that consistent application of UDL may actually create barriers for students without disabilities (Griful-Freixenet et al., 2017), a study by Black et al. (2015) highlighted UDL’s applicability for a variety of students, emphasizing that simply adding accommodations for

disabled students does not go far enough to support them. These studies suggest that positive perceptions of UDL may require a shift in mindset in order to facilitate buy-in and sustainability. In other words, negative views toward students with disabilities or those requiring accommodations can act as a barrier for successful implementation of UDL. As with literature on operationalizing UDL, these attitudes tend to be a key component of conceptualizing UDL as a positive force in higher education.

The remaining pieces we will discuss focused on the “why” behind UDL. These pieces, while conceptualizing UDL as a broad solution to poor learning outcomes in higher education, make the case for embracing UDL in a variety of ways. While several of these focused on facets of instructional design (Vininsky & Saxe, 2016; Williams et al., 2013) and neuroscience (Schreiner et al., 2013), others emphasized student learning as the conceptual focus of UDL. One of the earliest publications was a conceptual piece that essentially offered a primer for faculty on how to incorporate UDL into assessment (Ofiesh et al., 2006). Suggestions included backward design, so that instructors ensured they were teaching what they intended to assess, and a list of ways to make assessments themselves accessible through visual design of images and text, clear language, and layout. In addition, this piece, along with a seminal piece by CAST co-founder David Rose and colleagues, focuses on student learning (Rose et al., 2006). These publications get at the crux of why UDL is markedly different from accommodations: UDL theory proposes a more transformative approach to creating instructional environments that promote learning, over individualistic approaches traditionally associated with remediation of disability. Furthermore, an update of Rose and colleagues’ (2006, 2008) piece published in 2015 highlights the changes made not only to course designs, but to UDL theory at large (Gravel et al., 2015). The iterative nature of UDL suggests that neither implementation nor conceptualization of UDL is a static event, but rather a process of continuing reflection and refinement as the landscape of postsecondary education continues to develop and change.

Discussion

The pieces included here represent a diverse field of research on the implementation and conceptualization of UDL in higher education. UDL’s iterative nature suggests a willingness on the part of those who take it up to create and sustain inclusive environments, and in some cases to acknowledge established

norms of ability and access within higher education. While many cases can be made for the employment of UDL, either as a response to challenges or as an end in and of itself, the literature discussed here suggests that UDL is interpreted by many as a framework and by others as an intervention. In addition, its use as a way to facilitate inclusive pedagogy and disrupt the normative center of education, while evident in theory (e.g., Baglieri, Valle et al., 2011; Meyer et al., 2014), has yet to be consistently explored in UDL literature.

UDL: Intervention or Framework?

In many publications across the two subgroups of literature UDL was depicted as a response to a particular problem or line of inquiry. Recognizing that in some cases such an approach may result in wider buy-in from faculty and administration, or a more cohesive agenda for change (Moore et al., 2018), potential drawbacks also exist. UDL's use as an intervention to ameliorate a problem may further complicate productive use of UDL, as interventions are traditionally done *to* students *by* instructors, or *to* curriculum *by* faculty; the emphasis remains on the teacher rather than the learner, which gets away from the purpose and aims of UDL. Another possible drawback of framing studies in response to the problem of struggling students with disabilities, is that the notion that there is some internal deficit in the students that UDL can fix is perpetuated; issues of design are neglected.

This concern was echoed by CAST researchers in 2015. Revisiting Rose et al.'s (2006) work specific to UDL in higher education, Gravel and colleagues (2015) recognized that the previous piece had still situated problems with learning partially in the learner and partially in the environment; they amended this view in their conclusion. Stating their discomfort with emphasizing problems within individuals, Gravel et al. asserted that "It is our learning environments, first and foremost, that are disabled. Addressing the disabilities in the learning environment... will make courses that are better not just for students with disabilities, but for all students" (p. 99). This shift in framing disability suggests a move away from a deficit-based perspective and illustrates the continually evolving understandings of UDL. We agree with Gravel et al. and others (e.g., Waitoller & King Thorius, 2016) that UDL theory and research can and should do more to challenge existing notions of ability and normalcy across educational contexts.

We highlight Gravel et al.'s (2015) chapter here because it focuses on the process of conceptualizing and operationalizing UDL. Furthermore, we concur with scholars Disability Studies in Education (Dolmage, 2017; Mitchell et al., 2014) who argue that

UDL provides the opportunity to foreground disability in designing curriculum and pedagogy. In other words, UDL can compel faculty to consider a "systematic negotiation of needs across any assembly of student differences" as they design their courses and instructional materials (Mitchell et al., 2014, p. 309). Unpacking the history of Universal Design in higher education, Dolmage (2017) also emphasized this active part of UDL: the design process.

This active dimension suggests that UD is a way to plan, to foresee, to imagine the future. The "Universal" of UD also suggests that disability is something that is always a part of our worldview. Thus, when UD is successful, it is hopeful and realistic – allowing teachers to structure space and pedagogy in the broadest possible manner, Universal Design is not about buildings, it is about building – building community, building better pedagogy, building opportunities for agency. It is a way to move. (p. 118)

Conceptualizing UDL as a response to problems caused by the presence of certain students is inherently limiting; it focuses only on particular groups of students. The promise of UDL in higher education is in its possibility; the process allows us to imagine not only making access universal, but learning as well.

Positioning UDL as a process-based framework rather than an intervention allows us to acknowledge disabling environments and center the lived experiences of students with disabilities in our design. Furthermore, IHEs can incorporate variation not only in perceived ability, but in language, race, gender, etc., without assuming the default position of a heteronormative, able-bodied individual as the standard toward which a UDL intervention could remediate students.

Disrupting the Discourse of Normalcy

Publications in both the operationalizing and conceptualizing strands address the philosophical shift raised by Moore and colleagues (2018) that mentioned winning the hearts and minds of faculty. Implementation within an institution cannot be a practical project alone, and in order to be effective will require some reconceptualization of ability, disability, and variability. These concepts, it seems, are murkier in higher education than in K-12, where notions of ability and disability are highly normed and regulated (for better or worse) and often discussed as a result of special education.

Still, winning hearts and minds does not seem to go far enough to yield a philosophical shift that would truly disrupt a discourse of normalcy and result in in-

clusive pedagogy. For example, Beck and colleagues (2014) considered that, as faculty are in positions of power within IHEs, attending to their re-conceptualizations of who is normal and able is critical; normalizing discourse is easily internalized by both faculty and students. As a result, critical elements need to be embedded into the process of UDL adoption (Liasidou, 2014). Some scholars have suggested that UDL must actively dismantle ability-centric practices that permeate formal education (Waitoller & King Thorius, 2016). In higher education, such practices are so deeply ingrained into institutions based on perceived levels of ability that it is taken-for-granted as normal. Instead of simply trying to remove barriers to learning for certain students (such as those with disabilities), the existence of the barriers must first be questioned, and the sources of their existence identified (Waitoller & King Thorius, 2016).

There is limited evidence from articles in this review that UDL in higher education is being conceptualized as an avenue for inclusive pedagogy that considers educating students with diverse abilities as a justifiable end, student variability at the outset of course design, and disability as an asset. This is not altogether surprising, as UDL research in general is still at an emerging stage with regard to both K-12 teachers and university faculty. Yet the variety of UDL research illustrated here suggests that there is growing interest in transforming access and pedagogy in postsecondary settings, and in disrupting limited interpretations of inclusion that rely solely on accommodations. It seems appropriate to consider what an inclusive pedagogy might look like within courses, programs, and departments, and how faculty might draw on elements of the UDL framework to design an intentional approach that continues to evolve with an ever-changing student body, and new developments in research.

Implications

There are several important implications here for further research. First, because UDL has been clearly defined through work from CAST, researchers drawing on CAST's framework should take care to be consistent in descriptions of UDL concepts, principles, and guidelines. Such consistency would serve to demonstrate the many ways UDL might be used across a number of different contexts, and further emphasize that UDL can be adapted to meet the needs of highly variable student populations. This means staying true to an emphasis on variability and inclusiveness, rather than disability and intervention. While, in the climate of accountability, there is a temptation as

well as a need to examine outcomes of UDL, focusing solely on the effects of UDL as an intervention compromise its intention as a framework.

Because UDL theory is consistent with elements of the social model of disability, further empirical research linking the fields of disability studies and UDL in higher education is warranted. The prevalence of ability as the central axis of teaching and learning within postsecondary settings must be critically examined and disrupted, and UDL offers a practical approach for taking up this work. Furthermore, the perspectives of scholars and students with disabilities need greater representation in order to understand how and if UDL can operate as a framework that acknowledges disability as an agentive and positive aspect of identity (Dolmage, 2015).

In addition, the research presented here suggests room for growth in the scope of UDL practice. Much of the work has been done within departments or colleges of education at the postsecondary level. This is unsurprising, given that faculty in education likely have the most experience with both pedagogy and student variability. That said, there is a great opportunity for UDL research in other disciplines, particularly those which may have historically prioritized content.

Lastly, the interpretation of UDL in higher education here is further limited by instructional methods and environments. And yet learning happens in so many settings in higher education: in meetings, at events, through operational systems. More research needs to be conducted at a systems level. In other words, how might we go from simply adopting the UDL framework to intentionally grounding our core beliefs in UDL theory and practice - as instructors, programs, department, and institutions? UDL should not be limited to the classroom, and its sustainability is dependent on those who embrace it, extending it into the broader social realm to increase inclusive pedagogies in both formal and informal ways.

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Table 1*Articles Exploring UDL in Postsecondary Education, Purpose, and Category, n=38*

Publication	Purpose	Category
Ofiesh, Rojas, & Ward (2006)	To present recommendations from the field of universal design as they apply to assessment of students at the postsecondary level	Conceptualizing
Rose, Harbour, Johnston, Daley, & Abarbanell (2006)	To clarify the differences between applying universal design in built vs. learning environment (both the theory and techniques), and to illustrate the principles of UDL	Conceptualizing
Bernachhio, Ross, Washburn, Whitney, & Wood (2007)	To study process and results of engaging in a critical friends group that models reflective practice in establishing and maintaining access and inclusion in classes	Operationalizing
Izzo, Murray, & Novak (2008)	The study and development of training materials to improve the quality of postsecondary education for students with disabilities	Operationalizing
Basham, Lowrey, & deNoyelles (2010)	To explore an instructional design that used UDL to proactively plan for computer-mediated communication as a means of student engagement, representation, and expression through reflection on key issues in special education	Operationalizing
Evans, Williams, King, & Metcalf (2010)	To provide examples of how they integrate and model UDL in courses in assessment, classroom management, and instructional planning, and how preservice teachers demonstrate their knowledge of UDL in assignments with students in K-12 settings.	Operationalizing
Gradel & Edson (2010)	To identify beginning strategies and models for implementation of UDL in higher education, while also addressing challenges	Operationalizing
Morra & Reynolds (2010)	To explore how UDL principles and options influence technology-enhanced (hybrid and online) courses	Operationalizing
Kumar (2011)	To describe implementation of a mock conference model of instruction aligned with UDL and learner centered instruction	Operationalizing
Rao & Tanners (2011)	To examine how guidelines of two UD models can be considered during the instructional design process and applied in an online course, and to determine which elements of these models were most valued by and useful to students enrolled in the online course.	Operationalizing
Schelly, Davies, & Spooner (2011)	To measure the effectiveness of instructor training in UDL (as indicated by student perceptions)	Operationalizing

Publication	Purpose	Category
Smith (2012)	To examine the reflective practice of one faculty member as she applied the UDL framework to her graduate class	Operationalizing
Davies, Schelly, & Spooner (2013)	To compare student survey data about an intervention group of instructors who received UDL training to student survey data from a control group of instructors who did not receive UDL training. This study features a revised and expanded survey instrument	Operationalizing
Fovet & Mole (2013)	To offer a “methodological snapshot” of an IHE’s process of UDL implementation, and consider the outcomes observed beyond the parameters of disability services (incorporating observations from faculty, administrators and students)	Conceptualizing
Nielson (2013)	To analyze the process and complications of incorporating UDL into a first-year composition course to foster independent student identity	Operationalizing
Schreiner, Rothenberger, & Scholtz (2013)	To summarize research in neuroscience, cognitive psychology, and education as related to universal design and to provide ideas for improving college teaching	Conceptualizing
Williams, Rice, Lauren, Morrison, Van Winkle, & Elliott (2013)	To reimagine both pedagogical and physical space of the traditional classroom by linking UDL and theories of problem-based learning	Conceptualizing
Beck, Diaz del Castillo, Fovet, Mole, & Noga (2014)	To explore the impact of UD implementation for Disability Service providers’ users	Operationalizing
Black, Weinberg, & Brodwin (2014)	To determine if faculty were incorporating UDI/UDL into their instruction, and faculty attitudes toward students with disabilities	Conceptualizing
Fovet, Jarrett, Mole, & Syncox (2014)	To highlight how implementation of UDL requires increased collaboration among staff, including disability service providers, equity and diversity services, and teaching and learning support	Operationalizing
Kumar & Wideman (2014)	To understand the impact of integrating UDL principles into a postsecondary course	Operationalizing
Liasidou (2014)	To highlight the ways a social justice discourse needs to be incorporated into debates about widening participation in higher education on the grounds of disability. Emphasis on UDL as a vehicle for socially just change in higher education	Conceptualizing
Tobin (2014)	To offer strategies to create and convert courses to online format to increase access and engagement	Operationalizing
Black, Weinberg, & Brodwin (2015)	To evaluate perspectives of university students with disabilities on teaching methods that benefited their learning to evaluate whether these align with UDL or UDI	Conceptualizing

Publication	Purpose	Category
Heelan, Halligan, & Quirke (2015)	To provide examples and potential for UDL in health sciences	Operationalizing
Scott, L. A., Temple, P., & Marshall, D. (2015)	To examine perceptions of special education teachers enrolled in online courses as to whether courses were aligned with UDL principles, and whether the course design improved the teachers' preparation	Operationalizing
Hutson & Downs (2015)	To describe changes occur in use and knowledge of UDL principles among the faculty who participate in faculty learning communities	Operationalizing
Webb & Hoover (2015)	To examine effectiveness of a biology tutorial available by research librarians, drawing on UDL - for students w disabilities	Operationalizing
Miller & Lang (2016)	To provide an introduction to some of the specific mental health issues that students may face in a science lab context and to draw on UDL application in the lab to reduce student stress	Operationalizing
Vininsky & Saxe (2016)	To develop and propose an inclusive and accessible blended teacher education program guided by the Universal Design for Learning (UDL) framework.	Conceptualizing
Dean, Lee-Post, & Hapke (2017)	To address these pedagogical issues of large lecture courses by creating a learning environment that builds on the Universal Design for Learning (UDL) principles with the goal of providing diverse learners with options in representation, engagement, and expression	Operationalizing
Griful-Freixenet, Struyven, Vers-tichele, & Andries (2017)	To explore whether or not the needs of the students with disabilities, taught within the traditional higher education model, are addressed effectively by the UDL principles.	Conceptualizing
Scott, Thoma, Puglia, Temple, & D'Aguilar (2017)	To determine what is currently being done to prepare educators to implement a UDL framework, the extent to which a UDL framework is being incorporated into preservice courses in higher education, and how a UDL framework is being used to improve postschool outcomes for youth with ID.	Conceptualizing
Scott & Temple (2017)	To present ideas for consideration when designing online courses (particularly those in special education) for preservice teachers	Operationalizing
Evmenova (2018)	To extend previous research and explore how experiencing UDL firsthand in a graduate online course might help educators, including in-service general and special education teachers, learn about UDL framework and plan for its practical implementation	Operationalizing

Publication	Purpose	Category
Lohmann, Boothe, Hathcote, & Turpin (2018)	To explore the impact of implementing UDL to increase engagement with preservice teachers in online format	Operationalizing
Moore, Smith, Hollingshead, & Wojcik (2018)	To explore how UDL may improve teaching and learning in teacher education and to develop a model for implementation in IHEs	Operationalizing
Rogers-Shaw, Carr-Chellman, & Choi (2018)	To explain the history and philosophy of UDL, as well as practical application in building accessibility for all in online courses	Operationalizing

Virtual Self-Advocacy Training Development for Freshmen Students with a Documented Learning Difference (Practice Brief)

Morgan L. Russell¹
Denise Pearl¹

Abstract

Using the definition of self-advocacy from M. E. Skinner (1998) as the conceptual framework, and the Self-Advocacy and Conflict Resolution Training developed by Palmer and Roessler (2000) as the foundation, the researchers solicited feedback on the construction of an abbreviated virtual self-advocacy training for traditional freshmen college students with a learning difference with pre- and post-survey data collected at three, four-year public institutions. The purpose of the Keys to Self-Advocacy Training developed for this study was to provide a program to help address the challenges these students encounter while navigating the postsecondary disability accommodation process to gain access to appropriate academic accommodations needed for degree completion. The term “learning difference” was used in the training and this brief as a means to promote positivity around disability terminology. Students participating in this particular training demonstrated improvement in self-advocacy knowledge ($\Delta=0.33-1.00$) after viewing one of the training videos.

Keywords: learning difference, learning disability, self-advocacy

Given the importance of academic accommodations in connection to a student’s academic success, self-advocacy training should address how students should discuss their needs concerning the learning difference and what accommodations best suit any deficits associated with the diagnosis of specific learning disorder. While the Palmer and Roessler (2000) study is somewhat dated, it provides a foundation for several trainings on this issue including the Keys to Self-Advocacy training developed for this study. The researchers facilitated an eight-hour in-person training for 24 participants, which included a post-training paper quiz and behavioral rating scale assessing disability accommodation knowledge and understanding of target behaviors exhibited. The treatment group ($N = 26$) received training and then a paper quiz while the control group was not given the opportunity to participate in the training, but given the post-training quiz only. The outcomes showed that students with disabilities improved their knowledge of accommodation rights and responsibilities as a result of the Self-Advocacy and Conflict Resolution Training. Participants also indicated that they believed themselves to be more capable of successfully requesting accommodations and more able to resolve conflict.

In creating a self-advocacy intervention program for postsecondary African-American students, Walker and Test (2000) utilized a mixed media approach with a training video and face-to-face role play for three African-American college males to assess their growth in requesting accommodations. The face-to-face training included a 48-minute training video concerning transitioning for students with ADHD/ADD and learning differences/disabilities as well as a role play workshop utilizing some of the same behaviors from the Palmer and Roessler (2000) study. Results of the student questionnaire indicated that each student felt the self-advocacy intervention had a positive effect on their ability to self-advocate by requesting accommodations in the academic setting. Researchers concluded that each student reached mastery criterion of self-advocacy skills within three days and performed between 73-91% of the target behaviors after the one-week maintenance check-up. In both Walker and Test, and Palmer and Walker’s research, the notion of face-to-face training has been shown to impact students’ knowledge and understanding of self-advocacy and its components.

In a more recent study by White et al. (2014), knowledge-based online and skills-based training

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was also used to see how students' ($N=52$) knowledge of self-advocacy could be improved by participating in a training program. The knowledge-based online training included an electronic pre- and post-test that addressed knowledge of rights, self-assessment of accommodations, and self-assessment of strengths and challenges presented by their learning difference. Scores from the knowledge-based online module rose from 67% to 85% of correct advocacy skills noted after watching the training video. The knowledge-based online training proved to be an effective approach to helping students obtain information on disability-related legislation and types of accommodations students may request.

Depiction of Problem

Under current transition plans for students with Individual Education Plans (IEP), many students with disabilities leave high school without the self-advocacy skills they need to survive in college (Eckes & Ochoa, 2005). The characteristics of self-advocacy have been known to allow people the ability to assert themselves in a situation of conflict or advocate in a scenario where they may feel disadvantaged or discriminated against. According to Test et al. (2005), knowledge of self and consciousness of rights are viewed as the foundations of self-advocacy because they are necessary for individuals to understand and know themselves before they can tell others what they need. Unfortunately, without participating in training to gain self-advocacy skills, the ability to navigate and fully explain their learning difference and how it affects them in and out of the classroom or in social settings can become problematic and not allow students to have access to accommodations that meet their needs. Lack of self-advocacy skills is linked to low completion rates for any type of college from 41% for a student diagnosed with any disability compared to 52% of all young adults (Horowitz et al., 2017). Considering the extended degree completion time for individuals with learning differences, they have also experienced poorer post-school outcomes than those without disabilities; evidence suggests that despite some improvement, these disparities persist (Haber et al., 2016).

Institutional Partnerships and Participant Demographics

The virtual Keys to Self-Advocacy training was conducted at three public, four-year institutions of similar size, generating a 67-person invited population. The three institutional partners were identified

via email recruitment that was sent to over 20 disability services providers at four-year institutions, at which time the three disability directors at their respective institutions agreed to allow their population of students to participate. Target participants for the virtual self-advocacy training was a first-time freshman ages 17-23 and attending college full-time, meaning enrolled in 12 or more credit hours. All the student participants had a formal diagnosis of specific learning disorder, not otherwise specified, and had to be registered to receive accommodations through the institution's office of disability services. There were six student participants (9% of those invited), 50% (3) were Caucasian, 16% (1) was a Pacific Islander, and 33% (2) were mixed race. Concerning gender, 33% (2) identified as female and 66% (4) identified as male.

Description of Practice

With over six years of experience as a disability services provider both at a small medical school and a traditional four year institution, the decision to utilize action research was deemed the best methodology by one of the researchers to address the problem depicted and understand the continuous sequence of underdeveloped self-advocacy skills. Essential to the cycle of action research and critical to the development of the Keys to Self-Advocacy Training materials, disability services directors for each of the institutions participating in the study were allowed to preview the training and videos prior to launching them to their students, at which time they had given suggestions for improvement to shorten the training time that led to students being able to choose only one part of the training to partake in, as well as the use of more empowering language such as learning difference instead of learning disability. Two students, not enrolled at any of the three institutions, but meeting the participant criteria, also previewed the training materials to offer feedback. These pilot participants mentioned in their feedback that the training was easy to follow and understandable; however, the length of the training may deter participation. The chosen platform for the current study was virtual because it was important to the researcher and disability services directors that the students remain anonymous as well as being afforded the opportunity to have a comfortable, unrestricted space of their choosing to participate in the training. Modules were created to expand on each of the three components of self-advocacy, stemming from M. E. Skinner's (1998) definition of self-advocacy. Skinner posited students achieve self-advocacy when they: "(a) demonstrate an understanding of

their disability, (b) are aware of their legal rights, and, (c) demonstrate competence in communicating rights and needs to those in a position of authority” (p. 278). Utilizing a curriculum and the post-quiz questions modified from the in-person Self-Advocacy and Conflict Resolution Training conducted by Palmer and Roessler (2000), the researchers created the three modules listed below.

- **Module 1: Understanding your Learning Difference** focused on knowing oneself and helping the student become familiar or more familiar with the needs or accommodations associated with the learning difference, thus conveying the importance of understanding the impact it may have on the individual in the classroom while interacting with other students socially.
- **Module 2: Disability Rights in Higher Education** discussed the responsibilities of the student, faculty, and institution in the accommodation process and gave an example of a standard grievance procedure if a student has been discriminated against or excluded from a program because of the presence of a disability, as well as Section 504 of the Rehabilitation Act and the Americans with Disabilities Act.
- **Module 3: Communicating Needs for Accommodations** included role-play where the script covered target behaviors outlined in Palmer & Roessler’s (2000) Self-Advocacy and Conflict Resolution training. Target behaviors include the introduction, disclosure of the disability, solution statements, agreement, conversation recap, and negotiating the appropriate accommodations.

With this being a virtual training, finding the proper platform to create the training videos was an important component of the development process. PowToon, a web-based platform to build animated presentations, was used to generate the Keys to Self-Advocacy Training videos and add voice-over narration as well as closed captioning to enhance accessibility. Having the disability services directors serve as liaisons, students received emails through their student email accounts inviting and reminding them to participate in the training and complete the survey during their first semester of college.

With the goal of offering succinct, student-oriented training, the participation time totaled 15 minutes and included a pre-survey, three five-minute training videos of participant’s choosing, and a post-survey. At the end of the survey students were given the oppor-

tunity to enter a drawing for a \$50 Amazon gift card. To protect anonymity, students were not prompted to enter any identifiable information such as name or student identification number when completing the training and surveys.

Evaluation of Observed Outcomes

The number of participants for each module reflects each student’s individual selection when asked which topic they would like to learn more about; 50% (3) of students chose **Module 1: Knowledge of Self-Understanding your Learning Difference**, 16% (1) selected **Module 2: Knowledge of Rights-Disability Rights in Higher Education**, and 33% (2) **Module 3: Ability to Communicate-Effective Accommodation Conversation**. For all pre- and post-training survey items, a five-point Likert scale was utilized, from Strongly Agree (weighted as 5) to Strongly Disagree (weighted as 1). The purpose of this study was to determine the ability of freshmen students with a documented learning difference to acquire knowledge of self-advocacy through a virtual training; with only six participants the researcher was unable to truly assess the significance. Most of Modules 1 and 3 statements both yielded a pre-training response Mean above 4.0 meaning that responses before viewing the training video were strongly or somewhat agree showing confidence of the participants in the understanding of their learning difference and effective communication skills prior to encountering the training. All responses for the post-training survey statements were rated more highly than pre-survey statements, with the exception of a statement in Module 3; however, the positive change (Δ) demonstrates that the training provides some ability to educate the participant based on their preliminary understanding of their learning difference, educational rights, and communication skills. In Module 1, all students indicated they strongly agreed ($M=5.00$) they were aware of how their learning difference can affect them in an academic setting in the post-survey. The students’ responses changed most on knowing the name of their learning difference. Although the data for Module 2 is only based on one person, a positive change was reported in the post-survey. Module 3 post-survey responses also showed a positive change reported in all statements except the statement “I can determine if the accommodation arrangements are acceptable”. The act of self-advocating for college students allows the student to access useful and reasonable accommodations both in the academic setting and in their chosen career, possibly closing the gaps in employment and completion rates.

Training Feedback

After the Keys to Self-Advocacy training, students were asked to provide feedback; 80% of the students “somewhat agreed” that the information provided in the training was useful. Within those six participants, 60% of the participants indicated that they had never participated in a self-advocacy training, and that same percentage stated that the format of the training was easy to follow. One of the key objectives of this training was to empower students to become better self-advocates by providing them with information concerning common effects and accommodations for their learning difference, educational rights, and communication skills to be utilized in future situations. After completing the training, 80% of students “somewhat agreed” that the information in the video would help them in future situations concerning their learning difference and accommodations.

Implications and Portability

One of the limitations resulting in six participants involved the researcher being unable to have direct contact with the participants, and the initial thought process was to have the students receive the email from someone they were familiar with, such as the disability service director. The goal of this approach was to increase participation drawing from the relationship established between the student and the disability services director on campus. The results, while representing a minimal participant pool, do show promise for the Keys to Self-Advocacy training if it continues to be molded to meet the needs of students with disabilities. Moving forward, the training and content of its modules will continue to be evaluated by the researcher allowing students under the umbrella of disability services to participate to receive training on all three parts of self-advocacy through a virtual platform. The researcher recommended that other institutions implement the training in a controlled computer-based environment through a learning management system that can track student progress and consistently send reminders until the training is completed. With little resources, a disability services office in collaboration with other units on campus could implement this training in a virtual manner, gearing it towards new students registered with the office of disability services. Using the training in a more generalized approach could also help close gaps in self-disclosure, by providing it to all students with or without a disability, helping raise awareness of the disability services office and its available resources. Should a disability services office choose to provide this training to all students regardless of their diagno-

sis, the module content can be modified by including a list of all common accommodations for an array of disabilities, how those disabilities can affect a student in a campus environment, and adding more scenarios where students may have to communicate their need for accommodations to residence hall directors or other faculty. For future research, a comparative analysis of self-advocacy training could be conducted to assess the best method for training facilitation, face-to-face or virtual method. Another research endeavor could be a longitudinal survey created to evaluate the student’s self-advocacy capability through their college journey into employment, after participating in the Keys to Self-Advocacy training in their first year of college and receiving updated training upon degree completion with transition modules to address the process for obtaining accommodations for entrance exams for graduate school such as the GRE, LSAT, and MCAT as well as how to self-disclose for the purpose of workplace accommodations.

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Morgan Russell received her B.S. degree in Psychology from South Carolina State University, M.S. in Higher Education from Walden University, and Ed.D. in Higher Education Leadership from Maryville University. Her experience includes serving as a Director of Disability, Testing, and Compliance at Hampton University and Student Disability Services Coordinator at Eastern Virginia Medical School, outside of disability services she has held other Student Affairs positions focusing on student success and academic advisement. She is currently the Associate Director of Disability Services and Multicultural Affairs at the University of Richmond and enjoys helping students navigate their college experience. She can be reached by email at: mrussell@richmond.edu.

Denise Pearl received her B.S. degree in mathematics/secondary education from Bradley University, her M.A. in human development counseling with an emphasis in school counseling also from Bradley University, and Ph.D. in higher education administration with an emphasis in student affairs from Saint Louis University. Her experience includes working for over 25 years in higher education in various capacities within Student and Academic Affairs. She enjoys mentoring students and is currently an instructor at Maryville University. She can be reached by email at: dpearl@maryville.edu.

Table 1*Summary of the Keys to Self-Advocacy Training Pre and Post Survey Responses*

	Pre <i>M</i>	Post <i>M</i>	<i>d</i>
Module 1			
I can identify my learning difference in functional terms (i.e., specifically how your disability affects what you do).	4.33	4.67	0.34
I am aware of how my learning difference affects me in a social setting.	4.00	4.33	0.33
I am aware of how my learning difference an affect me in an academic setting.	4.67	5.00	0.33
I know the needs I have in association with my learning difference.	4.33	4.67	0.34
I am aware of the name of my learning difference (i.e., the name of the disability in which I have been diagnosed).	3.33	4.00	0.67
Overall	4.13	4.53	0.40
Module 2			
I am aware that my instructors are obligated by law to provide me with reasonable accommodations.	2.00	3.00	1.00
After receiving my approved accommodation plan with Disability Support Services, I realize the need to meet with my instructors to discuss my accommodations.	2.00	3.00	1.00
I am aware of the process to file a formal grievance on campus if I am denied accommodations.	2.00	3.00	1.00
I am aware of the Americans with Disabilities Act (ADA).	2.00	3.00	1.00
I am aware of Section 504 of the Rehabilitation Act.	2.00	3.00	1.00
Overall	2.00	3.00	1.00
Module 3			
I can present the benefits of accommodations I have used in the past.	4.50	5.00	0.50
I can request a specific accommodation from my instructor.	4.00	5.00	1.00
I can outline each party's responsibilities for implementing my accommodations.	3.00	4.00	1.00
I can determine if the accommodation arrangements are acceptable.	4.50	4.50	0.00
I can discuss issues if accommodations are not being provided.	4.50	5.00	0.50
Overall	4.10	4.70	0.60

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- 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.
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- **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).
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- 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.
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