

Association on  
Higher Education  
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# Journal of Postsecondary Education and Disability

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# Journal of Postsecondary Education and Disability

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# Effect of PEERS® Class on Conversational Skills of Adults with Autism in College

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## Abstract

Using a single-case multiple baseline (MBL) across behaviors design, the purpose of this study was to investigate the effects of the PEERS® for Young Adults manualized intervention on the acquisition of introductory conversational skills by five adults on the autism spectrum. Five participants attended the PEERS® group in a classroom at a rural state university campus. Visual analysis of level and trend as well as Non-overlap of All Pairs (NAP) and TAU-U measures of effect demonstrated that the PEERS® intervention were indicative of a strong effect on the participants' acquisition of conversational behaviors and general knowledge related to starting, entering, and exiting conversations. Implications for practitioners, higher education faculty, and adult service providers are discussed.

*Keywords: autism, social skills, behavioral skills training, postsecondary, PEERS®*

Individuals on the autism spectrum are a heterogeneous group with diverse strengths and abilities. As a group, many of those on the autism spectrum prefer to be described as neurodivergent or “on the spectrum” as they understand autism as an inherent part of an individual’s identity (Botha et al., 2020). Many experience challenges in developing friendship making skills such as finding common interests, having conversations, and handling disagreements. In fact, these social skills challenges are a defining feature of an autism spectrum disorder (ASD) diagnosis (American Psychiatric Association, 2013). Furthermore, deficits in friendship making skills are associated with academic underachievement, unemployment, and limited independence (Brady et al., 2020). Although research has identified resources for teaching social skills to school age students with ASD (Babb et al., 2020; McMahon et al., 2013; Wong et al., 2015) only the Program for the Education and Enrichment of Relational Skills (PEERS®) for Young Adults curriculum has been validated for use with individuals over the age of 18-years on the autism spectrum diagnosis (Gantman et al., 2012; Laugeson et

al., 2017; Laugeson et al., 2014). The impact of social skills deficits can thwart success in postsecondary education, friendships, and employment outcomes for individuals with ASD (no associated intellectual disability). College students on the autism spectrum also have higher levels of stress and social anxiety (Hiller et al., 2018). Only 14% of young adults in a nationally representative sample who had received special education services through the ASD category had paid employment at the time of interview (Roux et al., 2014; Schall et al., 2020), compared to 54% of young adults in the general population at a comparable time (Taylor et al., 2012).

Communication skills have been shown to be a predictor of postsecondary success for students on the autism spectrum (Wei et al., 2016). Social skills groups are frequently used in the K-12 setting as an evidence-based practice to teach interpersonal skills to individuals on the autism spectrum and have been validated as a research-based intervention for individuals with ASD age six to 21 years. However, interpersonal skills groups are not frequently offered as a postsecondary disability related service (Elias &

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White, 2018; Reichow et al., 2013). Investigations of how best to structure interpersonal skills support on college campuses are needed (Accardo et al., 2019).

### **Social Functioning and Adults with ASD**

Young adults on the autism spectrum in college report needing support in the following: social skills, executive functioning skills, time management, managing unexpected change, and social skills compared to typical college students (Accardo et al., 2019; Alverson et al., 2015). Adults on the autism spectrum report that they experience challenges with anxiety, depression, communication with faculty and peers, organizational skills and time management (Accardo et al., 2019). While university accessibility support services offices may be adept at providing support to students with learning disabilities and sensory impairments, they are often ill equipped to provide the specific supports needed by students on the autism spectrum to assist them in the social communication challenges that define their disability (Brown, 2018).

Limited research exists on specific behavioral skill training (BST) of social skills in postsecondary settings for conversational skills, job interviews and responding to feedback from a supervisor for adults with ASD and intellectual disability (Grob et al., 2019; Roberts et al., 2020; Ryan et al., 2019; Whittenburg et al., 2020). There also exists a paucity of research on developing friendships for college students on the autism spectrum. Although social skills groups are frequently used in K-12 settings, and are recognized as evidence-based practices for individuals with ASD aged six to 21-years old, they are not commonly reported in postsecondary settings as a typical disability related service (Elias & White, 2018; Reichow et al., 2013; Wong et al., 2019). Lack of social competence and ineffective social skills have been barriers to postsecondary education completion, loneliness and depression for adults on the autism spectrum (Tobin et al., 2014; Koegel et al., 2014). Social skills groups utilizing BST are evidence-based interventions that may help to mitigate these challenges, and set young adults up for greater success in their chosen vocation and/ or postsecondary education (Ellingsen et al., 2017). The largest difference between the above cited studies and the current study is that the prior studies did not utilize an established and validated curriculum, and the current study does.

To date, only the PEERS® social skills curriculum has been validated as evidence based for young adults with ASD who are over 18-years-old (Laugeson et al., 2015; McVey et al., 2017; Reichow et al., 2013; Wyman & Claro, 2019). The PEERS® for Young Adults curriculum, developed at UCLA, has

been validated by more than a dozen research studies, across three continents (Laugeson, 2017; Laugeson et al., 2015; McVey et al., 2016; Wyman & Claro, 2019). Table 1 illustrates how BST is embedded within this manualized program.

### **PEERS® for Young Adults**

PEERS® for Young Adults manualized curricula have been validated for use with participants ages 17-35-years-old (Laugeson, 2017; Laugeson et al., 2015). The interpersonal skills taught in the manualized PEERS® intervention include skills that are foundational in establishing and maintaining healthy relationships, such as starting and maintaining conversations. Young adult PEERS® participants attend didactic lessons with role plays, behavioral rehearsals, and performance feedback. Simultaneously, participants' chosen social coaches (sibling, friend, parent or case worker) attend concurrent social coaching sessions that teach social coaches both the skills and strategies to promote generalization (Laugeson, 2017). Each conversational skill taught consists of a series of steps that participants demonstrate via role plays following explicit skills instruction as part of the social skills groups. See Table 2 for task analysis and operational definition of the steps of each skill.

To date, scant research on the effectiveness of PEERS® for Young Adults has been conducted in a seminar-style university class setting (Authors, in press). Research investigating PEERS® for Young Adults has demonstrated it as ecologically valid, developmentally appropriate, and generalizable instruction in interpersonal skills; PEERS® for Young Adults manualized curricula have been validated for use with participants ages 17-35 years old (Laugeson et al., 2015). However, most research has been conducted by clinical psychologists and psychiatrists in outpatient settings. To date, no research on the effectiveness of PEERS® has been conducted in a seminar-style university setting without social coaching. The typical inclusion criteria for previous investigations of PEERS® for young adults included: young adult was between 18 and 24 years of age; had a previous diagnosis of ASD from a licensed health or medical professional; had social challenges as reported by the caregiver; was willing and motivated to participate in the treatment; was fluent in English; had a social coach who was fluent in English and willing to participate in the study; had a composite IQ score of 70 or greater. None of the inclusion criteria indicate a requirement that the participant be attending a post-secondary institution. In addition, although pre/posttest variables have been measured, no research has measured the actual behavioral skill acquisition

**Table 1***Comparison of BST Steps and PEERS® Procedure*

BST Step	PEERS® Procedure
Instruction	Didactic Instruction
Modeling	Video Modeling
Rehearsal	Behavioral Rehearsal & HW Activities
Feedback	HW review and social coaching

of participants. The classes in the PEERS® curriculum manual that target conversational skills include a similar theme: starting/ initiating conversations, entering group conversations, and exiting conversations (Laugeson, 2017). Furthermore, there has been little research on the effect of PEERS® on demonstration of observable conversational behaviors (White et al., 2015). The current study, described below, adds to the literature by addressing these identified research gaps.

The purpose of this study was to investigate the effects of the manualized PEERS® curriculum on the acquisition of introductory conversational behavior skills by five adults with ASD who are college students. The research questions investigated were (a) What are the effects of the manualized PEERS® for Young Adults curriculum on the conversational skills demonstrated during in class role plays by young adults with ASD who attend college? (b) What are the effects of participation in manualized PEERS® for Young Adults curriculum-based class on participants' general knowledge of conversational skills?

### Methods

A multiple baseline across behaviors (MBL) design was used to examine the effects of the social skills group on the acquisition of introductory conversational behavior skills. With MBL research design, effects are demonstrated by introducing the intervention to different conversational behavior skills in a staggered fashion and then comparing the results to baseline data on those skills. In these designs, repetition across multiple AB data series are compared with the staggered introduction of the intervention across time. Thus, in MBL, baseline begins at the same time for all participants, and the intervention phase occurs in a staggered fashion. Each time the intervention is introduced, a comparison is made between behaviors demonstrated during intervention and those demon-

strated during baseline. The minimum number of phase repetitions according to Horner et al. (2005) is three. In single case design research such as MBL across behaviors, the independent variable is systematically manipulated with the researcher determining when and how the conditions change (Kratchowill et al., 2010). Thus, when behaviors change only during intervention, and not during baseline without treatment, a functional relationship is demonstrated (Kazdin, 2011). The second research question was investigated using a comparison of means between pretest and posttest.

### Participants

Participants were recruited via email fliers sent to contacts from the student accessibility services office of a large, rural, northeastern university, the autism Society of a northeastern state, and the database of a university affiliated autism research institute. A 20-minute participant screening interview was conducted with participants and their social coach (who may have been a parent, sibling or peer) by the first author in order to determine if the participants met the inclusion criteria for this study including (a) were 18-years-old or older and attend at least one college class, (b) self-reported as having problems making friends, (c) educational records/ previous IEPs reflect a receptive and expressive language score that was within average range (standard score >75), (d) had a diagnosis of ASD yet had no significant intellectual disability in their medical records, and (e) self-reported to have no severe mental health or behavioral problems (i.e. schizophrenia, bipolar disorder).

Six participants met the inclusion criteria. The results are reported for the group of five as one withdrew from the study when they moved out of state. One participant (aged 19-years) identified their gender as non-binary, three identified as male (aged 18, 19 and 22-years), and one female (aged 19-years) par-

participated in a 16-week PEERS® class provided at the college. All participants were Caucasian and in their first or second year of undergraduate studies. All participants' primary diagnosis was ASD. Social coaches (i.e. family members, guardians or case workers) participated in a separate, but concurrent social coaching classes as outlined in the PEERS® for Young Adults manualized curriculum (Laugeson, 2017). Written consent was obtained from the parents/guardians of the participants, and assent was obtained from all participants during Step-Up orientation.

### **Setting**

The setting for this investigation were classrooms in the student union of a rural public university. All participants were attending a 4-year college, and the PEERS® classes were run similar to an evening class rather than the medical mental health outpatient clinical setting used in previous PEERS® for Young Adults research (Laugeson et al., 2015). Each room contained the following: tables and chairs arranged around a central table, a dry erase board and a place to hang participants' coats. The rooms were also commonly used for university student run clubs and social gatherings.

### **Instructors**

Instructors included an assistant professor of special education, two graduate social work students, and three undergraduate students majoring in social service-related fields: human development, psychology, and sociology). The assistant professor had more than 20-years of experience teaching individuals with ASD ages 3 to 29-years, and had been certified by the UCLA Semel Institute to deliver the PEERS® for Young Adults (Laugeson, 2017) intervention. The graduate and undergraduate students received approximately 18-hours of training in how to deliver the PEERS® intervention. One graduate student facilitated the young adult intervention classes with support from the undergraduate students. The assistant professor conducted the social coaching intervention classes with support from the other graduate students.

### **PEERS® Classes**

Although the entire 16-week PEERS® for Young Adults curriculum was implemented as outlined in the manual (Laugeson, 2017), behavioral skills data were only collected for the first four classes due to the limited availability of graduate and undergraduate student data collectors. Thus, data were collected on behaviors observed during the participant role-play portion of each class on the first four lessons from the PEERS® for Young Adults curriculum (i.e., trading information,

starting, entering, and exiting conversations). These skills were chosen as they are the foundational skills for future friendship development (Laugeson et al., 2015). The first part of each lesson involved a 30-minute review of homework activities practiced from the previous class (i.e., making a phone call, trading information, and finding a common interest with a peer). The next 20-30 minutes involved instruction in the steps for each skill, including video models, followed by 20-30 minutes of behavioral role play rehearsal by participants with feedback from the instructors. The instructors followed the PEERS® for Young Adults manual to ensure fidelity (Laugeson, 2017).

Each conversational skill taught consisted of a series of steps that participants demonstrated via role plays following explicit skills instruction as part of the social skills groups. See Table 2 for task analysis and operational definition of the steps of each skill. The instructor listed each step and asked the participants to respond to the perspective taking questions such as: "Why would it be important to 'Watch from a distance'?" This was repeated for each step. Then, the instructors would role play nonexamples and examples via role plays for the participants to observe. After each role play, the following perspective taking questions were asked: "Do you think that person would want to continue to talk to me?", "Why or Why not?", and finally, "Which steps did we include or leave out?", (Laugeson, 2017). Following the explicit instruction, the instructors facilitated the behavioral role plays of the participants while delivering verbal feedback, and gestural, or physical prompts to help participants complete the steps. Behavioral mastery data were collected on participants' demonstration of the skills during in-class role-plays. Although role plays were intended to last the last 30 minutes of class, during many of the classes, participants asked for more time to practice and these role plays often lasted 45-60 minutes.

One lesson was utilized to teach each one of the three conversational skills. Skills consisted of a series of concrete steps that were derived from didactic and Socratic instruction, using inappropriate and appropriate role play demonstrations as teaching tools. For example, after viewing a role play demonstration, the instructor might elicit group feedback on what steps were followed, what the interaction was like for the other person, and why behaviors could be important/problematic in an interaction. The final portion of the session consisted of behavioral rehearsal skills practice, in which the group leaders created structured opportunities for the participants to practice the skill targeted in that lesson (e.g., starting conversations).



A 90-minute social coaching class ran concurrently with the young adult class, but in a separate room. The first author served as the instructor for the social coaching part of the PEERS® manualized curriculum. Social coaches were chosen by the young adults to coach them on the skills learned during PEERS® in their everyday lives outside of class. They included the parent (all mothers) of five participants, and the sister of the fifth participant. They were taught how to assist the young adult in making and keeping friends and how to provide ongoing feedback to the young adult as they completed weekly homework assignments to practice the skills and generalize the skills to different settings (Laugeson, 2017). Homework assignments included (a) in group phone or video call, (b) practice starting and maintaining a conversation with their social coach, (c) finding a club or social group to join that was associated with their interests, and entering group conversations in that group, (d) entering and exiting group conversations in their social group. No data were collected during the social coaching class for this study. However, social coaches did provide feedback to participants during participant completion of homework assignments, as outlined in the PEERS® manual (Laugeson, 2017).

## Dependent Variables

### Behavioral Skills Data

The behavioral mastery of each of the participants was measured via observational data collection using 15-minute observation session intervals during participant role-play scenarios. During the role play portion of each PEERS® for Young Adults session, participants broke up into groups of two to practice the skills learned in each session. At the end of each instructional session, instructors cued the role play was about to begin by saying something similar to: *So, these are the steps for (INSERT starting, entering or exiting) conversations with people. You are going to be practicing this as you trade information and you will continue practicing during your homework assignments with your social coach* (Laugeson, 2017). Observational data collection occurred during these role plays; the last 30 minutes of each session. Figure 1 shows an example behavioral data collection sheet used to assess both the percentage of steps of each skill mastered by each participant, and the level of prompting needed. A score of five indicated that the participant completed the behavioral step 100% independently. Least to most prompting was used for providing feedback during role-plays. A score of four indicated that a verbal prompt was given (i.e., “Remember to...”); a score of three indicated that a gestural model was provided (i.e., pointing to the

skill steps written on the board); a score of two indicates that a physical (i.e., hand over hand) prompt was provided to complete the conversational skill step. None of the participants required hand over hand prompting. Specifically, the steps for starting individual conversations involved: a) casually look over, b) use a prop, c) find a common interest (e.g., observed by the student pausing before successfully completing the next step), d) mention the common interest, e) trade verbal information about the common interest, f) assess the interest of the conversational partner (e.g., look at participants' faces), and g) introduce yourself. Thus, a total score of 5 points for each of these steps was possible, with a possible total score of 35 points for the seven steps of starting individual conversation. Steps involved for entering conversations were: a) listen to the conversation (e.g., leans ear towards the conversation), b) watch from a distance (e.g., look at those involved briefly), c) use a prop, d) identify the topic (e.g., “Hey, are you guys talking about \_\_\_?”), e) find the common interest (e.g., says something similar to “I also like \_\_\_.”), f) move closer, g) wait for a pause, h) mention the topic (e.g., “My favorite \_\_\_ is \_\_\_.”), i) assess the interest (e.g., look at participants' faces), j) introduce yourself (50 points possible). The final skill taught, exiting conversations, involved the following steps: a) keep your cool (e.g., maintain calm composure and smiles), b) look away, c) turn away, and d) walk away (20 points possible). Thus, for each skill demonstrated, a percentage of the total possible points served as the quantitative measure of mastery. Participants' general knowledge of social skills was measured at pre and posttest using the measures described below. After each class, participants were instructed to complete a related homework assignment (i.e., generalization practice) that was supported by social coaching before and after completion of the task.

The behavioral observation data collection forms were scored by circling Yes or No for each of the steps in the task analysis of the conversational skill being taught, and then circling the level of prompting required if the step was performed by the participant. If the No was circled, the participant did not receive any points for that step. If Yes was circled, the participant received one point, and then an additional sliding scale of points depending on the level of prompting required: four points for independent performance, three points if verbal promoting was required, two points if gestural/modeling was required, and one point if physical prompting was required. Thus, a score of 5-points could only be obtained if the participant completed the step independently. This scoring considers that 100% behavioral accuracy would be 100% independent.

During each session, the total points received by a participant was divided by the total points possible to obtain a percentage. Figure 1 shows an example of the behavioral observation form used to document the proficiency of each participant's role play. During the first week of the 4-weeks of the PEERS® class, participants were introduced to the format of PEERS, the instructors, and each other. Group rules were established and participants generated a list of the characteristics of good friends. At the end of the first class, participants were provided with starter questions for the role-play portion of class. Thus, during this first week of class, baseline data were gathered on starting conversations, entering conversations, and exiting conversations.

### ***Test of Young Adult Social Skills Knowledge (TYASSK)***

General knowledge of conversational skills was measured by the TYASSK (Gantman et al., 2012), a 23-item criterion-referenced measure based on the Test of Adolescent Social Skills Knowledge (TASSK; Laugeson et al. 2009) used to assess young adults' knowledge about the specific social skills taught during the intervention. It is a criterion referenced assessment of the skills taught within the PEERS® curriculum (Laugeson et al., 2009; Laugeson et al., 2012; Laugeson, 2017). The TYASSK is a criterion-referenced measure based on the PEERS® curriculum. An increase is indicated by the number of questions out of 30 that the participant answered correctly based on the content of the PEERS® curriculum. It is a way of measuring content understanding. The closer the mean percent correct is to 100%, the greater the understanding of the PEERS® content. It was administered to the young adult participants at pre- and post-intervention sessions (Gantman et al., 2012).

### **Design**

MBL across behaviors design was used to evaluate the effect of instruction in the PEERS® for Young Adults curriculum on the conversational behavioral skills acquisition of young adults with ASD. Baseline, intervention and maintenance data were collected in a staggered fashion during the behavioral practice parts of some of the classes, as outlined in Table 2. In each of the classes, 15-minute sessions probes for each skill were obtained and evaluated during participant role-plays leading to a total of 21 data points.

### **Baseline**

During the first week of the 16-weeks of the PEERS® class, participants were introduced to the format of PEERS®. Lesson one from the manualized program (Laugeson & Frankel, 2011) was conducted.

According to the manualized program, this class focused on the importance of identifying one's interests and hobbies. It also focused on the group rules and characteristics of friendship. At the end of the first class, participants were provided with starter questions for the role-play portion of class. Thus, during this first class, baseline data were gathered on starting conversations, entering conversations, and exiting conversations. Data were collected on the conversational behaviors demonstrated by each participant during each class session's role play activities. Percentage of steps performed, and level of prompting required were noted on behavioral observation data collection forms (see Figure 1 for an example) created specifically for this study based on the steps of each PEERS® skill.

Data were collected on participants' behaviors that demonstrated the skill steps for starting, entering and exiting conversations. See Figure 1 for an example of the operational definitions of behaviors observed. During baseline data collection, a researcher observed the role-plays that followed the didactic skills instruction of each lesson. Data were collected on the steps of each interpersonal skill that were completed by each participant, and the level of prompting required. Figure 1 shows an example of the behavioral observation form used to document the proficiency of each participant's role play. During instruction, participants were encouraged to use think-aloud in their role-plays such as asking out loud "What is the topic? Oh, it's..." so that these processes could be observed by instructors, and data collected on them. Participants were instructed in the lesson not to start or join conversations on topics that they do not have knowledge of. Thus, for finding a common interest, participants were scored as demonstrating the skill if they were able to meaningfully engage in a back-and-forth conversation on the conversational topic. For identifying the topic, they were scored as demonstrating the skill if their comment on "Mention the Topic" was relevant and contingent.

Baseline data for starting, entering and exiting conversations were collected during class one three using 15-minute observation session intervals during participant role-play scenarios of the initial class on how to trade information. During class two (topic: starting conversations), baseline data for entering and exiting conversations continued to be collected using four 15-minute observation session intervals during participant role-play scenarios. During class three (topic: entering conversations), baseline data for exiting conversations continued to be collected; using four 15-minute observation session intervals during participant role-play scenarios.

Figure 1

## Example Behavioral Observation Data Collection for Entering Conversations

Steps	Level of Prompting					Total Points
<b>Listen to the conversation:</b> While not speaking, listen to what the people are talking about (Participants were observed briefly looking at the person then looking back at their “prop”).	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Watch from a distance:</b> Participants were observed standing more than an arm’s length away and briefly looking at the person then back at your prop once or twice only.	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Use a prop:</b> Participants were observed looking at their phone, a book or another item while they were thinking of what to say	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Identify the topic:</b> While listening, think and determine what the topic of the conversation is. Participants were observed quietly verbalizing the topic.	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Find a common interest:</b> Participants were observed quietly verbalizing statements such as Ask yourself, is this something I know about? Am I interested? Can I trade verbal information about this topic?	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Move Closer:</b> Participants were observed moving so that they were within an arm’s length of the people talking (do not measure by holding out your arm).	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Wait for a pause:</b> If participants were observed interrupting, this was scored as not happening. Participants only spoke when others stopped speaking for a moment.	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Mention the topic:</b> Participants were observed making statements such as “Are you all talking about (insert topic)?	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Assess the interest:</b> Participants were observed to look to see if others are looking at them, body is facing them, and are talking to them).	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
<b>Introduce Yourself:</b> Participants were observed to tell their name.	Yes (1) No (0)	Ind. 4	Verbal 3	Model 2	Physical 1	___/5
						TOTAL ___/50

Note: Please see the *PEERS for Young Adults* manual (Laugeson, 2017) for further details and definitions of these steps. Permission to reprint PEERS® steps granted by Dr. Elizabeth Laugeson.

**Table 2***Data Collection*

	Class 1: Qualities of a good friend	Class 2: Starting Conversations	Class 3: Entering Conversations	Class 4: Exiting Conversations
Starting a Conversation	Baseline XXX	Intervention XXXX	Maintenance XXXXXXXX	Maintenance XXXXXXXX
Entering a Conversation	Baseline XXX	Baseline XXX	Intervention XXXX	Maintenance XXXXXXXX
Exiting a Conversation	Baseline XXX	Baseline XXX	Baseline XXX	Intervention XXXX

*Note.* Each X indicates a 15-minute data collection interval

**PEERS® Intervention**

The class topics (e.g., starting, entering, and exiting conversations) were taught according to the manualized program protocol without the social coaching component, as participants did not have social coaches available (Laugeson, 2017). See Figure 1 above for operational definitions of each of these skills. These skills were chosen as they are the foundational skills for future interpersonal skill development. Every conversational skill taught consisted of a series of steps that participants demonstrated via behavioral modeling that followed explicit skills instruction as part of the interpersonal skills groups. The instructor would list each step and ask the participants perspective, taking questions such as: “Why would it be important to ‘Watch from a Distance’?” for each step. Then, the instructors demonstrated via role models non-examples and examples the participants observed. After each role play, the following perspective taking questions were asked: “Do you think that person would want to continue to talk to me?”, “Why or Why not?”, and finally, “Which steps did we include or leave out?”

During PEERS® class two, four intervention probes were gathered using 15-minute observation session intervals during participant role-play scenarios. During PEERS® class three, four intervention probes were gathered on starting and entering conversations, and finally, in PEERS® class five intervention probes were gathered on exiting conversations were collected; all using 15-minute observation session intervals during participant role-play scenarios. Thus, the steps for each skill were introduced and measured in a staggered fashion. In order to evaluate the effects of participation in the PEERS® for Young Adults curriculum on the general knowledge of social skills, a pretest-posttest analysis of mean scores

occurred using the Test of Young Adult Social Skills Knowledge (TYASSK; Gantman et al., 2012).

**Maintenance**

Maintenance data were collected using the same behavioral data collection sheets that were used during baseline and intervention for starting conversations during the participant role play portion of the classes where skills for entering and exiting conversations were taught. Likewise, maintenance data for Starting and entering conversations were collected during the class where skills for exiting conversations were taught. Thus, data for all three groups of skills were collected during each role play in 15-minute intervals.

**Reliability and Fidelity**

During (100%) baseline classes, and all of the PEERS® intervention classes (100%) the undergraduate research assistants collected behavioral outcome data to determine inter-observer agreement (IOA) after first being trained to observe the skills outlined in Table 2 to 100% accuracy using the videos found on the UCLA PEERS® Program. The behavioral data collection sheets of each were compared, and IOA was determined using point by point comparison to be 95%. During all sessions (100%) a second undergraduate research assistant collected behavioral outcome data to determine inter-observer agreement (IOA). The TYASSK were scored by the first author, and then 100% of them were checked by the undergraduate and graduate student research assistants for consistency. IOA was calculated using point-by-point comparison; IOA = smaller count / larger count multiplied by 100.

To ensure fidelity, instructors followed the PEERS® manual (Laugeson et al., 2015) as a guide during each class. As instructors completed each step of the manual, they would check it off with a pencil. A graduate social work student observed the fidelity of implementation of 100% of the social coaching classes, and an undergraduate research assistant observed the fidelity of implementation in 100% of the young adult PEERS® classes. To determine inter-rater reliability for fidelity, research assistants who had been certified to implement the PEERS® served as a second observer who followed silently along in the PEERS® manual. If something from the manualized program was missed, this second observer pointed it out by saying something like “Don’t forget the section on page XX”. Thus, fidelity was compared and IOA was determined using point by point comparison to be 100%.

### Data Analysis

Visual analyses of differences in level and trend of data between baseline and intervention conditions, as well as NAP and the TAU-U index of overall effect for single case design were used to evaluate the behavioral skill acquisition results of this intervention (Parker et al., 2011; Scruggs & Mastropieri, 1998). TAU-U is a method for measuring data nonoverlap between two phases (Parker et al., 2010)

NAP is a measure of the percentage of all pairwise comparisons of data between phases that show improvement. Put simply, it is the percentage of data that have improved across phases (Parker et al., 2011). NAP is a nonparametric technique for measuring nonoverlap or “dominance” for two phases. It does not include data trends. NAP is appropriate for nearly all data types and distributions, including dichotomous data. NAP has good power efficiency—about 91-94% that of linear regression for “conforming” data, and greater than 100% for highly skewed, multimodal data. Alternatively, it can be derived from a Mann-Whitney U test. Strengths of NAP are its simplicity, its reflection of visual nonoverlap, and its statistical power. In many cases it is a better solution than tests of Mean or even Median differences across phases (Parker & Vannest, 2009).

In contrast, TAU-U follows the same “S” sampling distribution as Mann-Whitney U and Kendall’s Rank Correlation, so p-values and confidence intervals can be provided (Hollander & Wolfe, 1999; Kendall & Gibbons, 1990). It is also a nonparametric technique, with the statistical power of 91% to 95% of (OLS) linear regression when data conform to basic parametric assumptions. When data are nonconforming (as in this small sample size of five participants), then the power of TAU-U can exceed the parametric techniques to 115% (Parker et al., 2010).

### Results

Results indicated that the group of five participants improved their conversational behavioral skills (See Figure 2). As a whole, the group had an increase in the percentage of behaviors demonstrated for each of the three separate conversational skill sets: starting a conversation, entering a conversation, and exiting a conversation. The percentage of total points possible for each of the conversational skill sets was calculated using the behavioral observation data collection forms for each participant, and the percent demonstrated independently was graphed. As a group, participants demonstrated a marked and immediate improvement in their behavioral mastery of the steps of starting a conversation during the first class of intervention.

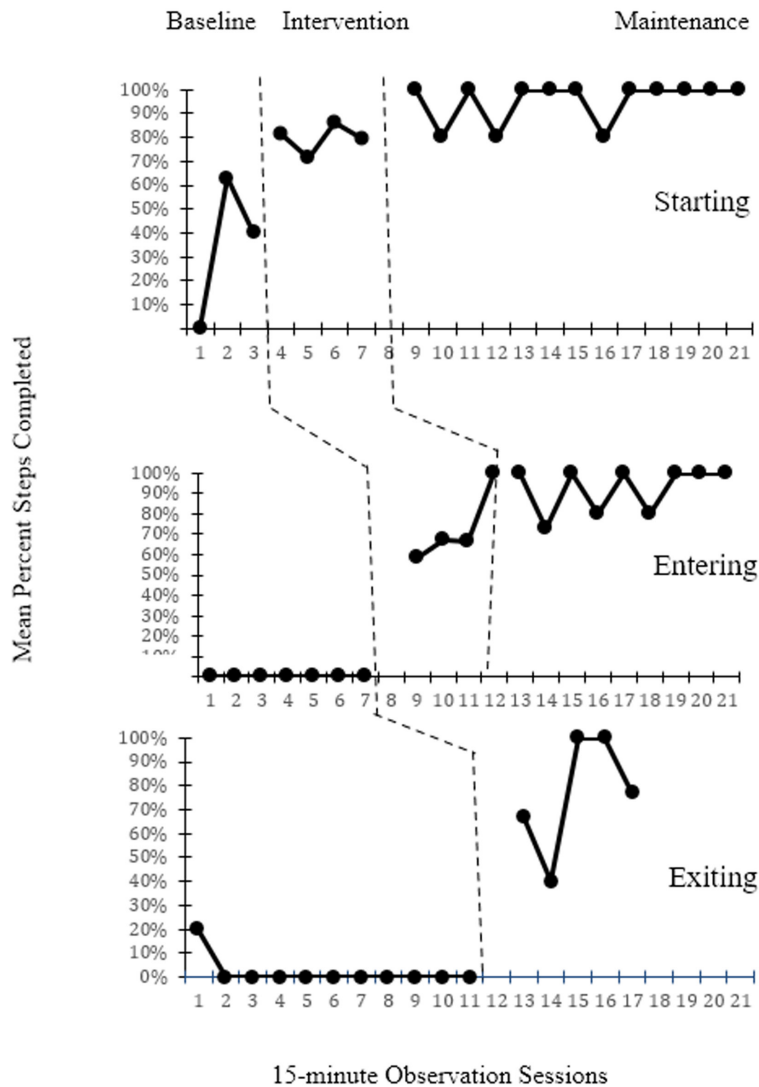
The research questions investigated were (a) What are the effects of the manualized PEERS® for Young Adults curriculum on the conversational skills demonstrated during in class role plays by young adults with ASD who attend college? (b) What are the effects of participation in manualized PEERS® for Young Adults curriculum-based class on participants’ general knowledge of conversational skills?

**Starting Conversations.** Overall, participants’ improved their performance of the skills for starting a conversation. After an initially variable baseline level and trend ( $M=21\%$ ; range = 0% to 63%), the starting conversations part of the PEERS® intervention was implemented due to the need to adhere to the manualized curriculum with fidelity. Once instruction on the steps to start a conversation began, the group increased their ability to demonstrate the behavioral skills needed for starting a conversation immediately and markedly after the introduction of the PEERS® intervention ( $M=80\%$ ; range = 71% to 86%). The data level was higher than baseline, more stable, with no overlap. The group mean level during the 13 maintenance sessions was variable, yet still markedly higher than baseline ( $M= 95\%$ ; range 80%-100%).

**Entering Conversations.** Overall, participants’ improved their performance for entering a conversation. After a very stable and low-level during baseline;  $M= 0\%$  of steps completed independently during the seven baseline observation sessions. Instruction on the steps to enter a conversation began. The group increased their ability to demonstrate the behavioral skills needed for entering a conversation immediately and markedly after the introduction of the PEERS® intervention ( $M=80\%$ ; range = 58% to 67%). The level and trend were increasing yet stable, and markedly higher than baseline. The group mean level during the nine maintenance sessions was variable, yet still markedly higher ( $M= 93\%$ ; range 73%-100%).

Figure 2

## Conversational Steps Completed per Session



**Exiting Conversations.** Overall, participants' improved their performance for exiting a conversation. After a very stable and low level during the eleven baseline observation sessions ( $M=1\%$ ; range = 0% to 20%). Once instruction on the steps to exit a conversation began, the group increased their ability to demonstrate the behavioral skills needed for exiting conversations immediately and markedly after the introduction of the PEERS® intervention ( $M=77\%$ ; range = 40% to 100%). The level and trend were increasing yet variable, and markedly higher than baseline. No group maintenance data were collected as the undergraduate students who served as data collectors left for their winter break.

### Measures of Effect

Visual analyses of differences in data overlap between baseline and intervention phases, as well as the TAU-U index of overall effect for single case design were used to evaluate the results of this intervention (Parker et al., 2010; Scruggs, & Mastropieri, 1998). According to NAP and TAU-U measures of effect, there was no overlap in behavioral outcome data collected between baseline and intervention for starting conversations NAP=100%; TAU-U=0.917 ( $Z=1.94$ ,  $p=0.5^*$ ) demonstrating that a strong measure of effect for the PEERS® curriculum on the acquisition of these skills. There was also no overlap in behavioral outcome data collected between baseline and

intervention for all participants for entering conversations;  $NAP=1.0$ ;  $TAU-U=1.0$  ( $Z=2.65$ ,  $p=0.008^{**}$ ) demonstrating that a strong measure of effect for the PEERS® curriculum on the acquisition of these skills. There was also no overlap in behavioral outcome data collected between baseline and intervention for all participants for exiting conversations;  $NAP=1.0$ ;  $TAU-U=1.0$  ( $Z=3.12$ ,  $p=0.001^{**}$ ) demonstrating a strong effect of the PEERS® intervention on exiting (Parker et al., 2010; Scruggs & Mastropieri, 1998).

The second research question was: What are the effects of participation in PEERS® for Young Adults curriculum on participants' general knowledge of conversational skills? Participants' mean score on the TYASSK at pretest was 14.9 out of 30 (49%;  $SD = 3.89$ ). Average participant score on the TYASSK at posttest was 21.1 out of 30 (70%;  $SD = 6.47$ ). This increase in mean scores indicates that young adults' knowledge about the specific social skills taught during the intervention increased markedly. The increase indicated the number of questions out of 30 that the participant answered correctly based on the content of the PEERS® curriculum. It is a way of measuring content understanding. The closer the mean percent correct is to 100%, the greater the understanding of the PEERS® content.

## Discussion

The purpose of this study was to investigate the effects of PEERS® for Young Adults curriculum the conversational skills demonstrated during in class role plays by young adults on the autism spectrum who attend college, and to determine the effects of participation in a conversational skills group class using PEERS® for Young Adults curriculum on participants' general knowledge of conversational skills. Results of this study indicated that interpersonal skills training using PEERS® could be successfully used in a college setting to improve conversation skills, and that the young adults who participated were able to demonstrate an increased understanding of the social skills taught through the PEERS® manualized curriculum.

This study expands the previous research by demonstrating a functional relationship on observable conversational skill acquisition in addition to self-report measures. Namely, a key contribution of this study is that it required some level of mastery to be demonstrated by participants during instruction. The results of this study also extend previous research investigations of the PEERS® intervention by showing a functional relationship between PEERS® instruction and subsequent observable behavioral skill

acquisition, whereas previous studies focused on the self-report of knowledge of skills and informant-report of generalized social skills via questionnaire measures (Laugeson et al., 2009; Laugeson et al., 2015). Although this study examined the acquisition and demonstration of behavioral skills by participants, additional research is still warranted to investigate how these skills generalize to other contexts. In particular, results of this study lead to further questions regarding use of PEERS® as a support in the transition to college to help alleviate challenges faced by students on the autism spectrum. Group outcomes indicated a functional relationship the PEERS® intervention and behavioral skills demonstrated for starting, entering and exiting conversations.

These results provide a basis for an ASD specific support that would help early college students with ASD to develop the interpersonal skills needed to be successful in both college and career environments. Tantam (2003) suggested that the young adult years appear to be the most socially difficult period in the lives of individuals with ASD. Findings from this study have implications for the provision of accommodations and formal support for students with ASD offered by institutes of higher education. Furthermore, there exists extensive research documenting that social deficits lie at the root of many of the education, mental health, employment, and independent living challenges faced by young adults with ASD. Due to the campus environment containing all of these areas (Barnhill, 2007; Farley et al., 2009), perhaps the provision of access to the PEERS® curriculum via a separate course, student accessibility services, or campus counseling centers may be a way to provide these accommodations.

Within a higher education institution, graduate assistants, professors, or mental health practitioners could serve as facilitators, and peers could provide social coaching. Individuals with ASD experience challenges in interpersonal skills such as making and keeping friends (Sigman et al., 1999). The results of this study suggests that PEERS®, when used at the college level may help alleviate some of these challenges. Social clubs and recreational activity participation is often limited for college students with ASD college communities, which may hinder opportunities for the development of friendships and interpersonal skills (Rigles et al, 2011). Participation in PEERS® at the postsecondary level may help to bridge this opportunity deficit.

This study contributes to and extends the existing literature by using an established and validated curriculum developed to support the interpersonal skills of college-age young adults with ASD. The largest

difference between the above cited studies and this study is that this study used an established and validated curriculum with embedded BST. Using a well validated and manualized curriculum like PEERS® helps practitioners to maintain fidelity of the intervention. Programs for individuals on the autism spectrum that are implemented with higher fidelity have been associated with larger positive outcomes (Locke et al., 2015; Mandell et al, 2013).

### **Limitations**

Although these findings are promising, some limitations should be considered when interpreting these results. Single subject research is an effective method of investigating interventions in situations where larger group designs like randomized controlled trials are impractical or inhumane. However, certain limitations of the design should be noted in interpreting results. The purpose of single subject research is not to directly generalize findings to a larger population without subsequent replication. It should be pointed out that there were differences in sensitivity (or range of possible percentage values for each conversational topic) among the tiers of this multiple probe design based on the number of components listed per tier (seven for starting, ten for entering, four for exiting). The total possible points varied by tier (35 points for starting, 50 points for entering, 20 points for exiting). Authors converted the points to percentages to equate the y axis across tiers, but each scale still varies in sensitivity. This smaller range of possible values might explain the variability tiers.

Furthermore, while this study and its findings focus solely on conversational skills, the impact of PEERS® in all of the interpersonal skills demonstrated throughout the 16-week manualized program for college students with ASD is outside the scope of our study. Replication is needed across both settings and with all PEERS® skills. Related to this need for replication, it is difficult to say with certainty if these skills would generalize to other campus settings such as clubs, residence halls, or dining halls. It will be critical to investigate if the skills demonstrated in these sessions can be generalized to typical social settings in colleges. These limitations point to the need for further research in this area to further inform the initial findings presented from this study.

### **Implications for Research**

Findings of this study provide important considerations and implications for future research. First, more research is needed to investigate the actual interpersonal skills demonstrated across more settings. A study investigating the use of the PEERS®

curriculum as part of a college program for students on the autism spectrum during the semester and while campus social events occur would allow for more generalization data to be observed. Furthermore, replication of these findings with a larger, more diverse, and more rigorously characterized sample (e.g., assessment verification of ASD diagnosis, IQ) is warranted. More research is also needed to investigate if the behavioral skills acquired in the PEERS® classes generalize and are maintained in other campus communities, and job-related settings. Future research might also investigate the effects of this intervention over a longer period of time, and with more participants as an accommodation in higher education to evaluate the impact of the curriculum on participants' relationships with roommates, faculty, and career supervisors.

Previous research investigating PEERS® has focused on the mental health benefits, and associated decrease in anxiety, depression as well as increase in social get togethers (Laugeson et al., 2009; Laugeson et al., 2014; Laugeson et al., 2015). The association of participation in PEERS® with an increase in social get-togethers has been identified in previous research studies (Schohl et al., 2014); thus, future research investigating the longitudinal effects of participation in PEERS® with average number of social get-togethers throughout college, likelihood of attending college, college completion rates, and employment rates would be critical to investigation of long-term outcomes. Although previous research on the PEERS® curriculum indicates that its results are generalizable for anxiety and interpersonal knowledge, behavioral performance and behavioral accuracy data had not been collected in those studies in generalized settings. Future researchers are also encouraged to repeat roleplays until participants demonstrate 100% accuracy independently (Murphy et al., 2018).

At college level, in the absence of caregivers, future research to include peer coaches in the intervention (e.g., undergraduate or graduate students as social coaches outside of the treatment setting) instead of family members may be more socially valid. Involving parents or caregivers at the campus level as a support would not be socially appropriate, as other college age students do not take classes with their parents or caregivers. Using peer mentors would allow for authentic friendships to possibly develop based on common interests, and involvement in campus-based social clubs. It will also be important to investigate how these supports may address persistent poor retention and graduation rates.



### Implications for Practice

This study has several implications for practitioners in both postsecondary and K-12 settings. For college support service professionals, this study's findings provide insight into effective programming for college students with ASD. PEERS® should be considered as an option for extending support beyond academic services and accommodations to address critical skill areas for students with ASD such as interpersonal skills, executive functioning skills, time management, and coping with unexpected change. For K-12 transition professionals, these findings show that postsecondary education is a viable option for transition-age youth with ASD who may require additional support with social skills. However, providing a service such as PEERS®, while potentially very helpful, and perhaps something that universities should seriously consider offering to aid the success of their students with autism, is not necessarily an "accommodation". It could therefore be difficult for the typical disability services office to offer such a labor-intensive program (as many such offices are already taxed and sometimes under-staffed to be able to provide even the legally mandated accommodations for its college's students). Thus, transition teams should examine and identify institutes of higher education that may offer PEERS® groups and other specialized support services aligned with student needs and share information with youth and families to inform transition decision making related to postsecondary education. Finally, post intervention outcome interviews would be beneficial to evaluate the social validity of the intervention for all participants.

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# Executive Functioning and College Adjustment in Students With and Without Autistic Traits

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## Abstract

Although individuals with autism spectrum disorder (ASD) are attending college at higher rates, students with ASD continue to struggle with adjusting to the college environment and successfully completing their degrees. Thus, the present study compared executive functioning (EF) and academic outcomes (i.e., performance, adjustment) among students with and without ASD traits, as well as examined associations among these variables. Findings revealed greater executive dysfunction and lower levels of both social and personal-emotional adjustment among students with ASD traits. Additionally, ASD symptomatology predicted social and personal-emotional adjustment among students, above and beyond the influence of EF. Results suggest that cognitive, social, and emotional supports may all be important to improve college adjustment among individuals with ASD.

*Keywords: executive functioning, college adjustment, academic performance, ASD symptomatology*

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by challenges in social functioning and patterns of fixed interests and repetitive behaviors (American Psychiatric Association, 2013). During the past decade, research has shown that adults with ASD are attending college at growing rates (Cox et al., 2017; Van Hees et al., 2018; Volkmar et al., 2017). This increase reflects the shift to include more high functioning cases in an ASD diagnosis, better lifelong interventions, and the fact that many individuals with ASD have average to above-average intellectual abilities (Anderson et al., 2019; VanBergeijk et al., 2008). Still, the college completion rate for students with ASD is significantly lower than for students with other disabilities and neurotypical students (Newman et al., 2011; Sanford et al., 2011; Shattuck et al., 2012).

Importantly, completing college can increase the probability that young adults on the spectrum will obtain high-quality employment that can support independent living and a better quality of life (Walsh et al., 2014). Thus, there is a pressing need to identify factors that may be prohibiting students with

ASD from successfully navigating the challenges of a postsecondary education. One factor that has been increasingly theorized to impact the success of college students with ASD, but has been relatively unexplored, is executive functioning (EF; Shmulsky et al., 2017; Wallace et al., 2016). As such, the current study sought to characterize EF among college students with and without ASD traits and delineate associations between these skills and academic outcomes, including adjustment to college. Note that throughout this manuscript we chose to use person-first language because it puts the person first, although we recognize and respect that others prefer identity-first language (e.g., autistic adults).

## Executive Functioning and College Outcomes

Although there is a lack of consensus regarding the definition of EF and the skills that comprise it (Dawson, 2014; O'Donnell, 2017), EF is often described as the processes that govern higher-order cognitive abilities (Roth et al., 2005). According to Roth et al. (2005), "executive functions are a set of interrelated control processes involved in the selection, initiation,

execution, and monitoring of cognition, working memory and emotions, as well as aspects of motor and sensory functioning” (p. 1). As students transition into the college setting, EF skills play an important role in academic success as students must structure their own time and schedules, organize school materials, initiate study routines, and balance academic and non-academic activities through self-discipline (MacCann et al., 2012; Richardson et al., 2012). In fact, EF impairments in college students are not only significant predictors of academic performance (e.g., GPA), but also worse time management (e.g., procrastination, inefficient use of study time) and increased test anxiety (Kim & Seo, 2015; O’Donnell, 2017; Rabin et al., 2011). Additionally, EF skills have been linked to academic, relational, and psychosocial adjustment to college (Marshall, 2016; Sheehan & Iarocci, 2019). This is notable given that adjustment to the college environment is predictive of both academic performance and retention, as well as feelings of belonging and attachment to one’s school (Credé & Niehorster, 2012).

### **Executive Functioning and College Outcomes in Autism Spectrum Disorders**

It has been suggested that difficulties with EF may underlie ASD symptoms, although study findings have been mixed (e.g., Demetriou et al., 2018; Hill & Bird, 2006; Ozonoff et al., 1991). Nevertheless, specific challenges in the domains of cognitive and behavioral flexibility, planning, and working memory have been identified in ASD (Dijkhuis et al., 2020; Granader et al., 2014; Hill, 2004; Kenworthy et al., 2008). Results from a recent meta-analysis indicate that individuals with ASD experience broad EF challenges across the developmental continuum (Demetriou et al., 2018). That being said, past work has often relied on performance-based measures of EF (e.g., Tower of Hanoi/London, Wisconsin Card Sorting Test) that may not fully capture daily executive functioning (Toplak et al., 2013). Thus, there is a need to incorporate more “ecologically valid” measures into EF research with individuals who have ASD.

One such measure is the Behavior Rating Inventory of Executive Function-Adult Form (BRIEF-A), which assesses an individual’s degree of executive dysfunction in their everyday environment (Roth et al., 2005). Using the BRIEF-A, Wallace et al. (2016) examined the real-world EF abilities of adults with ASD without intellectual disability (18 - 40 years of age). Through informant (parent) reporting, Wallace and colleagues found that adults with ASD showed more EF dysfunction on the BRIEF-A relative to the manual’s population mean, with the most prominent

deficits occurring in flexibility and planning/organization. Though informative, additional research is needed to determine whether the same pattern of results are present when using the self-report version of the BRIEF-A with college students with and without ASD traits.

Consistent with findings in the broader college student population, Shmulsky et al. (2017) found that college students with ASD who had clinically significant executive dysfunction in terms of behavioral regulation scores on the BRIEF-A had lower end of year GPAs than students with ASD who did not have behavioral regulation difficulties. Similarly, Dijkhuis et al. (2020) examined associations between academic progress (i.e., number of higher education credits earned) and EF scores on the BRIEF-A and on lab-based performance measures of EF. Findings revealed that students with ASD who had higher self-reported EF skills, as well as better scores on working memory and cognitive flexibility performance-based tasks, made better academic progress (Dijkhuis et al., 2020). Moreover, self-reported EF skills, particularly planning and organizing abilities, were predictive of academic progress even after controlling for ASD symptom severity (Dijkhuis et al., 2020).

Although this work provides initial insight into the role of EF in the outcomes of college students with ASD, gaps remain in the literature. Firstly, most present research lacks a comparison group of neurotypical students without ASD, making it unclear whether the pattern of associations between EF and academic performance is similar for college students with and without ASD symptomatology. Secondly, past work has often focused solely on the relation between EF and academic performance, ignoring other areas of functioning that affect success in college (e.g., social and emotional adjustment). Notably, Trevisan and Birmingham (2016) found that college students with ASD traits reported poorer academic and social adjustment, as well as marginally lower personal-emotional adjustment, than those without ASD traits. Given the role of adjustment in college success (Credé & Niehorster, 2012), it is important to examine whether EF difficulties may be contributing to poorer college adjustment in students with ASD. This knowledge can guide future intervention efforts in the college setting.

### **The Present Study**

With these points in mind, the present study sought to characterize and compare EF, academic performance (i.e., GPA), and adjustment to college (i.e., academic, social, personal-emotional, institutional attachment) in students with and without ASD

traits. Additionally, we investigated how GPA and adjustment varied as a function of EF as well as ASD symptomatology, and whether the pattern of associations differed between groups. We focused on both performance and adjustment given past work showing that high functioning university students with ASD are often academically successful (Gelbar et al. 2015; Jackson et al., 2018), but struggle with socio-emotional challenges associated with college (e.g., social isolation, social anxiety; Accardo, 2017; Cox et al., 2017; Gelbar et al., 2015). We were also interested in whether students with and without ASD traits differed on institutional attachment. Institutional attachment captures how much a student identifies with and is emotionally attached to their university (Credé & Niehorster, 2012), and could provide additional insight into the unique adjustment issues of college students with ASD traits.

Comparing those with and without ASD traits offered multiple advantages. Past research has often focused exclusively on the recruitment of students with a formal ASD diagnosis, particularly through their campus student accessibility offices. Such practices may exclude a number of college students with ASD symptomatology who are on campus. For example, studies have shown that students with ASD may under-identify with student accessibility offices, and that students may exhibit ASD traits without a formal diagnosis (Cox et al., 2017; Newman et al., 2011; White et al., 2011). It is also important to note that female students are more likely to be underdiagnosed than male students (Hull et al., 2020). In fact, it has been asserted that a female autism phenotype exists that current diagnostic tools do not capture (Hull et al., 2020). Finally, our sampling approach (i.e., assessing those with and without ASD traits) aligns with the spectrum nature of the condition, with traits falling along a continuum in the general population (American Psychiatric Association, 2013; Constantino & Todd, 2005). Our research aims were as follows:

First, we assessed whether college students with and without ASD traits differed across a range of EF skills. Guided by past work (e.g., Wallace et al., 2016), it was expected that EF difficulties would be particularly prominent for shifting as well as metacognitive aspects of EF in those with ASD traits, including working memory, planning, and task monitoring.

Second, we investigated whether students with and without ASD traits differed in terms of academic performance (i.e., GPA) and adjustment to college (i.e., Student Adaptation to College Questionnaire; SACQ). In line with Trevisan and Birmingham (2016), students with ASD traits were expected to show less social adjustment, and perhaps less person-

al-emotional and institutional attachment, than students without ASD traits. It was less clear whether differences would be found for academic adjustment, given conflicting findings in the literature (e.g., Jackson et al., 2018).

Third, the relations between executive dysfunction, ASD symptomatology, and academic outcomes variables (performance and adjustment) were examined. Guided in part by prior research, we expected that greater executive dysfunction and more ASD symptomatology would be related to poorer academic performance and adjustment. Additionally, we explored whether executive dysfunction or ASD symptomatology was a stronger predictor of academic outcomes.

## Method

### Participants

A total of 144 college students at a private university in a large city in the Midwest region of the U.S. completed the online study as part of a requirement for Psychology 101 classes. Students completed the study during the fall semester of 2019 (pre-pandemic). This total sample was obtained after removing two neurotypical students for passing the threshold for missing data on the BRIEF-A and one student with ASD traits for exceeding threshold on the Inconsistency score on the BRIEF-A. Per the guidelines of the BRIEF-A manual (Roth et al., 2005), if the total number of missing responses was greater than 14 out of 75 items the protocol was invalid. The Inconsistency score reflects inconsistent responding to 10 item pairs on the BRIEF-A. These item pairs are similar but have minor differences in wording (e.g., “I make careless mistakes” versus “I make careless errors when completing tasks”). As defined below, college students were categorized into two groups: students without ASD traits ( $n = 87$ ) and students with ASD traits ( $n = 57$ ). Those with ASD traits (Mean Age = 19;10, Age Range 18;04 – 25;02) and those without ASD traits (Mean Age = 19;08, Age Range 18;10 – 22;07) did not differ on chronological age,  $t(142) = 1.56, p = 0.12$ , and were predominately (67%) White (see Table 1). Participants were also predominately female (76%), which is consistent with the demographics of the school and the five classes in which students were recruited. Table 1 provides additional information on these and other demographic variables, as well as group comparisons and effect sizes.

The Social Responsiveness Scale, Second Edition (SRS-2; Constantino & Gruber, 2012) was used to determine ASD traits (see Table 1). The SRS-2 is a 65-item questionnaire used to identify the presence

**Table 1***Participant Information for College Students With and Without ASD Traits*

	Without ASD Traits	ASD Traits	$t / \chi^2$	$p$	$d/\phi$
	$M (SD) / n (%)$	$M (SD) / n (%)$			
Chronological Age (year; months)	19;08 (4;04)	19;10 (6;03)	1.56	0.12	0.27
Male:Female	11:76	15:42	2.92	0.08	0.14
Racial/Ethnic Identity					
White or Caucasian	63 (72%)	33 (58%)	9.04	0.11	0.25
Black or African American	0 (0%)	1 (2%)			
Asian or Asian American	12 (14%)	14 (25%)			
Hispanic or Latino/Latina	10 (12%)	4 (7%)			
More than one race	1 (1%)	4 (7%)			
Other	1 (1%)	1 (2%)			
Year in School			7.38	0.12	0.22
Freshman	58 (67%)	36 (63%)			
Sophomore	24 (27%)	19 (33%)			
Junior	4 (5%)	2 (4%)			
Senior	1 (1%)	0 (0%)			
GPA Range					
GPA Range			1.55	0.91	0.11
3.80-4.00	18 (21%)	11 (19%)			
3.60-3.79	20 (24%)	17 (30%)			
3.40-3.59	21 (24%)	9 (16%)			
3.00-3.39	18 (21%)	11 (19%)			
2.75-2.99	6 (7%)	7 (12%)			
2.00-2.74	4 (5%)	2 (4%)			
Hours Studying Per Week	15.08 (11.22)	18.49 (11.97)	-2.03	0.05	0.35
SRS-2 $T$ -score	50.26 (4.89)	66.08 (4.41)	-18.92	0.0001	3.22
Normal (59 or lower)	87 (100%)	0 (0%)			
Mild (60 - 65)	0 (0%)	29 (51%)			
Moderate (66 - 75)	0 (0%)	26 (46%)			
Severe (76 or higher $T$ -score)	0 (0%)	2 (3%)			

*Note.* GPA = Grade point average. SRS-2 = Social Responsiveness Scale, Second Edition. Effect sizes given by Cohen's  $d$  or  $\phi$ , as appropriate. Results for the treatment subscales and for the overall total score of the SRS-2 are reported as  $T$ -scores ( $M = 50$ ,  $SD = 10$ ), with a  $T$ -score of 60 or greater indicative of the clinically significant difficulties associated with ASD and quantifies their severity.



and severity of social impairment and restrictive interests and repetitive behavior associated with ASD (Constantino & Gruber, 2012). Individuals rate items about their behaviors during the past six months using a Likert-type scale ranging from 1 (*not true*) to 4 (*almost always true*). Past research has shown that the SRS-2 is a robust instrument for discriminating between individuals with and without ASD (e.g., Booker & Starling, 2011). Using confirmatory factor analysis, Frazier et al. (2014) showed that the SRS-2 distinguishes between the factor structure of ASD in a manner that corroborates the DSM-5 criteria domains. Additionally, Chan et al. (2017) found that scores on the SRS-2 correlated positively with scores on the social domain of the Autism Diagnostic Interview-Revised, (ADI-R; Lord et al., 1994). The SRS-2 has also been found to have good interrater reliability ( $r = 0.66 - 0.88$ ) and high internal consistency ( $\alpha \geq .90$ ) among adults. Results for the treatment subscales and for the overall total score of the SRS-2 are reported as *T*-scores, with a *T*-score of 60 or greater indicative of clinically significant difficulties in social interactions (see Table 1). Participants who scored above the threshold (*T*-score > 60; raw score > 70) were included in the ASD traits group, whereas those who scored below the clinical threshold were included in the group without ASD traits. Students with ASD traits scored significantly higher than students without ASD traits on the SRS-2,  $t(142) = -18.92, p = 0.0001$ , see Table 1.

Self-reported diagnostic history was also gathered and showed that 12% of the students from the ASD traits group reported that they had received a formal ASD diagnosis at some point in their lives. Although analyses were underpowered to detect significant differences between those with and without a previous diagnosis of ASD, their scatterplots were compared. The responses of those with a previous ASD diagnosis aligned with the distribution of the larger ASD trait sample across all measures and outliers were not detected. None of the students without ASD traits reported a previous ASD diagnosis.

## Measures

**Behavior Rating Inventory of Executive Functioning - Adult Version (BRIEF-A).** The BRIEF-A is a standardized, 75-item self-report measure that assesses adults' views of their own EF in their everyday environment (Roth et al., 2005). The measure is composed of nine distinct, theoretically derived scales that capture different aspects of EF: inhibit, shift, emotional control, self-monitor, initiate, working memory, plan/organize, task monitor, and organization of materials. These nine scales form two broad

index scores, with the first four subscales forming the *Behavioral Regulation Index (BRI)* and the last five subscales forming the *Metacognition Index (MI)*.

The BRI provides an overall measure of one's ability to maintain appropriate regulatory control of their behavior and emotional responses. The MI assesses an individual's overall ability to solve problems through planning and organization (Roth et al., 2005). Together they form an overall summary score, the *Global Executive Composite (GEC)*. All scores are presented as *T*-scores ( $M = 50, SD = 10$ ) derived from comparisons with normative data. Higher *T*-scores are indicative of more executive dysfunction, with *T*-scores of 65 or higher indicative of clinically significant impairment. The BRIEF-A has demonstrated strong evidence of reliability and validity of "executive functioning in individuals with a range of conditions across the adult age spectrum" (Roth et al., 2005, p. 1).

**Student Adaption to College Questionnaire (SACQ).** The SACQ (Baker & Siryk, 1999) is a 67-item self-report measure that assesses students' adjustment to college. On this measure, students rate items using a 9-point scale, ranging from 1 (*doesn't apply to me at all*) to 9 (*applies very closely to me*) to determine adjustment across four subscales (academic, social, personal-emotional, institutional affiliation) and the full scale. *Academic adjustment* assesses how well the student manages the academic demands of school as indicated by the adequacy of their studying and academic efforts, as well as their attitudes toward their course of study. *Social adjustment* captures the degree to which the student has integrated themselves into the social milieu of college, including meeting new people and making friends. *Personal-emotional adjustment* reflects students' psychological and physical well-being. Finally, *institutional attachment* captures how much a student identifies with and is emotionally attached to their university as well as their general desire to be in college. For each domain, as well as for the full-scale, a *T*-score is obtained with higher *T*-scores reflecting more adjustment. The SACQ was selected because it is one of the most widely used measures of college adjustment in the general college population and has been well-validated, with the four SACQ domains associated with grade point average, use of campus services, and attrition (Beyers & Goossens, 2002; Credé & Niehorster, 2012). Although the SACQ provides valuable information regarding adjustment to college and may reveal new insights about the college experience of students with ASD, few studies have administered the SACQ to college students with ASD symptomatology (Trevisan & Birmingham, 2016; White et al., 2016).

## Results

### Preliminary Analyses

Descriptive statistics were calculated for all variables of interest, including ASD traits (i.e., SRS-2), EF (i.e., nine subscale scores, behavioral regulation index [BRI] and metacognition index [MI] indices scores and the overall global executive composite [GEC] score on the BRIEF-A), and indicators of academic performance (i.e., GPA) and adjustment to college (i.e., four subscales and full-scale score on the SACQ). All data were assessed for outliers and skewness. To eliminate redundancy, all statistical test results, along with effect sizes, are provided in the tables. Effect sizes are presented for dichotomous (*Phi*) and continuous (Cohen's *d*) outcomes to aid with the interpretation of group differences. For Cohen's *d*, 0.20 denotes a small effect, 0.50 denotes a medium effect, and 0.80 denotes a large effect (Lakens, 2013). For *Phi*, 0.10 denotes a small effect, 0.30 denotes a medium effect, and 0.50 denotes a large effect (Cohen, 1988).

### Research Aim 1: EF in Students With and Without ASD Traits

Mean *T*-scores on the BRIEF-A are displayed in Table 2. Higher scores on these scales reflect more executive dysfunction. Independent samples *t*-tests with Bonferroni correction indicated that students with ASD traits exhibited more executive dysfunction than students without ASD traits on the GEC, BRI, and MI, as well as on the individual nine clinical scales comprising these scores. Table 2 provides *t*-test results and effect sizes, with self-monitor, working memory and task monitor subscales showing the largest effect sizes.

Clinically or abnormally elevated levels of executive dysfunction are determined by a *T*-score of 65 or greater, which represents 1.5 standard deviations above the population mean (Roth et al., 2005). Table 3 shows the percentage of students with and without ASD traits exceeding threshold levels of executive dysfunction on the GEC, BRI and MI indices and the nine subscales that comprise these indices, as well as group comparisons and effect sizes. As shown in Table 3, chi-square analyses indicated that students with ASD traits were more likely than students without ASD traits to exhibit elevated levels of executive dysfunction on all scales except the organization of materials subscale. The largest effect sizes were seen for the inhibit, working memory and plan/organize subscales on the BRIEF-A (see Table 3).

### Research Aim 2: Academic Performance and Adjustment in Students with and without ASD Traits

Chi-square analysis and independent-samples *t*-tests were conducted to examine whether students with and without ASD traits differed on academic (GPA) and adjustment to college variables (SACQ). Results and effect sizes are displayed in Tables 1 and 4, respectively. Students with and without ASD traits did not differ in terms of overall GPA and other academic variables, although students with ASD traits reported studying more hours (see Table 1). In terms of adjustment scores, students with ASD traits demonstrated significantly lower levels of social and personal-emotional adjustment than students without ASD traits. However, no significant differences were found in terms of academic adjustment or institutional attachment (see Table 4). In other words, students with ASD traits showed lower social and personal-emotional adjustment to college, whereas students with and without ASD traits did not differ in terms of academic adjustment or their attachment to their schools.

### Research Aim 3: Associations Between ASD Symptomatology, EF, and College Variables (GPA, Adjustment)

Table 5 displays Pearson bivariate correlations between ASD symptomatology (SRS-2 *T*-score), executive dysfunction (GEC *T*-score), academic performance (GPA), and adjustment to college (SACQ) in students with and without ASD traits. Note that in Table 5, correlations for students with ASD traits are reported in the bottom left of the matrix, whereas correlations for students without ASD traits are reported in the top right of the matrix. To reduce the number of analyses and the potential for Type 1 error, only the GEC *T*-score was used in correlation and regression analyses to capture executive dysfunction.

In students with ASD traits, higher scores on the SRS-2 were associated with more executive dysfunction. Although students *without* ASD traits did not exceed the ASD threshold on the SRS-2, higher scores within the normal range on the SRS-2 were also associated with greater executive dysfunction (see Table 5 for values). This means that higher ASD symptomatology scores were related to more executive dysfunction for both groups of students (i.e., students with and without ASD traits). In students with ASD traits, greater ASD symptomatology was associated with less social adjustment, but EF was not associated with adjustment variables. Additionally, no significant correlations were found between EF and academic performance (i.e., GPA) in students with or without ASD traits. All correlational values are provided in Table 5.

**Table 2***Executive Functioning (BRIEF-A) in College Students With and Without ASD Traits*

BRIEF-A	Without ASD Traits (M/SD)	ASD Traits (M/SD)	<i>t</i>	<i>p</i>	<i>d</i>
GEC	45.75 (8.3)	57.49 (13.1)	-6.59	<0.001	1.12
BRI	46.68 (8.7)	57.40 (13.0)	-5.93	<0.001	1.00
Inhibit	48.68 (9.1)	57.30 (11.6)	-4.98	<0.001	0.85
Shift	48.09 (8.8)	56.74 (12.8)	-4.81	<0.001	0.82
Emotional Control	48.29 (9.7)	56.61 (12.1)	-4.55	<0.01	0.78
Self-Monitor	45.52 (7.4)	53.02 (12.1)	-6.49	<0.001	1.11
MI	45.67 (8.2)	56.60 (12.0)	-6.50	<0.001	1.11
Initiate	47.95 (10.1)	57.25 (12.5)	-4.90	<0.001	0.83
Working Memory	48.00 (8.8)	60.14 (13.1)	-6.69	<0.001	1.14
Planning/Organization	46.36 (7.7)	53.39 (11.7)	-5.60	<0.001	0.95
Task Monitor	46.12 (9.6)	57.02 (12.1)	-5.99	<0.001	1.02
Organization of Materials	42.76 (8.6)	49.28 (10.4)	-4.09	<0.001	0.70

*Note.* BRIEF-A = Behavior Rating Index of Executive Functioning-Adult Version. GEC = Global Executive Composite. BRI = Behavior Regulation Index. MI = Metacognition Index.

**Table 3***Elevated Levels of Executive Dysfunction on the BRIEF-A in College Students With and Without ASD Traits*

BRIEF-A	Without ASD Traits <i>n</i> (% elevated)	ASD Traits <i>n</i> (% elevated)	$\chi^2$	<i>p</i>	<i>phi</i>
GEC	3 (4%)	18 (32%)	21.88	0.0001	0.39
BRI	5 (6%)	18 (32%)	17.12	0.0001	0.35
Inhibit	2 (4%)	17 (30%)	22.50	0.0001	0.40
Shift	2 (4%)	13 (23%)	12.11	0.0001	0.29
Emotional Control	7 (8%)	16 (28%)	10.29	0.001	0.27
Self-Monitor	2 (4%)	8 (14%)	7.34	0.007	0.23
MI	2 (4%)	17 (30%)	22.78	0.0001	0.40
Initiate	6 (7%)	16 (28%)	11.93	0.001	0.29
Working Memory	6 (7%)	24 (42%)	25.88	0.0001	0.42
Planning/Organization	5 (6%)	18 (32%)	17.32	0.0001	0.35
Task Monitor	5 (6%)	13 (23%)	9.16	0.002	0.25
Organization of Materials	2 (4%)	3 (4%)	0.90	0.342	0.08

*Note.* BRIEF-A = Behavior Rating Index of Executive Functioning-Adult; Non-ASD Traits = GEC = Global Executive Composite. BRI = Behavior Regulation Index. MI = Metacognition Index. Abnormally elevated T-scores on the BRIEF-A = > 65.

**Table 4***Adjustment to College in Students With and Without ASD Traits*

SACQ Scores	Without ASD Traits <i>n</i> = 84; <i>M</i> ( <i>SD</i> )	ASD Traits <i>n</i> = 84; <i>M</i> ( <i>SD</i> )	<i>t</i>	<i>p</i>	<i>d</i>
Academic Adjustment	42.54 (4.7)	43.14 (6.5)	-0.63	0.53	0.11
Social Adjustment	46.75 (5.7)	39.77 (4.6)	2.54	0.03	0.39
Personal Emotional Adjustment	51.48 (9.6)	38.40 (6.3)	2.87	0.001	0.50
Institutional Attachment	45.75 (5.3)	45.45 (4.7)	-0.34	0.74	0.06
Full Scale Score	43.01 (4.7)	41.75 (5.2)	-0.05	0.96	0.08

*Note.* SACQ = Student Adaptation to College Questionnaire; Higher scores reflect more adjustment. Approximately all *T*-scores were within one standard deviation of norm samples (50*T*; Baker & Siryk, 1999).

**Table 5***Relations Between ASD Symptomatology, Executive Dysfunction, Academic Performance, and Adjustment to College (SACQ) in Students With and Without ASD Traits*

Variable	1	2	3	4	5	6	7
1. SRS-2 <i>T</i> -score	-	.55***	0.20	-0.12	0.19	-0.30**	-0.05
2. GEC <i>T</i> -score	0.37**	-	0.19	-0.27**	0.14	-0.30**	0.06
3. GPA	0.18	0.13	-	-0.18	0.16	-0.19	-0.01
4. Academic Adjustment	0.17	0.11	0.11	-	0.35***	0.55***	0.45***
5. Social Adjustment	-0.26*	0.22	0.19	0.58***	-	0.14	0.61***
6. Personal Emotional Adjustment	-0.10	-0.03	-0.04	0.68***	0.43***	-	0.45***
7. Institutional Attachment	0.08	0.11	0.20	0.48***	0.76***	0.41**	-

*Note.* Correlation coefficients for students with ASD traits are presented in the bottom left of the correlation matrix (i.e., below dashed diagonal line) and correlation coefficients for students without ASD traits are presented in the upper right (i.e., above dashed diagonal line). SRS-2 = Social Responsiveness Scale, Second Edition. BRIEF-GEC: Behavior Regulation Index of Executive Functioning, Global Executive Composite. GPA = Grade point average. SACQ = Student Adaptation to College Questionnaire. \**p* < .05, \*\**p* < .01, \*\*\**p* < .001.

**Table 6***Regression Results Examining Predictors of Academic Outcomes*

Academic Outcome	Variable	<i>B</i>	<i>Adjusted R<sup>2</sup></i>	<i>Beta</i>	<i>t</i>	<i>Sig</i>
Academic Adjustment	SRS-2 <i>T</i> -Score	0.06	-0.01	0.10	0.87	<i>p</i> = 0.39
	GEC <i>T</i> -Score	-0.03		-0.07	-0.61	<i>p</i> = 0.54
Social Adjustment	SRS-2 <i>T</i> -Score	0.12	0.07	0.20	1.92	<i>p</i> = 0.05
	GEC <i>T</i> -Score	0.06		0.13	1.21	<i>p</i> = 0.23
Personal Emotional Adjustment	SRS-2 <i>T</i> -Score	-0.26	0.11	-0.26	-2.49	<i>p</i> = 0.01
	GEC <i>T</i> -Score	-0.07		-0.10	-0.95	<i>p</i> = 0.34
Institutional Attachment	SRS-2 <i>T</i> -Score	-0.06	-0.006	-0.10	-0.89	<i>p</i> = 0.37
	GEC <i>T</i> -Score	0.05		0.12	1.07	<i>p</i> = 0.29
GPA	SRS-2 <i>T</i> -Score	-0.01	0.003	-0.08	-0.76	<i>p</i> = 0.45
	GEC <i>T</i> -Score	0.02		0.17	1.54	<i>p</i> = 0.13

*Note.* SACQ = Student Adaptation to College Questionnaire. SRS-2 *T*-score = *T*-score from the Social Responsiveness Scale, Second Edition. GEC *T*-score = Global Executive Composite *T*-score from the BRIEF. GPA = Grade point Average.

To examine whether EF (GEC *T*-score) or ASD symptomatology (SRS-2 *T*-score) was a better predictor of college performance (GPA), a simultaneous regression analysis was performed with EF and ASD symptomatology entered as predictor variables. The overall model was not significant,  $F(2, 131) = 1.21$ ,  $p = .30$ , nor were the predictors (see Table 6). Simultaneous regression analyses were also performed for adjustment to college (i.e., academic, person-emotional, social, and institutional attachment). For each type of adjustment, both EF and ASD symptomatology were entered as predictor variables. The analyses showed that the overall model was significant for personal-emotional adjustment,  $F(2, 140) = 8.37$ ,  $p < 0.0001$ , and social adjustment,  $F(2, 140) = 6.47$ ,  $p < .002$ . However, the overall models were not significant for academic adjustment,  $F(2, 140) = .38$ ,  $p = .68$ , or for institutional attachment,  $F(2, 140) = .61$ ,  $p = .55$ . As shown in Table 6, ASD symptomatology was a significant predictor of social and personal-emotional adjustment to college, whereas EF did not predict college adjustment on any of the subscales (i.e., academic, social, person-emotional, institutional attachment).

## Discussion

Although more students with ASD are attending college than ever before, college completion rates remain low (Newman et al., 2011; Shattuck et al., 2012), making it imperative to better understand what may be impacting their ability to successfully navigate the post-secondary environment. It has been theorized that difficulties with EF, which are thought to be common among college students with ASD, contribute to their academic outcomes and adjustment (Shmulsky et al., 2017). However, few studies have examined this empirically. Therefore, in the present study, our goal was to characterize and compare EF, academic performance, and adjustment to college in students with and without ASD traits and to investigate the relations between these variables to better understand the impact of EF skills on students' academic outcomes.

Consistent with our predictions, students with ASD traits showed significantly greater executive dysfunction across all domains relative to students without ASD traits. The largest effect sizes were found for working memory and task monitoring aspects of metacognition, as well as self-monitoring. Notably, the findings for working memory and task monitoring corroborate the results of Wallace et al. (2016), who compared adults with ASD to a nor-

mative population sample provided in the BRIEF-A manual. The current study further expands on prior research by revealing EF difficulties in those with ASD traits (rather than a formal diagnosis), as well as significant associations between ASD symptomatology and executive dysfunction, highlighting the close ties between ASD symptomatology and EF even in the absence of a formal ASD diagnosis.

The present study also examined whether students with and without ASD traits differed in terms of adjustment to college (i.e., academic, social, personal-emotional and institutional attachment) and academic performance (i.e., GPA). Consistent with previous research (Trevisan & Birmingham, 2016), study findings showed significantly lower levels of adjustment on the social and personal-emotional scales of the SACQ in students with ASD traits. However, no significant differences were found between students with and without ASD traits in terms of academic adjustment and academic performance (GPA). Finally, the finding that institutional attachment did not significantly differ between groups was especially interesting and unexpected. This may be due to the fact that students with and without ASD symptomatology were generally satisfied with the academic environment of their institution and still had a broad desire to be in college. Overall, our results are consistent with past findings suggesting that social and emotional challenges in the college environment, rather than academic issues, may be the most salient barriers to successfully completing higher education for adults with ASD (see Anderson et al., 2019, for a review).

These findings could also have implications for practitioners. It is important to note that students' scores on all SACQ scales were significantly and positively related for both groups, where those with better adjustment on one dimension had better adjustment across all other dimensions. Therefore, it is possible that supporting or improving a students' adjustment in one area (e.g., social adjustment) may have benefits in other areas (e.g., personal-emotional adjustment). Moreover, counselors and support staff working directly with students may find that exploration of the individual items on the SACQ can highlight areas of difficulty for the student. Specifically, four components are captured by the social adjustment subscale: the extent to which the student perceives their success with social activities, their perception of their involvement and relationships with other persons on campus, their ability to deal with a new environment and social relocation (e.g., being away from family and friends), and overall satisfaction with the social aspects of college, including extracurricular activities. Not only should future studies more close-

ly examine individual items on the social adjustment scale to pinpoint the most salient areas of difficulty for students with ASD, but students' responses on the individual items may help counseling staff to specifically target students' needs. Likewise, further exploration of personal-emotional challenges (e.g., psychological distress and somatic problems) could prove valuable when providing support to students. Lastly, longitudinal research is needed to delineate the impact of poor social and personal-emotional adjustment on retention and academic performance across the school years.

It is equally important to identify factors that are predictive of adjustment difficulties in the college setting, as this could aid with identifying at-risk groups and appropriately targeting intervention efforts. In the regression model, only ASD symptomatology was a significant predictor of adjustment to college (social and personal-emotional). Thus, degree of ASD symptomatology may explain adjustment difficulties among college students with ASD traits, providing a foundational framework for future research. Nevertheless, given the extent to which students with ASD symptomatology exhibited executive dysfunction, one would expect EF to impact college performance in other ways that were not explored in the present study. For example, executive dysfunction may have a greater impact on students' performance as they proceed through their college years, and particularly in more challenging upper-level classes. In terms of recommendations from the present study, support programs that target specific EF skills, such as self-monitoring, planning and organizational skills, working memory, and task monitoring may be particularly valuable for students with ASD symptomatology.

Contrary to our hypothesis, neither EF nor ASD symptomatology was associated with academic performance in students. It is possible that other individual characteristics are more salient predictors of academic outcomes in college, particularly for individuals with ASD traits. In fact, past research suggests that performance self-efficacy and students' grade goals are two of the strongest predictors of academic performance (i.e., GPA) for the college population as a whole (Richardson et al., 2012). Additionally, the students in this study were in the early years of their college careers. As previously noted, additional research is needed to examine whether EF abilities show more impact longitudinally, as students proceed with their education.

Taken together, our findings indicate that college students with ASD symptomatology may benefit from programs that aim to provide extra psychosocial support. Colleges can implement programs that offer various support networks, such as weekly groups

focused on skill-building (e.g., stress management, social communication; Hillier et al., 2018) and social or recreational activities to assist with the transition from high school to the university setting. EF skills-building programs or coaches may also be beneficial, given the challenges in this area as shown in the present study. Finally, preliminary evidence suggests that formal transition programs may also help to ease adjustment to the college setting (Shmulsky et al., 2015; White et al., 2017).

It is important to note that a handful of college programs specifically targeting the unique and varying needs of students with ASD exist. These include, but are not limited to, Marshall University (Autism Training Center), University of Alabama (ASD Transition & Support Program), Drexel University (Drexel Autism Support Program) and Mercyhurst University (Autism Initiative). However, many colleges do not offer specific supports for students with ASD, instead providing only academic supports such as extra time for testing (Gelbar et al., 2015). Collaborations between disability service offices, campus mental health providers, and faculty scholars can help develop additional programs and ensure that students with ASD symptomatology are being connected to these services. From a practical standpoint, these types of programs could ultimately improve retention rates and the institution's reputation (Shmulsky et al., 2015).

### **Strengths and Limitations**

We believe that this study has multiple strengths, including the use of an ecologically valid EF measure (i.e., BRIEF-A), an emphasis on ASD traits with the inclusion of a large number of female participants, and a comparison group of students without ASD traits. Focusing on individuals with ASD traits, rather than those who have a formal ASD diagnosis, is advantageous as college students with ASD may choose not to disclose their diagnosis to the university or may be undiagnosed (Cox et al., 2017; Newman et al., 2011; White et al., 2011). This can interfere with research studies that recruit exclusively from student accessibility offices and potentially lead to selection bias. Given that females may be under-diagnosed with ASD (Hull et al., 2020), the relatively large number of female students in this study is a notable strength. The inclusion of a comparison group without ASD traits also allowed us to examine whether EF, academic performance, and college adjustment differs between those with and without ASD traits. Finally, students with and without ASD traits did not significantly differ across almost all demographic variables, limiting potential confounding variables. One significant difference between the groups did emerge, such

that those with ASD traits spent significantly more time studying than those without ASD traits. While outside the scope of this study, future research could explore reasons for this increased study time and whether this is a potential compensatory mechanism.

However, there are several limitations of the study that should be mentioned. First, data were collected via an online survey comprised of self-report questionnaires and administered pre-pandemic, so the potential for common method variance should be acknowledged. Second, our sampling method at a single institution, as well as the large number of female students and lack of diversity in the sample, may limit the study's generalizability to the college population as a whole. Future research should include larger samples with more racial, ethnic, and gender diversity. Moreover, it was beyond the scope of this study to explore the role that co-occurring conditions (e.g., elevated anxiety, mental health conditions) may have had on our study variables. Lastly, this study was cross-sectional and consisted mainly of freshman and sophomore students, limiting our understanding of how ASD symptomatology and executive dysfunction may impact long-term college outcomes. Future research should utilize a longitudinal design to corroborate our findings and examine predictors of academic performance and adjustment in advanced college students with and without ASD traits.

### **Conclusions and Implications**

Results from this study suggest that college students with ASD traits may demonstrate difficulties with EF, as well as social and personal-emotional adjustment, relative to those without ASD traits. However, ASD symptomatology, rather than EF, may be a better predictor of adjustment in the college setting for students in the early stages of their college careers. Overall, it may be helpful for universities to provide programming that offers both EF training and social and personal-emotional supports to positively impact the college experience of those with ASD traits. Unfortunately, our understanding of effective college programming for those with ASD remains limited (Gelbar et al., 2015), highlighting a need for additional research in this area.

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# Housing Insecurity Among Disabled Students During the COVID-19 Pandemic

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## Abstract

The purpose of this paper is to examine rates of college students' housing insecurity from September to November 2020 during the COVID-19 pandemic, with a focus on whether there are differences in disabled and nondisabled students' housing insecurity controlling for additional demographic variables and pandemic-related experiences. Using a large sample of 70,210 students enrolled at 130 community and technical colleges and 72 four-year colleges, we discovered that students with chronic illnesses, physical disabilities, psychological disorders, and multiple disabilities had significantly greater odds of experiencing housing insecurity compared to their peers. Students with cognitive, learning, or neurological disorders or disabilities and those who had no disabilities or medical conditions had significantly lower odds of experiencing housing insecurity compared to other students.

*Keywords: disabled students, housing insecurity, basic needs insecurity, COVID-19 pandemic*

Over the last several years, scholars have drawn attention to the growing rates of housing insecurity among college and university students in the U.S. (Broton & Goldrick-Rab, 2018; Goldrick-Rab et al., 2018). Current estimates suggest that between 38% to 56% of undergraduate students experience housing insecurity, which includes lacking the ability to pay rent, mortgage, or utilities, experiencing increases in the cost of housing that make it difficult to afford housing, lacking affordable housing alternatives, living with others beyond the expected capacity of the residence, staying temporarily with others (e.g., couch surfing), living in places not designed for human habitation (e.g., vehicle, outdoor location), moving three or more times in a year, or experiencing homelessness (Broton, 2020; Broton & Goldrick-Rab, 2018; Goldrick-Rab et al., 2018; Goldrick-Rab et al., 2019; Olfert et al., 2021; Soria et al., 2022; The Hope Center for College, Community, and Justice, 2021).

Although research on housing insecurity in college students has expanded in recent years, there are only

a few studies featuring analyses regarding whether there are different rates of housing insecurity by students' demographic characteristics. Researchers have focused primarily on whether there are differences in students' housing insecurity by students' race/ethnicity, age, income or socioeconomic status, sexual orientation, and sex or gender (Duran & Núñez, 2021; Goldrick-Rab et al., 2020; Olfert et al., 2021; Smith & Knechtel, 2020). At present, there is a dearth of literature in which scholars have analyzed housing insecurity rates among disabled students. Moreover, the existing literature is limited by aggregated measures of disability, limitations in housing insecurity measures, and descriptive (as opposed to inferential) analyses. For instance, Olfert et al. examined differences in housing insecurity by whether students have any disabilities (yes/no), finding that disabled students have higher rates of housing insecurity; however, the authors did not examine whether there are more nuanced differences in housing insecurity by students' type of disability (e.g., physical disability). Smith and

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Knechtel found that students with a disabling physical or psychiatric condition experienced higher rates of homelessness compared to their nondisabled peers; however, the authors only addressed homelessness, which affects a smaller proportion of college students than housing insecurity (Goldrick-Rab et al., 2019). Soria et al. (2020) also used limited measures when examining students' housing insecurity during the COVID-19 pandemic (i.e., lacking money to cover the costs of housing and unable to pay the costs of housing), although they disaggregated the analyses by three types of disabilities (physical, learning, neurodevelopmental or cognitive, and any combinations of the three). However, the study was descriptive in nature and the authors did not account for other demographic variables or COVID-19 related experiences when examining students' housing insecurity.

At present, there is a lack of understanding regarding the rates at which students with different types of disabilities experience housing insecurity. The omission of housing insecurity research on disabled college students is concerning due to the prevalence of disabled students in higher education and the serious implications of housing insecurity on disabled students' educational experiences and outcomes. Nearly one in five undergraduates has a disability and disabled students are more likely to come from low-income backgrounds (National Center for Education Statistics, 2021, 2022), which means they may have a greater likelihood of experiencing housing insecurity (Olfert et al., 2021; The Hope Center for College, Community, and Justice, 2021). Housing insecurity is associated with lower college completion rates among students (Broton, 2021; Smith & Knechtel, 2020; Wright et al., 2020), which could exacerbate the existing disparities in degree completion rates for disabled students (National Center for Education Statistics, 2022).

Moreover, housing insecurity is also linked with decreased academic performance (Broton, 2021), increased rates of food and financial insecurity (Haskett et al., 2020; Leung, et al. 2020; Martinez et al., 2021; Smith & Knechtel, 2020), and increased rates of distress and social isolation (Martinez et al., 2021). The lack of regular access to safe and secure housing (e.g., where they do not encounter abuse, have their basic needs met, do not experience danger, or feel safe with a sense of security) negatively affects students' psychological and mental health (Soria & Horgos, 2021; Wright et al., 2020). Lacking dependable housing increases chronic stress, which has been linked to decreases in cognitive function and physiological changes detrimental to the brain (Broton, 2021). The attendant outcomes of housing insecurity could there-

fore have disastrous implications for disabled college students, who already encounter significant structural barriers in higher education including ableism, faculty who do not provide accommodations, and a less welcoming campus climate, among other challenges (Hutcheon & Wolbring, 2012; Soria, 2021; Toutain, 2019; Zehner, 2018).

Housing insecurity is an even more important topic to analyze during the global COVID-19 pandemic because college students experienced higher rates of housing insecurity during the pandemic than prior to the pandemic (Glantsman et al., 2022; Sackey et al., 2022; Soria et al., 2022). In March of 2020, the World Health Organization declared a global pandemic for an outbreak of outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes coronavirus disease (COVID-19). The declaration of the global pandemic initiated a series of policies causing disruptive changes within U.S. higher education institutions. Some of the safety measures designed to lessen the spread of COVID-19 in spring 2020 included moving in-person classes to distance education modalities, encouraging non-essential staff and faculty to work remotely, and closing residence life facilities. Due to social distancing measures, many college students who were employed on- or off-campus lost hours, wages, jobs, and expected employment positions (e.g., spring or summer jobs or internships; Soria et al., 2022).

Several of those policies created financial hardships that may have led to the increases in housing insecurity. In addition to the lost wages or employment positions, college students also experienced unexpected increases in spending (e.g., for technology necessary to engage in online learning), students' families also encountered financial hardships (e.g., furloughs, loss of wages, lost jobs), and students experienced barriers in accessing emergency financial aid (Cornett & Fletcher, 2022; Goldrick-Rab et al., 2020; Soria & Horgos, 2021; Soria et al., 2022; The Hope Center for College, Community, and Justice, 2021). Further, many higher education institutions closed their on-campus housing facilities and required students to relocate off-campus in spring 2020, which meant that students lost access to not only their on-campus housing, but also their access to critical support services (Soria & Horgos, 2021; Soria et al., 2022; The Hope Center for College, Community, and Justice, 2021). As campuses closed their on-campus residences in spring 2020, some college students who relocated off campus moved into living environments where they experienced physical or emotional abuse, where their identities were not respected, and where they did not feel safe or protected, which could have

created further instability in their housing conditions (Soria & Horgos, 2021; Soria et al., 2022). Some students were also left stranded without housing because campuses abruptly closed without offering alternatives for those who did not have families or homes to which they could return (Goldrick-Rab et al., 2020).

Although most campuses reopened their on-campus housing facilities by fall 2020, many of the aforementioned factors, including financial hardships, may have continued to negatively affect students' housing security during the ongoing pandemic (Cornett & Fletcher, 2022; Soria et al., 2022). For instance, many students from underrepresented or marginalized backgrounds were expected to serve as caregivers for family members or had an increased obligation to financially support their family compared to before the pandemic, which could have exacerbated their housing insecurity (Cornett & Fletcher, 2022). While the limited extant research suggests that disabled students may have higher rates of housing insecurity, at present, there are no formal investigations of housing insecurity among disabled college students during the COVID-19 pandemic. Therefore, the purpose of this study is to examine the rates of housing insecurity experienced by disabled and nondisabled college students during fall 2020 of the pandemic. Specifically, the research question driving this study was: Do disabled college students have significantly different odds of experiencing housing insecurity compared to their nondisabled peers while controlling for additional demographic variables and COVID-19 experiences?

### Conceptual Framework

We used Glover et al.'s (2020) conceptual framework for mitigating the equity harms of COVID-19. The model stipulates that inequitable COVID-19 policies may generate harms upon individuals who were already marginalized, oppressed, and disenfranchised prior to the pandemic, including people with disabilities. For instance, stay-at-home policies or health restrictions may have reduced the ability for individuals with disabilities to work and earn wages at their pre-pandemic rates. Students (or their family members) who were unable to work from home and worked in spaces with high public contact may have been at a higher risk of exposure to COVID-19. Individuals with health risks or pre-existing medical conditions may have been at a greater risk of complications if they were infected with the virus.

Furthermore, disabled individuals who lost employment positions or the opportunities to work full-time hours may have lost access to medical insurance, thus exacerbating the financial expenses associated

with medical care and treatment. Glover and colleagues cited several demographic variables associated with equity harms due to COVID-19 policies, including disability, employment, race/ethnicity, gender, family education, and socioeconomic status. We used many of those variables in our analysis when we examined whether there are significant disparities in college students' housing insecurity by their disabilities.

### Methodology

#### Instrument and Sample

We used data from the 2020 #RealCollege Survey (The Hope Center for College, Community, and Justice, 2022), which was administered to 1.84 million college students at 130 community and technical colleges and 72 four-year colleges in 42 states between September and November 2020. The survey was emailed to students and it was framed as a survey about college life, not about basic needs insecurity. The response rate averaged 10.6% ( $n = 195,629$ ), although only a smaller subset of 70,210 students answered all the COVID-19 experience items used in the present analysis. Although low, the response rate was the highest for any #RealCollege Survey administration and comparable to response rates for similar surveys (Betancourt & Wolff-Eisenberg, 2019; California Student Aid Commission, 2020; The Hope Center for College, Community, and Justice, 2021).

The demographic information from the final sample used in the analysis is shown in Table 1. Students responded yes/no regarding whether they had a disability in six areas: chronic illness, physical disability, psychological disorder, other disability or medical condition, no disability, or cognitive, learning, or neurological disorder/disabilities. We summed the disability categories to create a category for students who had multiple disabilities, which was the largest group of disabled students in the sample (Table 1). Notably, 48% of students who responded to the disability-related items had at least one disability. While that number is higher than appears in many surveys, it is consistent with other #RealCollege survey administrations and may reflect the growing number of college students who have disabilities (The Hope Center for College, Community, and Justice, 2020). The three largest groups of disabilities included 19.4% of students who had multiple disabilities, 17.8% who had a psychological disorder (e.g., depression, anxiety), and 5.1% who had a chronic illness (e.g., autoimmune disorders). The majority of respondents were women (70.5%), 59.8% were enrolled full time, 57.2% attended a two-year community or technical college, and 96.0% were U.S. citizens or permanent residents.

**Table 1***Descriptive Statistics for the Sample*

	<i>n</i>	%
<i>Disability</i>		
Chronic illness (e.g., autoimmune disorders)	3,583	5.1
Cognitive, learning, or neurological disorder or disability (e.g., dyslexia)	2,601	3.7
Other disability or medical condition not listed in the survey	616	0.9
Physical disability (e.g., speech, sight, mobility, hearing)	804	1.1
Psychological disorder (e.g., depression, anxiety)	12,514	17.8
Multiple disabilities	13,590	19.4
No disability or medical condition	36,502	52.0
<i>Gender</i>		
Woman	49,468	70.5
Man	18,102	25.8
Nonbinary	852	1.2
Transgender	990	1.4
Prefer to self-describe or not to provide gender	798	1.1
<i>Race/Ethnicity</i>		
White	34,014	48.4
Black or African American	6,961	9.9
Middle Eastern, North African, Arab, or Arab American	610	0.9
Southeast Asian	1,399	2.0
American Indian or Native American	346	0.5
Hispanic, Latinx, or Chicanx	12,276	17.5
Pacific Islander or Native Hawaiian	197	0.3
Other Asian or Asian American	2,817	4.0
Multiracial	10,004	14.2
No race/ethnicity provided	1,586	2.3
<i>Sexual Orientation</i>		
Heterosexual or straight	54,021	76.9
Gay or lesbian	2,811	4.0
Bisexual	8,115	11.6
Prefer to self-describe sexual orientation	2,122	3.0
Prefer not to answer sexual orientation	3,141	4.5
<i>Economic Background</i>		
Family had trouble making ends meet financially growing up	29,606	42.2
Family did not have trouble making ends meet financially growing up	40,604	57.8
<i>Parental Education</i>		
Continuing-generation (parents have $\geq$ a bachelor's degree)	25,526	36.4
First-generation (parents have $<$ a bachelor's degree)	44,684	63.6
<i>Living with a Spouse or Partner</i>		
Student does not live with a spouse or partner	51,413	73.2

(Table 1 Continued)

	<i>n</i>	%
Student lives with a spouse or partner	18,797	26.8
<i>Enrollment Intensity</i>		
Full-time student	42,018	59.8
Part-time student	28,192	40.2
<i>Foster Care Experience</i>		
Student has been in foster care	1,608	2.3
Student has not been in foster care	68,602	97.7
<i>Citizenship</i>		
U.S. citizen or permanent resident	67,376	96.0
International student or non-citizen	2,834	4.0
<i>Parent, Guardian, or Caregiver to Children</i>		
Student is a parent, guardian, or caregiver to children	13,026	18.6
Student is not a parent, guardian, or caregiver to children	57,184	81.4
<i>Type of Institution</i>		
Two-year college	40,163	57.2
Four-year college or university	30,047	42.8
<i>Institution's Location</i>		
College is in the Midwest	11,756	16.7
College is in the South	22,441	32.0
College is in the Northeast	8,941	12.7
College is in the West	27,072	38.6
<i>Food Insecurity</i>		
Experiencing food insecurity	25,556	36.4
Not experiencing food insecurity	44,654	63.6
<i>Sources of Financial Aid</i>		
Uses Pell grants to pay for college	32,833	46.8
Uses student loans to pay for college	24,944	35.5
Has a job to pay for college	45,997	65.5
Pays for college with support from family/friends	36,886	52.5
<i>COVID-19 Experiences</i>		
Had to take care of a family member while attending class	28,159	40.1
Had to help children in the home with their schooling while attending classes	21,413	30.5
Lost a job	22,239	31.7
Struggled to pay to go back home	8,451	12.0
Could not afford to go back home	4,633	6.6
Experienced cuts to hours or pay at work	31,222	44.5
Experienced an increase in hours or pay at work	11,977	17.1
Worked as a frontline worker supporting COVID	9,354	13.3
Was sick with COVID	4,691	6.7
A close friend or family member was sick with COVID	28,626	40.8
A close friend or family member died of COVID	8,680	12.4

## Measures

### *Dependent Variable*

The 2020 #RealCollege Survey assessed students' housing insecurity using ten items (e.g., "In the past 12 months, was there a rent or mortgage increase that made it difficult to pay?"). The full list of housing insecurity survey items by students' disability categories are shown in Table 2. Students experienced housing insecurity if they responded "yes" to any of the housing insecurity items of the survey or indicated that they had moved at least three times in the last year (The Hope Center for College, Community, and Justice, 2021). In the final sample, 49.6% of all students were experiencing housing insecurity.

### *Independent Variables*

Students reported all demographic and college experience variables, which we converted using effect coding (Mayhew & Simonoff, 2015) except in the case of variables with dichotomous categories (e.g., full-time or part-time enrollment). Dummy coding omits one group (the common referent group) from analysis of variables with more than two categories (e.g., race/ethnicity, gender); however, in effect coding, the coefficients or odds ratios are interpreted relative to the average of the full sample and all groups can be included in analyses (Ro & Bergom, 2020). With the dichotomous variables, each coefficient or odds ratio can be interpreted compared to the other level (e.g., students enrolled full time can be compared to students enrolled part time). In addition to the demographic variables provided in Table 1, we also included students' age ( $\bar{x} = 26.0$ ,  $s = 9.44$ ) and total years enrolled in college ( $\bar{x} = 2.93$ ,  $s = 1.91$ ).

The 2020 #RealCollege Survey assessed students' food security using the U.S. Department of Agriculture's (USDA, 2012) 18-item set of questions. While most of the items were phrased as "yes/no" questions (e.g., "In the last 30 days, were you ever hungry but didn't eat because there wasn't enough money for food?"), some were scaled "never true," "sometimes true," or "often true" (e.g., "In the last 30 days, I couldn't afford to eat balanced meals"). The yes/no items were coded as no = 0, yes = 1 and the other items were recoded as never true = 0, sometimes or often true = 1. Students who reported that there were children under the age of 18 present in the home also responded to items assessing food security for the children (e.g., "In the last 30 days, did you ever cut the size of your children's meals because there wasn't enough money for food?"). The sum of affirmative responses represents students' raw food security score. Students who had scores between 0 and 2 experienced marginal or high food security

while all others were experiencing low or very low food security, which we dichotomized to 0 = student is not experiencing food insecurity (raw score 0-2) and 1 = student is experiencing food insecurity (raw score 3-18). In the sample, 36.4% of students were experiencing food insecurity.

Students also shared information about their experiences during the COVID-19 pandemic. We used 11 items in which students shared experiences such as taking care of family members or children in the home while attending classes or losing employment, wages, or hours (Table 1). Students responded "yes or no" to those items and the most common experience was losing hours or pay at work (44.5%; Table 1). The Hope Center for College, Community, and Justice (2021) has drawn attention to the disparities in students' COVID-19 experiences by demographic characteristics, primarily race and ethnicity, gender, type of institution, and parenting status; however, researchers have not explored disparities by students' disabilities. We also included items in which students shared how they pay for college (i.e., through loans, Pell grants, with a job, or with support from family or friends).

### **Data Analyses**

First, we analyzed the descriptive statistics for students' responses to the housing insecurity items by the disability demographic variables by examining the counts and frequencies. Next, we analyzed the data using a multivariate logistic regression to examine the odds of experiencing housing insecurity controlling for demographic variables and COVID-19 experiences. Hosmer and Lemeshow's (2000) test statistic was non-significant ( $p > .05$ ) and suggested model adequate fit. The model properly classified 73.9% of the cases.

### **Limitations**

Our research study is cross-sectional and the data were collected in fall 2020; as a result, the limited snapshot of students' experiences with housing insecurity may not reflect changes as the pandemic has progressed and the findings may not be applicable to students' experiences in other academic years in the future. The effect sizes are small for most of the independent variables (Chen et al., 2010), which means that there are other variables not measured in the present study that may better be associated students' housing insecurity. The way the items related to students' disabilities were constructed was also limited and we were unable to capture insights for some specific disabilities or medical conditions (e.g.,



autism spectrum disorder). Finally, although our research study has a large sample, the response rates in the individual campuses were low and there was also significant item response drop off as students progressed to the survey, factors that could increase response bias (Fosnacht et al., 2017). While the low response rates were similar to other surveys of basic needs insecurity (Baker-Smith et al., 2020; Betancourt & Wolff-Eisenberg, 2019; California Student Aid Commission, 2020), the lower response limit generalizability of the sample to the greater population of students in the U.S.

## Results

The results of the first analyses suggest there are some descriptive differences in students' responses to the housing insecurity items by the disability demographic variables. Students with multiple disabilities (those who selected more than one disability category) were more likely to select affirmative responses to most of the housing insecurity items compared to other students (Table 2). For instance, 30.6% of students with multiple disabilities did not pay the full amount of utilities, 30.1% were unable to pay or underpaid rent or mortgage, and 19.9% experienced homelessness in the past 12 months. In fact, compared to all others, those with multiple disabilities were more likely to experience housing insecurity (59.3%).

Some additional descriptive differences that emerged from the analyses as well. Students with psychological disabilities had higher affirmative responses to some (but not all) of the housing insecurity items compared to their peers. In general, there were many nuances in the descriptive results that warrant additional attention; for instance, there were some survey items in which nondisabled students had higher affirmative responses compared to disabled students (e.g., 11.1% of nondisabled students experienced homelessness compared to 10.3% of students with chronic illnesses, 20.7% of nondisabled students were unable to pay or underpaid the costs of housing compared to 18.5% of students with cognitive, learning, or neurological disorder or disability).

Next, the results of the logistic regression suggest that there are some differences in the odds of experiencing housing insecurity when considering the presence of additional demographic variables and COVID-19 experiences (Table 3). Students with chronic illnesses, physical disabilities, psychological disorders, and multiple disabilities had significantly greater odds of experiencing housing insecurity compared to other students (OR = 1.125,  $p < .001$ , OR = 1.137,  $p < .001$ , OR = 1.105,  $p < .001$ , and OR =

1.242,  $p < .001$ , respectively). Students with cognitive, learning, or neurological disorders or disabilities had significantly lower odds of experiencing housing insecurity compared to other students (OR = 0.879,  $p < .001$ ). Students with no disabilities or medical conditions also had significantly reduced odds of experiencing housing insecurity compared to their peers (OR = 0.907,  $p < .001$ ).

While the purpose of this paper was to primarily focus on housing insecurity among disabled and non-disabled students, there are some additional demographic differences in housing insecurity that may be important for practitioners to consider. For instance, transgender, Black or African American, American Indian or Native American, and Hispanic, Latinx, or Chicanx students all had greater odds of experiencing housing insecurity compared to their peers. Students with spouses or partners, full-time students, students previously in the foster care system, international students, and students who are parents also had significantly greater odds of experiencing housing insecurity.

Furthermore, some economic indicators were also associated with increased odds of experiencing housing insecurity. Students who were from low-income backgrounds, have Pell grants and student loans, are employed, experience food insecurity, and who attend a college in the western U.S. also have greater odds of experiencing housing insecurity. Finally, students who had negative COVID-19 related experiences, by and large, were more likely have increased odds of experiencing housing insecurity. Students who lost a job during the pandemic were over twice as likely as their peers to experience housing insecurity.

## Discussion and Recommendations

The results of our present study are congruent with other observations about disabled students' housing insecurity during the COVID-19 pandemic (Horgos et al., 2020; Soria et al., 2020): by and large, disabled students were more likely to experience housing insecurity compared to nondisabled students, although those results were not always consistent among all disability groups. Even though most campuses had reopened their on-campus residences by fall 2020 and returned to in-person classes (often with social distancing or masking policies in place), the initial disruption of the pandemic may have had continued effects on disabled students. Approximately 40-60% of disabled students experienced housing insecurity in fall 2020 and many lacked financial resources to pay rent, mortgage, or utilities or experienced an increase in the cost of housing that was difficult to pay.

Table 2

*Housing Insecurity by Disability*

	No Disability or Medical Condition <i>n, %</i>	Chronic Illness <i>n, %</i>	Cognitive, Learning, or Neurological Disorder or Disability <i>n, %</i>	Physical Disability <i>n, %</i>	Psychological Disability <i>n, %</i>	Multiple Disabilities <i>n, %</i>	Other Disability or Medical Condition <i>n, %</i>
Experienced housing insecurity in the past 12 months	16,494 45.2%	1,793 50.0%	1,100 42.3%	384 47.8%	6,680 53.4%	8,060 59.3%	294 47.7%
Homeless in the last 12 months	4,047 11.1%	370 10.3%	324 12.5%	110 13.7%	1,936 15.5%	2,699 19.9%	72 11.7%
Unable to pay or underpaid rent or mortgage in the past 12 months	7,538 20.7%	820 22.9%	482 18.5%	150 18.7%	3,050 24.4%	4,085 30.1%	130 21.1%
Not paid the full amount of utilities in the past 12 months	7,509 20.6%	931 26.0%	440 16.9%	160 19.9%	3,019 24.1%	4,160 30.6%	159 25.8%
Had a rent or mortgage increase that was difficult to pay in the past 12 months	5,480 15.0%	534 14.9%	334 12.8%	123 15.3%	1,887 15.1%	2,583 19.0%	113 18.3%
Moved in with other people due to financial issues in the past 12 months	3,706 10.2%	382 10.7%	289 11.1%	89 11.1%	1,854 14.8%	2,386 17.6%	66 10.7%
Had an account default or go into collections in the past 12 months	3,490 9.6%	499 13.9%	249 9.6%	89 11.1%	1,632 13.0%	2,638 19.4%	83 13.5%
Lived with others beyond the capacity of the residence in the past 12 months	2,727 7.5%	277 7.7%	206 7.9%	82 10.2%	1,180 9.4%	1,633 12.0%	60 9.7%
Moved at least three times in the past 12 months	2,586 7.1%	288 8.0%	210 8.1%	75 9.3%	1,307 10.4%	1,421 10.5%	39 6.3%
Lived in a household where they felt unsafe in the last 12 months	2,287 6.3%	246 6.9%	202 7.8%	81 10.1%	1,498 12.0%	2,257 16.6%	62 10.1%
Received a summons to appear in housing court in the last 12 months	323 0.9%	29 0.8%	23 0.9%	11 1.4%	92 0.7%	167 1.2%	10 1.6%

**Table 3***Logistic Regression Analysis for Students' Housing Insecurity (n = 70,210)*

	OR	p	95% Confidence Interval (OR)	
			Lower Bound	Upper Bound
Chronic illness	1.125	***	1.076	1.252
Cognitive, learning, or neurological disorder or disability	0.879	***	0.805	0.960
Other disability or medical condition	0.885		0.751	1.041
Physical disability	1.137	***	1.041	1.242
Psychological disorder	1.105	***	1.047	1.166
Multiple disabilities	1.242	***	1.176	1.311
No disability or medical condition	0.907	***	0.867	0.950
Woman	0.990		0.932	1.052
Man	1.010		0.951	1.073
Nonbinary	0.967		0.843	1.109
Transgender	1.156	*	1.016	1.315
Prefer to self-describe or not to provide gender	1.038		0.901	1.196
White	0.887	***	0.836	0.941
Black or African American	1.245	***	1.156	1.342
Middle Eastern, North African, Arab, or Arab American	1.037		0.868	1.239
Southeast Asian	0.798	***	0.705	0.903
American Indian or Native American	1.280	***	1.008	1.626
Hispanic, Latinx, or Chicanx	1.098	***	1.029	1.173
Pacific Islander or Native Hawaiian	0.928		0.678	1.270
Other Asian or Asian American	0.773	***	0.702	0.851
Multiracial	0.952		0.890	1.018
No race/ethnicity provided	1.051		0.982	1.124
Heterosexual or straight	0.944	***	0.907	0.981
Gay or lesbian	0.993		0.942	1.047
Bisexual	1.007		0.955	1.062
Prefer to self-describe sexual orientation	1.094	*	1.003	1.193
Prefer not to answer sexual orientation	0.921	*	0.855	0.992
Family had trouble making ends meet financially growing up	1.401	***	1.349	1.455
Continuing generation (parents have $\geq$ a bachelor's degree)	1.042	*	1.000	1.085
Student lives with a spouse or partner	1.103	***	1.054	1.154
Full-time student	1.064	**	1.021	1.110
Student has been in foster care	1.459	***	1.284	1.658
U.S. citizen or permanent resident	0.625	***	0.569	0.688
Student is a parent, guardian, or caregiver to children	1.300	***	1.221	1.383
Age	1.011	***	1.009	1.014
Two-year college	0.945	*	0.904	0.989

(Table 3 Continued)

	OR	p	95% Confidence Interval (OR)	
			Lower Bound	Upper Bound
Total years enrolled in college	0.999		0.989	1.010
College is in the Midwest	0.972		0.910	1.038
College is in the South	0.949		0.895	1.007
College is in the Northeast	1.029		0.963	1.099
College is in the West	1.198	***	1.130	1.270
Food insecurity	4.352	***	4.183	4.529
Uses Pell grants to pay for college	1.274	***	1.226	1.324
Uses student loans to pay for college	1.367	***	1.313	1.424
Has a job to pay for college	1.176	***	1.128	1.227
Pays for college with support from family/friends	1.044	*	1.005	1.084
Had to take care of a family member while attending class	1.430	***	1.373	1.490
Had to help children in the home with their schooling while attending classes	1.091	***	1.041	1.144
Lost a job	2.622	***	2.438	2.820
Struggled to pay to go back home	1.585	***	1.432	1.755
Could not afford to go back home	1.636	***	1.571	1.704
Experienced cuts to my hours or pay at work	1.469	***	1.412	1.529
Experienced an increase in hours or pay at work	0.986		0.938	1.037
Worked as a frontline worker supporting COVID	1.283	***	1.214	1.357
Was sick with COVID	1.155	***	1.072	1.245
A close friend or family member was sick with COVID	1.234	***	1.186	1.285
A close friend or family member died of COVID	1.163	***	1.095	1.236
Constant	0.196	***		

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ;  $\chi^2 = 18014.768$ ,  $df = 56$ ,  $p < .001$ ; pseudo- $R^2$  values 0.272 (Cox & Snell, 1989) and 0.363 (Nagelkerke, 1991).

The descriptive analyses (Table 2) point to some concerning trends in students' experiences with housing insecurity. High proportions of disabled students (~19%-30%) were unable to pay the full cost of their rent or mortgage while nearly equally high rates (~17%-31%) did not pay the full amount of the cost of their utilities. Many disabled college students lost jobs, hours, and wages during the pandemic, including the loss of wages or income from family. Further, significant proportions of disabled students also experienced financial challenges, such as food insecurity and sudden increases in spending for technology or living expenses (Soria et al., 2020). Those financial burdens likely made it more difficult for disabled students to

pay the cost of their housing and utilities on time, thereby increasing housing insecurity rates among disabled students. While many of those challenges are related to policies enacted during the pandemic (Glover et al., 2020), some are also reflective of the ongoing economic fallout of the pandemic in society. For instance, inflation and the costs of off-campus student housing continue to rise precipitously, with some college towns and neighborhoods experiencing up to a 30% increase in the cost of off-campus student rentals compared to the previous year (Marcus, 2022). While on-campus housing may be a more affordable option for disabled students attending four-year colleges or universities, the demand for on-campus housing often

exceeds the supply, the costs of on-campus housing are rising and have outpaced the cost of tuition and fees, and disabled students may encounter ableism in on-campus housing, leaving them unable to live on campuses with housing policies that do not accommodate or prioritize their disabilities (Ma & Pender, 2021; Marcus, 2022; Wilke et al., 2019).

It is troubling that such high percentages of disabled students (~10%-20%) experienced homelessness during the COVID-19 pandemic. Homelessness is the most severe form of housing insecurity and it is associated with food insecurity, lower academic performance, physical and mental health concerns, trauma, and lower degree completion (Hallett & Freas, 2018; Haskett et al., 2020; Miller, 2011; Shankar-Brown, 2017; Smith & Knechtel, 2020; Tobin, 2016). Students who experience homelessness sometimes report that they often go to extreme lengths just to get by, including trading sex for money or shelter, and they also report high rates of being violently attacked, visiting emergency rooms, and being hospitalized for more than 24 hours (Smith & Knechtel, 2020). Such unsafe and risky situations could potentially exacerbate disabled students' medical conditions or disabilities, leading to long-term negative consequences that affect many areas of their lives.

When controlling for demographic variables and pandemic-related experiences, we also discovered that students with chronic illnesses, physical disabilities, psychological disorders, and multiple disabilities had significantly greater odds of experiencing housing insecurity compared to other students (Table 3). Further, students with cognitive, learning, or neurological disorders or disabilities had significantly lower odds of experiencing housing insecurity compared to other students. Like Soria et al. (2020), we found that students with cognitive, learning, and neurological disabilities had among the lowest rates of housing insecurity among all disability groups. We speculate that students with chronic illnesses, physical disabilities, psychological disorders, and multiple disabilities may have been more negatively affected by the pandemic than students with cognitive, learning, or neurological disabilities. Soria et al. and Horgos et al. (2020) discovered that students with physical, psychological, and multiple disabilities experienced more financial hardships compared to students with other types of disabilities and nondisabled students. It may be the case that students with physical, psychological, and multiple disabilities experienced greater challenges in securing or maintaining employment due to the risks involved with exposure to the coronavirus. Or, if they contracted COVID, the effects may have been more detrimental, costing

more in health care expenses or lost wages due to the inability to work.

We recommend that higher education practitioners, administrators, and faculty take several steps to better support disabled college students who are experiencing housing insecurity. Practitioners should measure rates of housing insecurity on their own campuses and include demographic measures related to students' disabilities. Armed with data about the rates of housing insecurity among disabled students, faculty and practitioners can direct resources, programs, or services to the students who may benefit the most from additional support. Faculty and practitioners can also more effectively advocate for more institutional, local, state, or governmental resources to support students and their unique needs.

While we encourage basic needs insecurity data to be collected at the institutional level, it is also possible for practitioners to collect the data within disability support services offices, where students can respond to survey items about housing insecurity or other basic needs insecurity while completing the intake process. We encourage practitioners to frame their surveys as generic "college experience" surveys (like in the #RealCollege survey). If surveys are framed as "basic needs insecurity" surveys, some students may not respond to the items because they do not recognize their own situations relative to food or housing insecurity (Martinez et al., 2021; Smith & Knechtel, 2020). Students may inaccurately assume that housing insecurity only includes homelessness and thus recuse themselves from survey participation (Martinez et al., 2021; Smith & Knechtel, 2020); therefore, framing the survey as an overview of students' collegiate experiences may help practitioners to capture more accurate data related to the prevalence of housing insecurity among students.

At the institutional level, administrators and practitioners can create a "single point of contact" model to support students with wraparound services (Brotton, 2021; Crutchfield et al., 2019; Nix et al., 2021). The wraparound services can help students access a variety of services in a "one-stop" fashion rather than being directed to different offices or resources on campus and could also feature a dedicated advisor who is assigned to each student. Students experiencing housing insecurity are also likely to experience food insecurity and mental health disorders—and navigating complex institutional support systems can exacerbate students' levels of stress (Brotton, 2021; Gupton, 2017; Mulrenan et al., 2017; Soria & Horgos, 2021). Among practitioners, faculty, and students, there is a general lack of understanding related to the availability of governmental programs, in-

cluding whether students might be eligible for those programs, what those programs provide, and how to apply (Larin, 2018). It may therefore be unrealistic for practitioners (e.g., in disability support services) and faculty to navigate those systems and may be preferable to have dedicated practitioners working in a “single point of contact office” who are trained to help students identify their eligibility and apply for governmental assistance (Crutchfield et al., 2016). A single point of contact resource center also provide holistic support and resources to students including offering counseling services, determining eligibility for emergency aid or grants, completing the Free Application for Federal Student Aid (FAFSA) form, applying for public assistance programs (e.g., Social Security benefits, health or disability insurance, or the Supplemental Nutrition Assistance Program [SNAP]), working with staff in governmental agencies (e.g., state vocational rehabilitation services), seeking emergency housing or shelter, obtaining free nutritious food, or locating employment opportunities (Broton & Goldrick-Rab, 2016; Nix et al., 2021).

The rising costs of higher education coupled with stagnant funding opportunities for students have resulted in a gap between what students receive for financial aid and the funds that are necessary to afford educational necessities (e.g., textbooks) and cover basic needs, including food, housing, transportation (Goldrick-Rab, 2016). The costs of higher education are disproportionately higher for disabled students (Fox et al., 2021), so we encourage higher education administrators to lower prices for students by offering sliding scales for on-campus housing based upon students’ financial situations, eliminating on-campus housing application fees, creating lists of affordable off-campus housing opportunities, developing partnerships with local rental offices, and offering support for students who need to navigate housing-related situations such as landlord disputes, housing discrimination, or eviction (Broton, 2021; Soria et al., 2022). To support disabled students, we also recommend that higher education administrators eliminate fees related to diagnosis, assessment, testing, making course materials accessible, or other services, which could help students redirect financial resources to support their basic needs.

Finally, there are additional steps administrators, practitioners, and faculty can take to support disabled students experiencing housing insecurity. Faculty can add information to their syllabi to direct students to campus services where they can receive assistance with basic needs insecurity (Soria et al., 2022). Faculty can also embed links to those services in their learning management systems and share information and resources in class (Soria et al., 2022). Adminis-

trators and practitioners should ensure that there are enough affordable and accessible housing opportunities to meet disabled students’ needs on campus or help students locate affordable and accessible housing off-campus. For on-campus housing, practitioners should reserve spaces in advance of each academic year to accommodate students with disabilities or renovate existing housing spaces to be more accommodating to the changing needs of disabled students (e.g., adding more single rooms; Wilke et al., 2019). Additionally, all stakeholders—administrators, practitioners, faculty, and students—can actively lobby for local, state, and federal legislation to support students’ housing needs. For instance, in the state of Washington, Senate Bill 5738 (2019) was introduced to require four-year colleges and universities to support homeless students by providing free or reduced-price meals if the institution offers a culinary program; developing a capital plan to renovate an existing campus facility to include laundry facilities, storage units, showers, and lockers; and engaging with local housing authorities to provide rental assistance programs. We encourage all stakeholders to lobby for additional local, state, and federal policies to alleviate disabled students’ basic needs insecurity.

## Conclusion

The results of this study suggest that college students with chronic illnesses, physical disabilities, psychological disorders, and multiple disabilities had significantly greater odds of experiencing housing insecurity compared to other college students. We found that disabled students experienced concerning high rates of housing insecurity, including homelessness. We encourage administrators, practitioners, faculty, and students to work to address housing insecurity among disabled college students by collecting data on their own campuses, creating resource centers to support students, changing policies and practices on their campuses, and advocating for legislation to support college students’ basic needs.

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# Mediation Effects of Academic Advising Behaviors for First-Year Students with Learning Disabilities and Mental Health Disorders

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## Abstract

Using survey data from 6,242 first-year students with disabilities that completed the National Survey of Student Engagement and the academic advising topical module, the purpose of the current study was to explore the aspects of academic advising behaviors that mediated overall self-reported grades and student engagement. Findings indicate academic advising is positively related to grades and engagement among students with disabilities; however, some advising practices were more beneficial for students with certain disabilities than others.

*Keywords: academic advising, students with disabilities, student engagement, survey research*

Students with disabilities comprise an increasing percentage of the higher education US student population every year. 19% of students reported a disability in 2016, compared with only two-thirds of that number in 2015 (Snyder et al., 2019; Snyder, et al., 2018). Quantifying prevalence of specific disabilities among students is problematic due to widely inconsistent definitions and other infrastructure failings (Fujiura & Rutkowski-Kmitta, 2001) such as a lack of allocated effort to keeping track of college students with disabilities in the same way as with secondary and pre-secondary education, some estimates do exist (Evans et al., 2017).

At four-year institutions, as reported by the Higher Education Research Institute (Stolzenberg et al., 2019), students with learning disabilities made up about 20% of the population of students with disabilities; students with AD(H)D comprised 32%, students with mental illness 26%, students with health impairments 12%, students with hearing, mobility, sight, or speech disabilities 18.5%, and students with all others made up the remaining 3%. Given these numbers, and the fact that students with disabilities have higher

attrition rates and do not graduate as quickly as their peers unless academic support services are offered and effective (Hartley, 2010; Troiano et al., 2010), institutions should recognize the imperative to tailor support for this significant group of students.

The purpose of this paper is to illuminate, using advanced statistical analysis of large survey data, how academic advising relates to grades and engagement experiences and contributes to the achievements of these outcomes for students with disabilities, specifically students with learning disabilities and students with mental health disorders. Focusing on academic advising is worthwhile as it will allow institutions to intentionally direct effort and resources. For students with disabilities in particular, academic advising is crucial as it is often a connecting point to other services on campus (Aune, 2000). Additionally, intrusive advising has been shown to be effective in improving engagement for students with learning disabilities (Abelman & Molina, 2002). Intrusive advising, “utilizes the systematic skills of prescriptive advising while helping to solve the major problem of developmental advising which is a student's reluctance to

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self-refer” (Earl, 1988, p. 28). In the current study, intrusive advising was applied specifically to at-risk students with learning disabilities and included requiring students to substantively meet with advisors to create a formal contact of academic expectations.

Academic advising, as a functional area that affects every student’s experience, is an embodiment of institutional goals and vision, is a natural starting point for analysis and change (Zhang et al., 2017; Abelman & Molina, 2006). Since student engagement is the aspect of higher education quality of experience examined in the current study, our review of the literature includes research on the engagement of students with disabilities and the ways this aspect manifests in academic advising. On the National Survey of Student Engagement Academic Advising Topical Module, students are asked about the frequency and intensity of behaviors from their academic advisors. Behaviors include advising actions and characteristics such as listening to concerns and questions, being available when needed, etc. The Topical Module does not specifically define what role the advisor occupies, (e.g., faculty or counselor); therefore, in the current study, we consider any person that dispenses academic advice to students to be an academic advisor. Our literature review is structured regarding the three Engagement Indicators from the National Survey of Student Engagement (NSSE 2019a) that are the most cited within this literature: Supportive Environment, Student-Faculty Interaction, and Quality of Interactions. The following research questions guided our study:

1. How does academic advising behavior relate to grades and engagement among first-year students with disabilities?
2. For students with learning disabilities, students with mental health disabilities, and students with both a learning disability and mental health disability, how do aspects of academic advising mediate these outcomes?

### **Engagement of Students with Disabilities**

Student engagement is regarded as an important aspect of quality of experience within higher education (Kuh, 2001). Kuh (2003) describes student engagement as “the time and energy students devote to educationally sound activities inside and outside of the classroom, and the policies and practices that institutions use to induce students to take part in these activities” (p. 25). The current study is intended to answer modern calls to update this understanding for use with diverse populations (Quaye & Harper, 2015).

Specifically, for students with disabilities, scholars have proposed that engagement related to academic advising, faculty interaction, and supportive environments would be particularly beneficial (Brown & Broido, 2015). Previous studies in the field have demonstrated the ways that students with disabilities are engaging with the campus environment. Accommodations made using Disability Support Services (DSS) are particularly helpful for students with psychological impairments in supporting their achievement of academic goals (Stein, 2013). An important aspect of success for this group was a sense of belonging, which was influenced by three factors: self-advocacy, social relationships, and mastery (Vaccaro et al., 2015). Additionally, independence, personal agency, and individual responsibility are related to academic achievement, as measured by GPA, among students with mental health concerns (Brockelman, 2009).

### **Supportive Environment**

The campus climate is among the most influential factors in the college experience of students with disabilities (Dowrick et al., 2005). Hedrick et al. (2010) found that students who reported having a disability on the National Survey of Student Engagement (NSSE) were less likely than their peers to find their campus environment to be supportive and were more likely to be poorly adjusted to the academic environment than their peers (Murray et al., 2014). Students who are poorly adjusted score lower on self-advocacy, course self-efficacy, social efficacy, family support, and campus climate than students in the average and highly adjusted groups. In other words, students with disabilities are more likely to include a supportive environment as a component of their pathway to success and are less likely than their peers to perceive their campus environment as supportive. It is therefore necessary to consider ways in which educators, staff, and administrators can provide supportive interventions for students with disabilities that will improve their perception of the campus environment. It is for this reason that we have chosen to focus on the role of academic advising as an important mediating factor to investigate.

A crucial job for educators is to empower students with disabilities and to highlight their strengths and abilities by providing and disseminating opportunities (Hall & Belch, 2000). A sense of purpose in college is linked to hope, resiliency, achievement, and civic engagement for students with disabilities (Vaccaro et al., 2018), emphasizing the important role that faculty and advisors have in guiding students in this group to resources. Developing purpose is connected to educational and professional goal setting; staff and faculty should provide encouragement and guidance

to instill confidence in persistence (Mamiseishvili & Koch, 2011). To shift the burden of creating and pursuing goals from the students to the administration, academic advisors can utilize the minority group model and approach disability as an aspect of diversity, helping students find purpose and engagement that incorporate their abilities instead of focusing on the limitations created by their disabilities (Evans, et al., 2017). Furthermore, as explored below, academic advisors can play an important role in other areas of engagement such as student-faculty interaction and quality of interactions, with the ultimate goal of increasing support for students with disabilities.

### **Student-Faculty Interaction**

Positive interactions with faculty are important for promoting the engagement and success of students with disabilities as this group has higher interaction levels with faculty than students in the general population (Brown & Broido, 2015). It should be noted few students disclose to their university their disability status and, instead, are more likely to choose to identify directly to faculty (Newman & Madaus, 2015). Unfortunately, many faculty members lack sufficient knowledge about different disabilities, available accommodations, and even harbor bias toward disability (Cawthon & Cole, 2010). Additionally concerning is that students with disabilities have cited faculty disbelief of their disability as one of the greatest barriers they encounter (Aune, 2000). Researchers have found that, among this group, faculty have the most positive attitudes towards students with physical disabilities/mobility impairments, slightly less positive attitudes about students with learning disabilities, and negative attitudes about students with mental health disabilities; these negative opinions lead faculty to be uninclined to provide accommodations for learning and mental health disabilities because they equate accommodations with an unfair advantage for these students (Sniatecki et al., 2015). Furthermore, many faculty contradict themselves by expressing sensitivity to the needs of students with disabilities while being unaware of the services provided through the disability services office or the requirements for accommodations. Students with mental health disabilities have reported that after disclosure, faculty treat them differently, which directly impacts and lowers their engagement with other community members and resources on campus (Salzer, 2012). Even more concerning, Hartman-Hall and Haaga (2002) indicated that the response a student with a learning disability receives to their request for assistance or accommodation can impact subsequent help seeking behavior depending on the response.

A possible mitigating factor is the role of a professional who serves as a facilitator and empowers students with disabilities, particularly learning disabilities, to overcome challenges and make decisions (Reiff, 1997). Academic advisors are beneficially positioned to serve in this facilitating role, as they are often the first and most frequent professionals who interact with students with disabilities and may be the first to learn of their needs (Preece et al., 2007). With this information, and the knowledge faculty members often serve as advisors, it is necessary to consider academic advisors' role on this form of engagement for students with disabilities.

### **Quality of Interactions**

The quality of interactions that students with disabilities encounter with their peers, administration and campus staff also affects their engagement and outcomes. Social integration and participation in co-curricular activities and informal interactions with peers have a positive impact on quality of interactions, learning, and development for this population (Mamiseishvili & Koch, 2011). Meanwhile, positive interactions with faculty, academic advisors, and other staff are related to the empowerment of students with disabilities, their access to opportunities, and sense of purpose, as previously discussed (Hall & Belch, 2000; Vaccaro et al., 2018). However, like faculty, staff and administrators on campus are influenced by stigma related to disability, resulting in discouragement of students with disabilities from pursuing certain campus activities, majors, and career paths due to misconceptions about types of disabilities and available accommodations (Vaccaro et al., 2018). This dynamic is especially true for students with psychiatric disabilities (Kain et al., 2019). A common theme among interactions that students with disabilities have with these institutional agents is the responsibility to normalize or justify their disability to assimilate into majority culture, and this effort often discourages them from engaging in social activities (Hodges & Keller, 1999), in addition to feeling discouraged from pursuing otherwise beneficial opportunities (Vaccaro et al., 2018). This is undoubtedly related to the perception students with disabilities have of how supportive their environment is, as well as their level of overall engagement and positive outcomes. Although academic advisors cannot provide interventions to improve the quality of interactions students with disabilities have with their peers, they can play a role in the quality of interactions they and their colleagues have with those students. Furthermore, academic advisors can connect students with disabilities to opportunities for positive social engagement with peers by being aware

of options that exist on their campus and encouraging students to seek out those opportunities.

### **Academic Advising and Engagement**

Connecting with campus services encourages student engagement (Deacon et al., 2017); students with disabilities in particular achieve better outcomes when they are more engaged with the student environment (Murray et al., 2014; Vaccaro et al., 2018). In addition to titled academic advisors providing stand-alone utility in their defined roles, they often serve as connectors to other campus services (Preece et al., 2007; Rehfuss & Quillin, 2005). Therefore, formal academic advising benefits students with disabilities by engaging them directly and providing resources to other services. Abelman and Molina (2002) explored the connection between intrusive academic advising by official academic advisors and engagement for students with disabilities; Troiano et al. (2010) confirmed the connection between academic support services and positive educational outcomes. In a study of 33 academic advisors, Button et al. (2019) found specialized intervention was effective when supporting students with disabilities. Quantitative assessment of large survey data will indicate which advising behaviors are reaching college students with disabilities and the distinct ways these behaviors contribute to their overall college experience, and which are lacking and should be improved and developed to reach this population.

## **Research Considerations**

### **Anti-Deficit Framework**

Harper (2010) encourages using an anti-deficit framework to examine “institutional agents, policies, programs, and resources” that aid in student achievement and how students maximize their college experiences (p. 66). The use of this framework when studying students with disabilities provides researchers with an often-underused perspective; rather than focusing on personal barriers (Denhart, 2008), lower achievement or engagement (Deacon, et al., 2017; Rehfuss & Quillin, 2005), or the lack of disclosure and accommodation use (Hartman-Hall & Haaga, 2002; Newman & Madaus, 2015), attention can be given to avenues of success for students with disabilities. The interpretation of existing literature using an anti-deficit framework has contributed to the development of the current study, where the role of academic advising behaviors is explored to determine the influence these educators and their actions have on improving outcomes of students with disabilities. The current study contrasts with previous research, in

which scholars have compared students with disabilities to the rest of the campus population, contributing to a deficit narrative (Peña, 2014); instead, focus is given to people, resources, experiences, and opportunities fostering success.

### **Critical Quantitative Framework**

In the current study, the anti-deficit framework guided the first research question, the sample selection, and the implications for practice, while the critical quantitative framework guided the second research question and the choice to disaggregate the sample by type of disability. Critical quantitative research is rooted in the questions that are asked rather than the methods used to answer them, and researchers who employ this framework typically seek to question existing models, assumptions, and measures (Stage, 2007). Therefore, to achieve the goal of illuminating rather than marginalizing the experiences of students with disabilities, the research questions were crafted by challenging existing assumptions about this group as previously described (Vaccaro et al., 2015). Scholars have called for more critical quantitative research techniques including the disaggregation of this population, which is especially important when addressing concerns that educators treat students with disabilities as a homogenous group (Peña et al., 2016). Relevant data were selected to accommodate the research questions (Vaccaro et al., 2015); a topical module concerning academic advising behaviors was chosen in addition to NSSE data that allowed for the disaggregation of the population of students with disabilities into groups by disability type.

### **Data Sources and Sample**

Data from the 2015 and 2016 administrations of the National Survey of Student Engagement (NSSE) and the opt-in topical module on academic advising were used in the current study analysis (NSSE, 2019b). The NSSE is administered twice yearly to first-year students and seniors at four-year institutions with the goal of measuring engagement on their campuses as it relates to educational success (Kuh, 2001). NSSE data were used with permission from The Indiana University Center for Postsecondary Research. The current research project was funded by a grant from the National Academic Advising Association (NACADA).

In accordance with the theoretical frameworks for the current study, only first-year students from 312 four-year institutions who self-identified as having a disability were included in the sample (6,242) for comparisons to be made (see Table 1). Disaggrega-

**Table 1***Descriptive Statistics of Study Sample*

Model Variables	Overall Sample <i>n</i> =6,242		Learning Disability <i>n</i> =1,957		Mental Health Disorder <i>n</i> =1,487		Learning and Mental Health <i>n</i> =480	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Advisor behaviors								
Been available when needed (AD1)	2.92	0.01	2.93	0.02	2.95	0.03	2.80	0.05
Listened closely to your concerns and questions (AD2)	2.97	0.01	3.01	0.02	2.97	0.03	2.80	0.05
Informed you of important deadlines (AD3)	2.75	0.01	2.77	0.02	2.72	0.03	2.62	0.05
Helped you understand academic rules and policies (AD4)	2.71	0.01	2.76	0.02	2.65	0.03	2.63	0.05
Informed you of academic support options (tutoring, study groups, help with writing, etc.) (AD5)	2.70	0.01	2.78	0.02	2.58	0.03	2.61	0.05
Provided useful information about courses (AD6)	2.81	0.01	2.83	0.02	2.79	0.03	2.67	0.05
Helped you when you had academic difficulties (AD7)	2.60	0.02	2.69	0.03	2.53	0.03	2.44	0.06
Helped you get information on special opportunities (study abroad, internships, research projects, etc.) (AD8)	2.42	0.02	2.51	0.03	2.36	0.03	2.26	0.06
Discussed your career interests and post-graduation plans (AD9)	2.45	0.02	2.51	0.03	2.41	0.03	2.32	0.06
GPA								
Grades	5.74	0.02	5.51	0.04	5.92	0.05	5.40	0.09
Student-Faculty Interaction (SF)								
Talked about career plans with a faculty member (SF1)	2.24	0.01	2.28	0.02	2.18	0.02	2.24	0.04
Worked with a faculty member on activities other than coursework (committees, student groups, etc.) (SF2)	1.76	0.01	1.81	0.02	1.68	0.02	1.74	0.04
Discussed course topics, ideas, or concepts with a faculty member outside of class (SF3)	2.08	0.01	2.13	0.02	2.02	0.02	2.09	0.04
Discussed your academic performance with a faculty member (SF4)	2.23	0.01	2.33	0.02	2.13	0.02	2.26	0.04
Quality of Interactions (QI)								
Quality of interactions with students (QI1)	5.38	0.02	5.55	0.03	5.21	0.04	5.22	0.07
Quality of interactions with faculty (QI2)	5.35	0.02	5.42	0.03	5.28	0.04	5.32	0.07
Quality of interactions with student services staff (QI3)	5.03	0.02	5.07	0.04	4.99	0.05	5.00	0.08

(Table 1 Continued)

	Overall Sample <i>n</i> =6,242		Learning Disability <i>n</i> =1,957		Mental Health Disorder <i>n</i> =1,487		Learning and Mental Health <i>n</i> =480	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Quality of interactions with other administrative staff and offices (Q14)	4.93	0.02	5.00	0.04	4.81	0.05	5.00	0.08
Supportive Environment (SE)								
Providing support to help students succeed academically (SE1)	3.05	0.01	3.01	0.02	3.07	0.02	3.03	0.04
Using learning support services (tutoring services, writing center)(SE2)	3.13	0.01	3.10	0.02	3.15	0.02	3.11	0.04
Providing opportunities to be involved socially (SE3)	2.95	0.01	2.92	0.02	2.98	0.02	2.90	0.04
Providing support for your overall well-being (recreation, health care, counseling, etc.) (SE4)	2.94	0.01	2.94	0.02	2.92	0.03	2.97	0.04
Attending campus activities and events (performing arts, athletic events, etc.) (SE5)	2.83	0.01	2.84	0.02	2.84	0.02	2.84	0.04



tion by disability type was conducted to achieve this comparison; the sample includes 1,957 students with a learning disability (31.35%), 1,487 students with a mental health disorder (23.82%), and 480 students with both a learning disability and a mental health disorder (7.69%). The rest of the sample includes students with a sensory impairment, students with a mobility impairment, students with a disability or impairment not listed, and any students who selected two or more disability types, not including those who selected learning and mental health as co-occurring disabilities. Overall, the sample included mostly students who identified as a woman ( $n = 3,925$ ), white ( $n = 4,182$ ), non-first-generation ( $n = 3,923$ ), and full-time ( $n = 5,881$ ). Almost 60% of the sample attended public institutions and around 37% were enrolled at Doctoral Universities with the same proportion enrolled at Master's Colleges and Universities. The authors would like to express appreciation for those students who disclosed disabilities on the NSSE survey for the contribution they made to this and other postsecondary disability research.

### Measures

To create the sample for this study, disability status was determined using the NSSE item "Have you been diagnosed with a disability or impairment?" to which students could respond Yes, No, or I prefer not to respond (item description appendix available upon request). Only students who responded Yes were selected for the current study; those who responded No or I prefer not to respond were excluded from the analysis. To further disaggregate by disability type, a second disability item was used. The item asks students to select all disability or impairment types with which they are diagnosed and includes the following options: a sensory impairment (vision or hearing), a mobility impairment, a learning disability (e.g. ADHD, dyslexia), a mental health disorder, and a disability or impairment not listed above. It is important to note that this question is only available to students who respond Yes to the first disability item; those who respond No or I prefer not to respond are not provided this question. For the current study, three distinct disability measures were created from the largest subgroups: students who selected only a learning disability, students who selected only a mental health disorder, and students who selected a learning disability and a mental health disorder only (Learning and Mental Health). Last, it is uncommon to include ADHD with learning disabilities, however we were restricted to the formatting of this disability question as secondary data.

The Academic Advising Topical Module portion of the NSSE is an opt-in measure of students' experiences with academic advising selected to accompany the survey administration by the participating institution (NSSE, 2019b). Participants are asked questions regarding the quality of advisor interactions. For the purposes of this study, only the second question, which measures the quality of nine advisor behaviors respondents are asked, "During the current school year, to what extent have your academic advisors done the following?" and presented with nine items. Each item was measured using a 4-point Likert scale, with the option of answering Very much = 4, Quite a bit = 3, Some = 2, or Very little = 1; students were also able to select Not applicable and this response was re-coded as missing. Other items from this module were single measures of frequency of meetings and advisor outreach along with a broad question about who students have as a primary source of advising. Although these measures can be helpful for informing practice, their singularity in measurement precluded them from the reliability standards of the current study. Not included are questions about the advisor's role on campus (e.g., faculty or staff) or location of services (institution-wide, college specific, or within disability support services).

For the outcomes, to measure the academic performance (Grades), participants are asked "What have most of your grades been up to now at this institution?" This item was measured using an 8-point Likert scale, with C- or lower = 1 to A = 8. Scholars have warned that the use of self-reported grades should be done with caution (Kuncel et al., 2005); however, researchers investigating the validity of self-reported academic scores using NSSE data have found students' responses to be highly accurate (Cole & Gonyea, 2010). Three NSSE Engagement Indicators were used to measure engagement outcomes with slight alterations, compared to the recommended factors from the NSSE, to more succinctly align with the purposes of the current study. These indicators include: Student-Faculty Interaction (SF), Quality of Interactions (QI), and Supportive Environment (SE). To measure SF, students were asked, "During the current school year, how often have you done the following?" responding to four items: Talked about career plans with a faculty member (SF1), Worked with a faculty member on activities other than coursework (committees, student groups, etc.) (SF2), Discussed course topics, ideas, or concepts with a faculty member outside of class (SF3), and Discussed your academic performance with a faculty member (SF4). Each item was measured using a 4-point Likert scale, with options of answering Very often = 4, Often = 3, Sometimes = 2, or Never = 1.

For QI, students were asked to “Indicate the quality of your interactions with the following people at your institution” such as Students (QI1), Faculty (QI2), Student services staff (career services, student activities, housing, etc.) (QI3), and Other administrative staff and offices (registrar, financial aid, etc.) (QI4). Each item was measured using a 7-point Likert scale with the option of answering Excellent = 7 to Poor = 1. To mitigate collinearity, the traditional NSSE scale item measuring quality of interactions with academic advisors was not included. Similarly, using the previously cited scholarship on the experiences of students with disabilities, only five of the eight total items were used from the SE indicator to align with the purposes of the current study. For this outcome, respondents were asked, “How much does your institution emphasize the following?” for institutional characteristics such as Providing support to help students succeed academically (SE1), Using learning support services (tutoring services, writing center, etc.) (SE2), Providing opportunities to be involved socially (SE3), Providing support for your overall well-being (recreation, health care, counseling, etc.) (SE4), and Attending campus activities and events (performing arts, athletic events, etc.) (SE 5). Each item was measured using a 4-point Likert scale with the option of answering from Very much = 4 to Very little = 1.

### Analysis

For the current study, we employed correlation analysis, exploratory factor analysis, and structural equation modeling. The purpose of the correlation analysis was to evaluate possible issues of multicollinearity between the model variables, whereas exploratory factor analysis authenticated the clustering of advising measures into factors (factor table featured in appendix available upon request). The structural equation modeling allows us to answer our research questions by examining the relationships between these advising factors and study outcomes, while measuring the mediation path for students with distinct disabilities. A critical quantitative framework guided the selection of these three analyses, which enabled an investigation that avoided typical assumptions that all students with disabilities have similar lived experiences on campus. Furthermore, this analysis allows us to realize the goal of an anti-deficit framework, by mapping the pathways to success for these students (Harper, 2010).

To identify possible issues of multicollinearity between the mediator variables and dependent outcomes, the Pearson correlation coefficient was cal-

culated for each of these variables to be included in the final model (correlation table featured in appendix available upon request). Although many of these correlations were significant ( $p < 0.05$ ), the strength of relationships between the mediating and outcome variables was quite small ( $r < 0.31$ ) and posed no multicollinearity concern (Lomax & Hahs-Vaughn, 2012). This analysis was important to ensure the effects of the mediating variables were distinct from the outcomes; for example, it may be the case that a student’s academic advisor is faculty, so establishing that the measures related to SF were not strongly correlated with advising behaviors was crucial. Not surprising, the largest correlations existed between survey items within the same Engagement Indicator; for example, QI3 with QI4 ( $r = 0.67$ ) and SE3 with SE4 ( $r = 0.61$ ). However, these moderate correlations were acceptable since these items would ultimately be placed into the same latent variables.

Exploratory factor analysis was used to identify which items could be averaged together to create the latent variables of advising. Since the inter-factor correlations were substantial, the results of the oblique (promax) rotation were used to create models comparing the loading of two, three, four, and five factors. Only items with a factor loading value greater than or equal to 0.40 on a given factor were considered for consolidation. This process of simple loading achieved four factors, all with acceptable reliability measures (Cronbach’s alpha greater than 0.80).

To compare mediation for students with learning disabilities and mental health disorders, a Multiple Indicators Multiple Causes (MIMIC) model was employed with general latent variables in the structural equation model. First, the thirteen engagement measures were constructed into three latent variables. Second, four endogenous latent variables were built from the nine academic advising behavior items. Third, the four outcomes (grades, Student-Faculty Interaction, Quality of Interactions, and Supportive Environment) were regressed on the four academic advising factors. Finally, in three separate models, an indirect mediation relationship was added to measure if these advising factors could serve as significant ( $p < 0.05$ ) mediators for three distinct types of disabilities (learning disability, mental health disorder, and both a learning disability and mental health disorder) and the outcomes of the study. This modeling was performed using Mplus Version 8 and the Maximum Likelihood estimates to identify which errors could be correlated to improve model fit which, ultimately, met good fit standards proposed by Hu and Bentler (1999):  $p < 0.05$ , RMSEA  $< 0.05$ , and CFI & TLI  $> 0.95$ .

## Results

The standardized parameter estimates between academic advising latent variables and the outcomes were measured to answer the first research question, “How does academic advising behavior relate to grades and engagement among first-year students with disabilities?” (see Table 2). Meanwhile, the standardized direct and indirect effects for the outcomes for each disability type were calculated to answer the second research question, “For students with learning disabilities, students with mental health disabilities, and students with both a learning disability and mental health disability, how do aspects of academic advising significantly mediate these outcomes?” (see Table 3). Reported below are the results for both research questions by study outcome.

### Grades

For the overall sample of students with disabilities, the relationship between the academic advising behaviors both (1) Availability and Listening and (2) Obtaining and Discussing were moderately, positively related to the outcome of grades, whereas the behavior of Supporting, Providing, and Helping was strongly, inversely related to this outcome ( $R^2 = -0.41$ ). It is unlikely that this academic advising behavior is causing poor grades, but rather it may be that the students seeking out these behaviors from advisors already exhibit lower grades. It could also be the case that the advising was poor quality or the advisor provided general support, but that was not sufficient for the needs of a student with a disability, from these data the nature of the relationship is undetermined. Students with learning disabilities held moderate, inverse direct relationships with this outcome ( $R^2 = -0.18$ ); indicating that students with learning disabilities reported lower grades. Meanwhile, the behavior Supporting, Providing, and Helping served as a negative mediator, and Obtaining and Discussing for these students indicated that students with learning disabilities receiving increases in this behavior also held higher grades compared with other students with disabilities.

For students with a disability related to mental health, there was a positive, albeit small, direct relationship with grades ( $R^2 = 0.11$ ) compared with the reference group of students with other disabilities. For students with both learning and mental health disabilities, similar to those with a learning disability alone, there is a significant direct relationship with the outcome of grades ( $R^2 = -0.18$ ); however, Supporting, Providing, and Helping served as a positive mediator, while (1) Availability and Listening and (2) Obtaining and Discussing served as negative ones.

### Student-Faculty Interaction

For the overall sample of students with disabilities, there was a small, inverse relationship between the academic advising behavior Availability and Listening and Student-Faculty Interaction (SF) ( $R^2 = -0.08$ ). Meanwhile, the academic advising behavior Obtaining and Discussing was strongly, positively related to this outcome ( $R^2 = 0.60$ ). For students with a learning disability, there was a small, positive direct relationship with SF and a small, positive indirect relationship between this outcome and the academic advising behavior Obtaining and Discussing ( $R^2 = 0.06$ ), indicating that students with learning disabilities were more likely to interact with faculty compared to students with other disabilities; meanwhile, receiving invitations to educational opportunities or career advice from advisors increased these interactions.

For students with disabilities related to mental health, there was a small, inverse direct relationship with the SF outcome ( $R^2 = -0.12$ ; i.e., these students were less likely to interact with faculty); however, none of the academic advising behaviors served as significant mediators. For students with both a learning disability and mental health disability, there was not a significant direct relationship to SF. For these students, the academic advising behavior Obtaining and Discussing served as a small, inverse mediator for this outcome, indicating a complete mediation ( $R^2 = -0.09$ ). In other words, students with both disabilities were less likely to interact with faculty when advisors invited them to educational activities or discussed career plans.

### Quality of Interactions

For the overall population of students with disabilities, (1) Availability and Listening and (2) Supporting, Providing, and Helping had positive relationships with these students' Quality of Interactions (QI), although these effect sizes were small ( $R^2 = 0.10$ ) and large ( $R^2 = 0.38$ ), respectively. After disaggregating by type of disability, it was found that only students with mental health disorders held a direct relationship with this outcome and that these students were more likely to have lower QI ( $R^2 = -0.07$ ) than their peers with other types of disabilities. Supporting, Providing, and Helping, had a small, positive, indirect effect ( $R^2 = 0.04$ ) for students with learning disabilities, constituting a complete mediation. Indicating that students with learning disabilities who received help, information, and support from academic advisors reported higher quality of interactions with educators compared with other students with disabilities.

For students with mental health disorders, none of the four advising behavior factors succeeded in

**Table 2***Standardized Parameter Estimates Between Academic Advising Factors and Outcomes*

	Grades		Student-Faculty Interaction (SF)		Quality of Interactions (QI)		Supportive Environment (SE)	
	$R^2$	$p$	$R^2$	$p$	$R^2$	$p$	$R^2$	$p$
Academic Advising Behavior								
Availability and listening	0.19	0.00	-0.08	0.07	0.10	0.02	-0.02	0.61
Informing and understanding	0.04	0.59	0.01	0.93	-0.02	0.80	-0.03	0.70
Supporting, providing, and helping	-0.41	0.01	-0.13	0.36	0.38	0.01	0.47	0.00
Obtaining and discussing	0.28	0.00	0.60	0.00	-0.06	0.43	0.03	0.67

**Table 3***Standardized Indirect Effects via Academic Advising Factors and Direct Effects for Outcomes by Disability*

	Grades		Student-Faculty Interaction (SF)		Quality of Interactions (QI)		Supportive Environment (SE)	
	$R^2$	$p$	$R^2$	$p$	$R^2$	$p$	$R^2$	$p$
Learning disability								
Specific indirect								
Availability and listening	0.01	0.15	0.00	0.26	0.00	0.21	0.00	0.71
Informing and understanding	0.00	0.68	0.00	0.94	0.00	0.83	0.00	0.76
Supporting, providing, and helping	-0.04	0.06	-0.01	0.43	0.04	0.05	0.04	0.03
Obtaining and discussing	0.03	0.03	0.06	0.00	-0.01	0.46	0.00	0.67
Direct	-0.18	0.00	0.09	0.00	0.05	0.08	-0.08	0.00
Mental health disorder								
Specific indirect								
Availability and listening	0.00	0.72	0.00	0.75	0.00	0.73	0.00	0.87
Informing and understanding	0.00	0.65	0.00	0.95	0.00	0.82	0.00	0.77
Supporting, providing, and helping	0.04	0.09	0.01	0.43	-0.03	0.06	-0.04	0.05
Obtaining and discussing	-0.02	0.12	-0.04	0.08	0.00	0.51	0.00	0.72
Direct	0.11	0.00	-0.12	0.00	-0.07	0.03	0.07	0.02
Learning and mental health								
Specific indirect								
Availability and listening	-0.04	0.01	0.02	0.09	-0.02	0.07	0.00	0.70
Informing and understanding	-0.01	0.58	0.00	0.98	0.00	0.79	0.00	0.77
Supporting, providing, and helping	0.06	0.07	0.02	0.45	-0.06	0.06	-0.07	0.05

(Table 3 Continued)

	Grades		Student-Faculty Interaction (SF)		Quality of Interactions (QI)		Supportive Environment (SE)	
	$R^2$	$p$	$R^2$	$p$	$R^2$	$p$	$R^2$	$p$
Obtaining and discussing	-0.04	0.05	-0.09	0.02	0.01	0.47	-0.01	0.68
Direct	-0.18	0.00	0.07	0.20	0.01	0.84	0.05	0.28

**Table 4**

Summary of Significant<sup>a</sup> Direct Effects and Indirect Academic Advising Effects by Outcome, Disability Type

	Direct Effect	Availability and Listening	Supportive, providing, and helping	Obtaining and Discussing
<i>Grades</i>				
Learning disability	--			+
Mental health disorder	+			
Learning and mental health	--	-		-
<i>Student-Faculty Interaction (SF)</i>				
Learning disability	+			+
Mental health disorder	-			
Learning and mental health				-
<i>Quality of Interactions (QI)</i>				
Learning disability			+	
Mental health disorder	-			
Learning and mental health				
<i>Supportive Environment (SE)</i>				
Learning disability	-		+	
Mental health disorder	+		-	
Learning and mental health				

Note. <sup>a</sup> $p < 0.05$ . Note. Magnitude corresponds with number of signs, "--" indicates a moderate negative relationship.

significantly mediating engagement. For the students with both learning disabilities and mental health disorders, only Supporting, Providing, and Helping had a small, negative, indirect effect ( $R^2 = -0.06$ ) on QI—another complete mediation. Again, students with both disabilities reported that increases in these academic advising behaviors were related to lower engagement outcomes.

### Supportive Environment

For the overall sample of students with disabilities, the academic advising behavior of Supporting, Providing, and Helping held a large, positive relationship with the engagement outcome of Supportive Environment (SE) ( $R^2 = 0.47$ ). For students with both a learning disability and a disability related to mental health, the only significant relationship for SE was the negative mediating relationship of Supporting, Providing, and Helping, indicating a complete mediation for this group ( $R^2 = -0.07$ ). Students in both of these groups seeking help, information, and support from advisors reported lower levels of support in the overall campus environment.

### Limitations

Some limitations related to the data source and conceptualization of the results should be taken into account when considering the results of the current study. The population of students included in the analysis as “students with disabilities” was comprised of those individuals that disclosed a disability on the NSSE. It cannot be assumed that these students also disclosed their disabilities to their institutions or their academic advisors (Cole & Cawthon, 2015). This means that there was a possibility that some students in the sample had academic advisors that directed services toward them in the way they would for students without disabilities. Additionally, it is possible that some students that disclosed to their campus DSS office did not disclose on the NSSE and were therefore inadvertently excluded from the sample. The fact that the specific disabilities under study are “invisible” makes disclosure a more central complication.

The NSSE question regarding disability, “Have you been diagnosed with any disability or impairment?” is grounded in a medical model framework which, historically, by treating disability as a problem requiring a solution, “has negatively impacted the perception of individuals with disabilities” (Aquino, 2016, p. 318). The structure of this survey item may be a barrier to achieve accurate reporting; for example, students with mental health disorders often do not consider themselves as part of the disability

community and this broad term can vary widely from Schizophrenia to anxiety (Rehfuss & Quillin, 2005). Although the question was written guided by the medical model framework, we attempted to minimize this stigma through anti-deficit framing. Finally, the data source from the current study contains only institutions that opted in to include the Academic Advising Topical Module. This choice on behalf of survey administrators may indicate that institutions under study have a more vested interest in their academic advising than their peers that did not opt-in. It may be the case that this self-selection on behalf of institutions could influence the degree to which the trends in the current study can be generalized to all four-year institutions. Future research comparing the outcomes between opt-in and opt-out responses may provide interesting distinctions between these groups, but was beyond the scope of the current study. Lastly, this module does not allow us to determine the source of academic advising behaviors (faculty advisor, full-time academic advising staff, or other mentors), which can limit the applicability of these results. This secondary data analysis only allowed us to understand frequency of academic advising behaviors, not the quality, intensity, or effectiveness of these interventions.

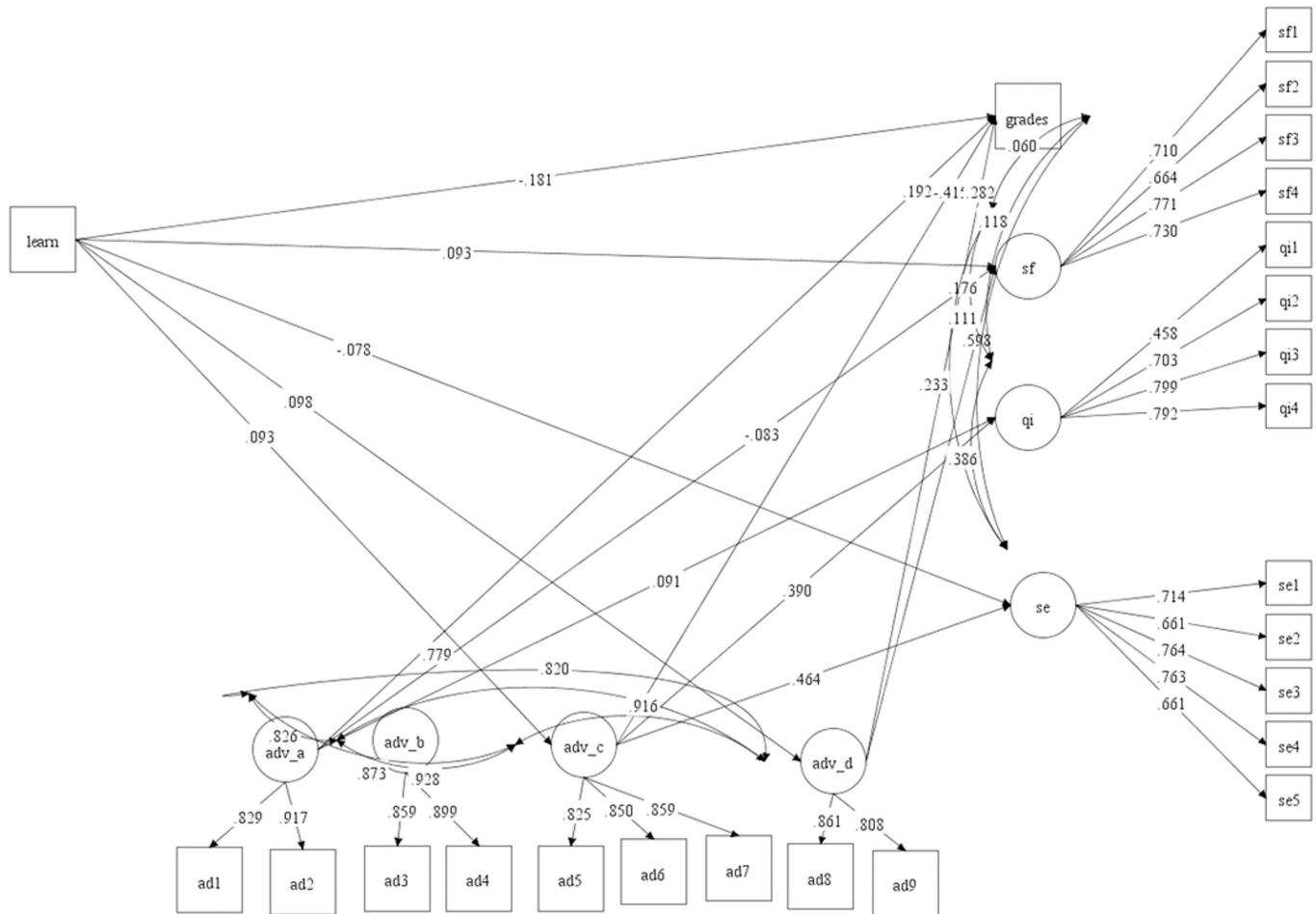
### Discussion

The results of the current study indicated that, for students with disabilities, there were consistent significant relationships between academic advising behaviors and the outcomes of grades and the three measures of engagement: Student-Faculty Interaction (SF), Quality of Interactions (QI), and Supportive Environment (SE) (see Table 4 and Figure 1). The sole exception was the Informing and Understanding advising behavior factor, which was not significantly related to these outcomes, nor did it serve as a significant mediator for any of the three disability groups: learning, mental health, or both learning and mental health. Broadly, for students with disabilities, the other advising behaviors were significantly related to grades and engagement.

The specific academic advisor behavior Supporting, Providing, and Helping related significantly with grades, QI, and SE; it is the only factor that related with SE. The measures for the Supporting, Providing, and Helping factor included: “Informed you of academic support options (tutoring, study groups, help with writing, etc.) [AD5]”, “Provided useful information about courses [AD6]”, and “Helped you when you had academic difficulties [AD7].” This finding from the current study complements prior scholarship. Abelman and Molina (2002) revealed that in-

**Figure 1**

*Standardized and Significant Effects of Structural Equation Model for Academic Advising Behaviors of First-Year Students with a Learning Disability (learn) with the Outcomes of Grades, Student-Faculty Interaction (SF), Quality of Interactions (QI), and Supportive Environment (SE). Mediating latent variables include Availability and Listening (adv\_a), Informing and Understanding (adv\_b), Supporting, Providing, and Helping (adv\_c), and Obtaining and Discussing (adv\_d).*



trusive academic advising was positively associated with GPA for students with disabilities. Considering this research, Supporting, Providing, and Helping is a more effective advising behavior than Informing and Understanding for this population. Showers and Kinsman (2017) explain that help-seeking behaviors for students with disabilities, which in turn lead to higher levels of support, predict better outcomes for those students.

The value of disaggregation within the population of students with disabilities is evident in this study; this aided in avoiding the trend of treating this population as a monolithic group or focusing solely on students with learning disabilities (Peña, 2014). Disaggregation has illuminated discriminant mediation patterns even among groups with co-occurring

disabilities; in other words, students with different types of disabilities may vary in the ways that advising behaviors are related to positive outcomes. For example, Supporting, Providing, and Helping was a significant mediator for all outcomes except SF for students with learning disabilities while only mediating SE for students with mental health disabilities. In the case of these two groups, even strong academic advising experiences may not be enough to mitigate limitations in faculty knowledge (Cawthon & Cole, 2010), understanding (Aune, 2000), or support for students with disabilities (Sniatecki et al., 2015). There were direct relationships between all outcomes and mental health disabilities, yet there was only a direct relationship between grades and disability type for students with both learning and mental health

disabilities. Plainly, students with different types of disabilities experienced advising behaviors distinctly. For instance, Supporting, Providing, and Helping was overall less helpful for students with mental health disabilities than it was for students with learning disabilities. These results can be used to challenge assumptions about the homogeneity of students with disabilities (Vaccaro et al., 2015), providing specific behaviors for academic advisors to use, acting as institutional agents in improving outcomes for students with distinct disabilities (Button et al., 2019).

### **Implications for Practice**

For each of the disability groups, academic advising behaviors related to Supporting, Providing, and Helping consistently serve as a significant mediator for the outcome of grades. This finding is not surprising, as one of the largest barriers to success for students with disabilities is lacking awareness of available academic supports on their campuses (Mamiseishvili & Koch, 2011). With students facing societal and familial pressure to pursue certain academic and professional paths, academic advisors should measure and contribute to students' success, connecting students to the courses and academic supports that allow them to enhance their strengths and improve upon their weaknesses (Vaccaro et al., 2018). Beyond in-person meetings, students with disabilities are increasingly accessing online courses and support services. Therefore, virtual support and assistive technologies may be an avenue for advisors to enhance Supporting, Providing, and Helping behaviors (DeLee, 2015).

Conversely, there was not a significant relationship between Informing and Understanding with outcomes for students with disabilities. Within this factor are the items "Informed you of important deadlines" and "Helped you understand academic rules and policies." If students with disabilities are having difficulties grasping concepts in their courses and lack the proper academic supports to complete their coursework, then knowing important deadlines and institutional policies may be irrelevant to their outcomes (Stein, 2013). Therefore, for institutions supporting this group, academic advisor behaviors on Informing and Understanding practices should not be emphasized as these behaviors do not provide significant support to students with disabilities.

Acting on our finding that students with distinct disabilities experience differential effects of academic advising, institutions can create curated advising interventions, and be mindful of the ways in which students with invisible disabilities may differ from their peers. Relatedly, institutions must invest more in faculty preparation to work with students with

disabilities, so they may take on a broader role in their engagement with these students. Intentionally designed training programs that include modules on student development and peer support are an effective pathway for advisor skill development (Ryser & Alden, 2005). New advisors have also reported that opportunities to shadow successful colleagues has strengthened their understanding of ways to support students with diverse needs (Mann, 2018). Additionally, advisors working with students with disabilities can improve their outcomes by developing collaborative relationships across campus; partnerships with disability services offices, faculty, counseling, financial aid, and other departments enable a more holistic advising experience and smoother delivery of services (Hemphill, 2002). These interventions can be especially impactful for students with invisible learning and mental disabilities, who may face challenges gaining acceptance and combating stigma on campus (Aune, 2000; Kain et al., 2019; Rehfuß & Quillin, 2005; Vaccaro et al., 2018).

### **Future Research**

The results of the current study contribute to existing literature on students with disabilities and academic advising. Further research on this topic would be useful to better understand the inverse relationships between advising behaviors and engagement outcomes for some disability groups. It may be that the engagement of these students is negatively affected by other factors and they therefore are more likely to seek out avenues of support. Qualitative analysis informed by the current study could be used to gain a more in depth understanding of this relationship. Another way to expand on this study would be to examine the effects of institutional context on the results; there may be differences based on institution size, type, and commitment to advising or disability; degree of training for advisors; and levels of collaboration between advising offices and DSS. For this secondary data analysis, most of this grouping information has not been collected and therefore could not be explored. Furthermore, the data used in this study do not indicate if any advisors are faculty members. Although the covariance matrix did not yield any concerning correlations between the advising items and SF, this is still worth exploring.

The current study provides a better understanding of how different academic advising behaviors can distinctly contribute to success for students with disabilities. By giving sole focus to this population rather than comparing this group to other students, the anti-deficit narrative of the current study contributes to existing literature. Furthermore, in the disaggrega-



tion of students with disabilities in the current study, we conducted within-group comparisons, giving attention not only to students with learning disabilities, but also students with mental health disabilities and students with both learning and mental health disabilities. As a result, this study provides evidence that academic advising behaviors have discriminant effects on outcomes for students based on disability type. Therefore, it is imperative that academic advisors understand the influence that advising has on the outcomes for students with disabilities; more importantly, given the distinctive experiences of students from different disability groups, advisors should be discerning when choosing their strategies for supporting these students.

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## Appendix A

### NSSE Core Survey: Disability Question Used in Analysis

*Have you been diagnosed with any disability or impairment?*

(No, Yes, I prefer not to respond)

*Which of the following have been diagnosed?*

(Selected = 1, Not selected = 0)

A sensory impairment (vision or hearing)

A mobility impairment

A learning disability (e.g., ADHD, dyslexia)

A mental health disorder

A disability or impairment not listed above

### NSSE Core Survey: Outcome Items Used in Analysis

#### Grades

*What have most of your grades been up to now at this institution?*

(A = 8, A- = 7, B+ = 6, B = 5, B- = 4, C+ = 3, C = 2, C- or lower = 1)

#### Student-Faculty Interaction (SF) ( $E\rho^2 = 0.809$ )

*During the current school year, how often have you done the following?*

(Very often = 4, Often = 3, Sometimes = 2, Never = 1)

Talked about career plans with a faculty member [SF1]

Worked with a faculty member on activities other than coursework (committees, student groups, etc.) [SF2]

Discussed course topics, ideas, or concepts with a faculty member outside of class [SF3]

Discussed your academic performance with a faculty member [SF4]

#### Quality of Interactions (QI) ( $E\rho^2 = 0.820$ )

*Indicate the quality of your interactions with the following people at your institution.*

(Excellent = 7, 6 = 6, 5 = 5, 4 = 4, 3 = 3, 2 = 2, Poor = 1, Not applicable = 9)

Students [QI1]

Faculty [QI2]

Student services staff (career services, student activities, housing, etc.) [QI3]

Other administrative staff and offices (registrar, financial aid, etc.) [QI4]

#### Supportive Environment Outcome (SE) ( $E\rho^2 = 0.838$ )

*How much does your institution emphasize the following?*

(4 = Very much, 3 = Quite a bit, 2 = Some, 1 = Very little)

Providing support to help students succeed academically [SE1]

Using learning support services (tutoring services, writing services, etc.) [SE2]

Providing opportunities to be involved socially [SE3]

Providing support for your overall well-being (recreation, health care, counseling, etc.) [SE4]

Attending campus activities and events (performing arts, athletic events, etc.) [SE5]

## Appendix B

### Academic Advising Behaviors Survey Items and Factors

*During the current school year, to what extent have your academic advisors done the following?*  
(4 = Very much, 3 = Quite a bit, 2 = Some, 1 = Very little)

Availability and Listening ( $E\rho^2 = 0.862$ )

Been available when needed [AD1]

Listened closely to your concerns and questions [AD2]

Informing and Understanding ( $E\rho^2 = 0.872$ )

Informed you of important deadlines [AD3]

Helped you understand academic rules and policies [AD4]

Supporting, Providing, and Helping ( $E\rho^2 = 0.890$ )

Informed you of academic support options (tutoring, study groups, help with writing, etc.) [AD5]

Provided useful information about courses [AD6]

Helped you when you had academic difficulties [AD7]

Obtaining and Discussing ( $E\rho^2 = 0.828$ )

Helped you get information on special opportunities (study abroad, internships, research projects, etc.) [AD8]

Discussed your career interests and post-graduation plans [AD9]



# Disability Awareness & Inclusive Teaching Online Training Videos for College Instructors Featuring Students with Disabilities

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## Abstract

Students with disabilities are a rapidly growing population in postsecondary education, estimated to be approximately 19.4% of undergraduate students (U.S. Department of Education, 2019). However, many postsecondary faculty members are unaware of the issues that students with disabilities experience and are not confident in how to teach diverse learners. While researchers have designed disability awareness and inclusive teaching trainings for postsecondary faculty, these trainings do not always include the voices of students with disabilities as the primary content. In this study, we demonstrate the importance of using student voice in postsecondary faculty disability awareness trainings. We highlight a mixed methods study that evaluates instructor perceptions of a Disability Awareness & Inclusive Teaching Video Training that uses student voice as its primary teaching tool.

*Keywords: disability awareness, postsecondary education, inclusive teaching, student voice, universal design of instruction*

Participation rates of students with disabilities in postsecondary education continue to increase. In the United States, approximately 1% of postsecondary students self-disclosed disabilities in 1987, 10% in 2003, and current estimates indicate that 19.4% of undergraduates report experiencing a disability (Wagner et al., 2005; U.S. Department of Education, 2019). Postsecondary students with disabilities encompass a group that possesses a range of diagnoses and experiences. Additionally, there are potentially many more students with disabilities on college and university campuses than only those who self-disclose disability (Newman & Madaus, 2015). Based on data from the National Longitudinal Transition Study-2 (NLTS2), Newman & Madaus (2015) found that only 35% of postsecondary students with disabilities self-disclosed their disabilities to their institutions, and even fewer, approximately 24%, received one or more accommodations in postsecondary education. As such, it is likely that the numbers of postsecondary students with disabilities in college classrooms exceed those who self-disclose and receive formal accommodations.

Despite the rapid growth of this population, students with disabilities do not achieve comparable academic outcomes to their peers without disabilities. These learners experience higher rates of course failure, and both lower retention and graduation rates than their peers without disabilities (Adams & Proctor, 2010; Hurst & Smerdon, 2000; Sanford et al., 2011; Wessel et al., 2009). Additionally, while almost 60% of young adults with disabilities attend college after high school, only one-third of these students graduate within six years (Newman et al., 2011).

Research has sought to identify factors that contribute to the academic performance of postsecondary students with disabilities. One consistent finding is faculty familiarity with and attitudes toward disability can affect students with disabilities' satisfaction with postsecondary education (Hartman-Hall & Hagga, 2002; Wilson et al., 2000). Wilson et al. (2000) found students with disabilities felt postsecondary faculty not only lacked knowledge about disabilities and related needs but also did not effectively teach and accommodate students with disabilities. Fleming et al.

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(2017) reported students with disabilities felt faculty expressed negative feelings toward them, including refusing to provide requested accommodations. Another study found that postsecondary students with disabilities felt patronized by faculty, and as a result, experienced lower self-esteem and negative learning experiences (Majoko, 2018).

A lack of disability awareness and inclusive teaching practices may be due to a lack of explicit instruction on these topics geared toward university faculty. Wilson et al. (2000) reported faculty expressed feeling unprepared to effectively work with students with disabilities. They reported not knowing where or how to access information and resources relating to students with disabilities; further, they desired a systematic way to gain knowledge and training about disability law, disability characteristics and general information, and teaching and academic success strategies (Wilson et al., 2000). Cook et al. (2009) surveyed faculty from an 8-campus university system in the Midwestern United States, seeking to ascertain their perceptions on the importance of student-related disability issues, as well as if and to what degree their institutions were addressing them. The researchers found that faculty noted the importance of accommodation policies, disability etiquette, disability law, universal design for instruction (UDI), and disability characteristics; however, out of these, the latter three were not satisfactorily addressed by their universities. This finding mirrors an earlier study by Salzberg et al. (2002), which also reported postsecondary faculty members do not receive training in UDI or instructional methods, generally. As university faculty typically possess content-area expertise and not necessarily pedagogical expertise, higher education institutions need to develop programs to address this knowledge gap.

### **Disability Awareness & Inclusive Teaching Training**

Researchers are beginning to explore the influence of disability-related training on faculty's attitudes toward and abilities to effectively serve students with disabilities. Rohland et al. (2003) found that after a 4-day disability-awareness training, faculty were able to share information regarding disability, related legal issues, and supports for students with disabilities with colleagues. Similarly, Sowers and Smith (2004) found that after a two-hour training about students with disabilities, faculty experienced improved perceptions toward and decreased concerns about working with this group. Murray et al., (2009) also showed that after participating in a disability-awareness training, faculty members were more willing to provide accommodations, and also

felt more confident in serving students with disabilities, as compared to those who did not participate in a training. Wynants and Dennis (2017) examined an online disability awareness training that presented information on disability and UDI and found that participants increased disability-related knowledge, attitudes, and confidence regarding teaching inclusively.

### **Universal Design for Instruction**

Universal design for instruction, or UDI, emerged from a universal design movement intended to design structures and products to be accessible for all individuals by providing multiple methods of use (Scott et al., 2003). It has since been applied to the field of education to create more inclusive and accessible instructional methods that maximize learning outcomes for the greatest number of learners, including those with disabilities (McGuire & Scott, 2006). The nine principles of UDI include (1) equitable use, (2) flexibility in use, (3) simple and intuitive, (4) perceptible information, (5) tolerance for error, (6) low physical effort, (7) size and space for approach and use, (8) a community of learners, and (9) instructional climate (Scott et al., 2003). Examples of these principles being used in instructional settings include providing students with class notes, providing grading rubrics, and using accessible materials, such as digital textbooks (see Scott et al., 2003 for more information and examples of each principle).

UDI is beneficial for instructors to implement because it incorporates adaptability, flexibility, and preemptive planning to ensure all aspects of a course are inclusive and responsive to students' needs (Scott et al., 2002). Students with and without disabilities in higher education stated that UDI supported their education because it allowed them to learn content based on their preferences (Black et al., 2015). Postsecondary disability service providers also noted the following strengths of UDI: "enhanced recruitment and retention of a diverse student body, provision of effective instruction to all students, empirical support for the scholarship of university teaching, and the reduction of stigmas associated with disabilities" (Embry et al., 2005, p. 41). Specifically, the UDI framework can be used to promote faculty teaching practices through multiple methods such as course syllabus design, course mapping, and assessment (Lombardi et al., 2018).

### **Student Voice**

Disability awareness & inclusive teaching trainings may be a promising tool to inform understanding and shift perceptions of disability in postsecondary education. While these trainings cover a range of



subjects, including disability characteristics, accommodations, inclusive teaching, disability laws, and campus resources (Carballo et al., 2021; Cook et al., 2006; Murray et al., 2009; Rohland et al., 2003; Sowers & Smith, 2004; Wyants & Dennis, 2017), some also feature panels of students with disabilities. Featuring students with disabilities in disability awareness and inclusive teaching trainings enables these learners to construct the narrative about what it means to experience disability in postsecondary education. Further, students with disabilities can offer valuable feedback regarding how to make postsecondary education accessible. Aquino (2016) suggests, “To better understand students with disabilities and the potential stigma and exclusion they may face, it is vital to learn first-hand accounts of what they may endure” (p. 318). As such, there is a need to examine disability awareness and inclusive teaching training that uses student voice, or the voices of students with disabilities, as the primary teaching tool.

### The Current Study

With funding support from her institution’s Center for Excellence in Teaching and Learning, the lead author of this study created the *Disability Awareness and Inclusive Teaching Online Video Training* for postsecondary instructors. The training consists of five videos, one each on ADHD, autism spectrum disorders, anxiety and depression, and traumatic brain injuries, including concussions. These disabilities were selected at the advice of the Center for Teaching and Learning, as they are common disabilities about which faculty inquire. The fifth video introduced the concept of UDI and provided tools, including a course mapping worksheet, an inclusive instruction checklist, and inclusive syllabus checklist, to enact these principles (Lombardi et al., 2018).

Each video presented definitions of the disabilities, described typical symptoms of each, and how they may manifest in a learning environment. The primary component of the videos included excerpts from interviews with postsecondary students with disabilities, who described their experiences with disability, especially when learning. The student narratives complemented the objective information and allowed students to inform how professors understood the experiences of students with disabilities. The videos also included short interviews with disability-related professionals, such as psychologists and speech language pathologists. To intentionally model the principles of UDI to faculty, information was presented in various ways, including both auditorily and visually, as well as having concepts explained by different parties. Each video concluded

with a summary chart that outlined common disability symptoms, potential ways symptoms may manifest when learning, and inclusive teaching strategies that may assist students experiencing each. Videos were captioned throughout. A link to a worksheet outlining the same information was also included. To make the videos easily accessible to instructors, each spanned between 16-28 minutes, could be paused and returned to, and viewers could take as long as they needed to watch them. The training was made available on the institution’s learning management system.

The current study sought to determine how completing the training influenced postsecondary instructors’ awareness of disability and inclusive teaching practices. A second aim included receiving feedback from instructors on what aspects of the training were most and least useful. As such, the study examined the following research questions:

### Research Questions

1. How did completing the *Disability Awareness & Inclusive Teaching Online Video Training* influence instructors’ disability-related self-efficacy?
2. Were there differences between disability-related self-efficacy scores among instructors based on number of years taught and faculty rank?
3. How did completing the *Disability Awareness & Inclusive Teaching Online Video Training* influence instructors’ teaching methods?
4. What aspects of the *Disability Awareness & Inclusive Teaching Online Video Training* were most helpful to instructors?
5. What changes to the *Disability Awareness & Inclusive Teaching Online Video Training* would instructors recommend?

### Methods

#### Study Design

We used a convergent mixed method research design (Creswell, 2015) to determine how participating in the *Disability Awareness & Inclusive Teaching Online Video Training* affected participants’ disability-related self-efficacy and teaching methods. Disability-related self-efficacy encompasses general disability knowledge, familiarity with disability-related supports and principles of UDI and feeling prepared to share this information with colleagues (Murray et al., 2014). The quantitative portion of this study measured disability-related self-efficacy scores before and after participants accessed and completed the training. Originally, the research team planned

to invite study participants to attend a focus group to share their perceptions of the training and how it may or may not have affected their teaching. However, due to the COVID-19 pandemic, the focus group was cancelled. Instead, the four qualitative questions, listed in the Appendix, were included in a Qualtrics survey link that was emailed to participants after they completed the training. These additional questions enabled participants to describe their experiences participating in the training and how it may or may not have influenced them as educators; the qualitative questions also asked participants to provide feedback on what components of the training were most and least effective. Data from the quantitative analysis and the first two qualitative questions were integrated complementarily in order to “provide a better understanding of the research problem than either form of data alone,” (Creswell, 2015, p. 2). Data from the second two qualitative questions were analyzed to improve future iterations of the training tool.

### Procedures

After Institutional Research Board Exempt Approval was received at the authors’ institution, they collaborated with the university’s Center for Excellence in Teaching & Learning to recruit instructors to participate in the training. Recruitment began in spring 2019 and continued through summer 2020 with study recruitment information posted in the university-wide daily faculty emails. Information was also sent directly to department chairs requesting that it be shared with faculty during departmental meetings.

### Participants

Signed informed consent was received from 120 participants and one hundred of those participants completed the training within the study timeframe (83%). Of the 100 participants, 52% ( $n=52$ ) were faculty members and 46% ( $n=46$ ) were graduate assistants. Instructors in the College of Liberal Arts made up the largest portion of participants with 50% ( $n=50$ ). The second most represented was the School of Education with 22% ( $n=22$ ) of respondents. Eleven percent ( $n=11$ ) of participants were from the School of Engineering, 5% ( $n=5$ ) from the School of Agriculture, 4% ( $n=4$ ) from the School of Medicine, and 2% or less from the remaining colleges. The majority of participants identified as female (82%,  $n=82$ ) and White (83%,  $n=83$ ). Of instructors at the institution, about 38% are females, with our study having a larger portion of females than the sample population. A comparison of race and ethnicity representation in the training and the overall representation for the sample institution can be viewed in Table 1. Our survey in-

cluded an overrepresentation of White faculty and an under representation of faculty of color.

### Data Collection

To participate in the evaluation of the video training, faculty members were required to review and sign a consent form describing the purpose of the study. After providing consent, participants were given access to the training on the institution’s learning management system. Before and after watching the videos, they were prompted to complete a pre-test, the *Disability-Related Self-Efficacy Scale*, which was previously developed and validated to measure disability-related self-efficacy in the context of in-person faculty training that was similar in content (Murray et al., 2014). Participants rated their level of confidence with given statements on a scale from 1 (*no confidence at all*) to 5 (*complete confidence*). The measure includes four subscales: Knowledge of Services (3 items), Sharing Information (3 items), Universal Design (4 items), and Knowledge of Disability (8 items). To assess the reliability of the measure, Cronbach’s alpha was computed at the subscale level as it is the most widely used reliability measure (Aron et al., 2013). Table 3 shows alpha values at both time points on the current sample. Reliability on the current sample is reported in Table 3 and in the Results (p.15)

### Data Analysis

#### *Quantitative Measures*

We examined the influence of the disability-awareness training on faculty member’s awareness of and familiarity with student disability issues by conducting four multiple regression models for each of the disability-related self-efficacy outcomes. A difference score was computed based on subtracting pre-test score from post-test score by subscale. The difference scores were regressed on the predictors of years teaching, graduate assistant status and tenure status. Participants’ years teaching was rounded up (e.g., if a participant stated 4.5 years, their answer was input as 5 years). Graduate assistant status was identified as participants who responded that they were a “graduate student teaching assistant” for the question of “Rank” and tenure status was identified as participants who responded that they were “full professor,” “assistant professor,” or “associate professor” on the disability-related self-efficacy measure.

#### *Qualitative Measures*

Participants were asked four open-ended questions (Appendix), that provided them with an opportunity to describe what components of the training they found most and least helpful and how complet-

**Table 1***Race/Ethnicity Representation in Training and Overall Institution (n=100)*

	Participants	Institution
White	83%	77%
Asian	9%	15%
Black/African American	1%	6%
Hispanic/Latino	7%	4%
Multiple Races	6%	Not reported

**Table 2***Results of the Regression Models of Change Scores Across Subscales*

Predictor	Change in Knowledge of Services		Change in Knowledge of Disability		Change in Knowledge of Universal Design		Change in Knowledge of Sharing Information	
	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$
Intercept		4.850*		5.083*		5.873*		5.652*
Years Teaching	.025	.277	.105	.924	.043	.367	.067	.592
Graduate Assistants	.365	2.799*	.306	2.278*	.143	1.022	.270	2.014*
Tenured Faculty	.035	.280	.107	.827	.073	.546	.018	.136

*Note.* \* $p < .001$ **Table 3***Pre-Score and Post-Score Alpha, Mean, and Standard Deviation for Each Factor*

	Pre-Scores			Post-Scores		
	$\alpha$	$M$	$SD$	$\alpha$	$M$	$SD$
Knowledge of Services	.704	2.7050	.77845	.807	3.9483	.74675
Knowledge of Disability	.905	2.7399	.72507	.893	3.8900	.55534
Universal Design	.861	2.5846	.90788	.850	4.2138	.64508
Sharing Information	.807	2.4317	.87844	.809	4.0600	.70652

ing it may or may not affect their teaching; they were also able to share any additional feedback. This study used a basic qualitative design, as outlined by Merriam & Tisdell (2016), to analyze and identify themes in participants' qualitative survey responses. Analysis involved "identifying recurring patterns that characterize the data," (Merriam & Tisdell, 2016, p. 25). As such, the "primary goal of a basic qualitative study is to uncover and interpret" (Merriam & Tisdell, 2016, p. 25) meaning in participants' responses.

Responses to the qualitative survey questions were exported from Qualtrics to a Microsoft Word document. To begin the analysis, the first and third authors independently read and reread the data, recording initial responses to it in separate memos. Next, each author began open coding the data or "identifying segments," that were "responsive to (the) research questions," (Merriam & Tisdell, 2016, p. 203). Each segment, or code, encompassed "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data," (Saldana, 2013, p. 24). To stay "within the data," (Grbich, 2013, p. 83) and close to the participants works, the authors used in-vivo coding, or creating codes using participants' words whenever possible. Coding continued until saturation was reached, or "no new information, insights, or understandings" emerged from the data. The authors compared codes and resolved any discrepancies.

Next, the authors individually reviewed codes to identify patterns, similarities and connections between codes, and subsequently grouped them into categories. Merriam and Tisdell (2016) describe categories as "conceptual elements that 'cover' or span many individual examples (orbits or units of the data you previously identified)" and that they should "capture some recurring pattern that cuts across your data" (p. 206). Once categories were established, each author returned to the initial codes to determine if they supported the categories. In the final step of analysis, the authors reflected on the categories and identified overarching themes that were present throughout the data; a theme, as the result of coding/categorization, captures abstract concepts, analytic patterns (Merriam & Tisdell 2016), and "meaning within the data set," (Braun & Clarke, 2006, p. 261). Each author intentionally named and remained aware of her biases throughout the analysis to ensure she did not project them onto the findings. These authors also included positionality statements in the manuscript.

### Positionality Statements

The authors who conducted the qualitative analysis were cognizant of their experiences and how

they could impact their results. Both researchers have worked in postsecondary settings supporting students with disabilities and are currently active in an undergraduate student group focused on disability. The two researchers also both identify as students with disabilities. In order to minimize any bias that may occur, the researchers remained aware of their positions how they could affect them and applied methods to establish credibility throughout the research process.

### Credibility

In qualitative research, credibility refers to increasing "the correspondence between research and the real world," (Wolcott, 2005, p. 160). In this study, the authors used investigator triangulation, stated their positionality, and clearly described their research process, or audit trail, to establish credibility. Investigator triangulation involves multiple investigators independently "collecting and analyzing data," and "compar(ing) their findings" (Merriam & Tisdell, 2016, p. 245). In addition to remaining aware of their biases throughout the analysis, the authors also included positionality statements, to "allow the reader to better understand how the individual researcher might have arrived at their particular interpretation of the data" (Merriam & Tisdell, 2016, p. 249). Finally, the authors provided an audit trail, which clarified how the data were collected, coded, categorized, and developed into themes, enabling readers to understand each process. Coding trees illustrating how themes were developed from codes are also included in Figures 1-3.

## Results

### Quantitative

**RQ1:** How did completing the Disability Awareness & Inclusive Teaching Online Video Training influence instructors' disability-related self-efficacy?

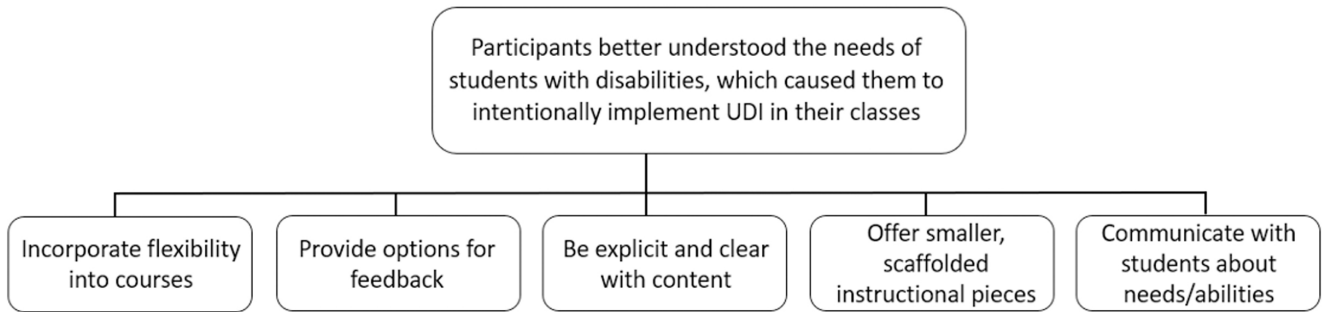
Table 3 shows the mean scores across subscales. Results show trend level changes from pretest to posttest illustrating a change in disability-related self-efficacy that suggests the training videos were a positive influence for those faculty who participated in the training. In all cases these changes were more than one point on a five-point scale.

**RQ2:** Were there differences between disability-related self-efficacy scores among instructors based on number of years taught and faculty rank?

The predictors of graduate assistant status, tenure status and years teaching explained approximately 11% of the total variance. Graduate assistant status explained significant unique variance ( $\beta = .365$ ,  $t = 2.799$ ,  $p = .006$ ). Though the overall models for the subscale of Knowledge of Disability, Universal De-

**Figure 1**

*Coding Trees Illustrating Research Question 3 Theme Development*



**Figure 2**

*Coding Trees Illustrating Research Question 4 Theme Development*

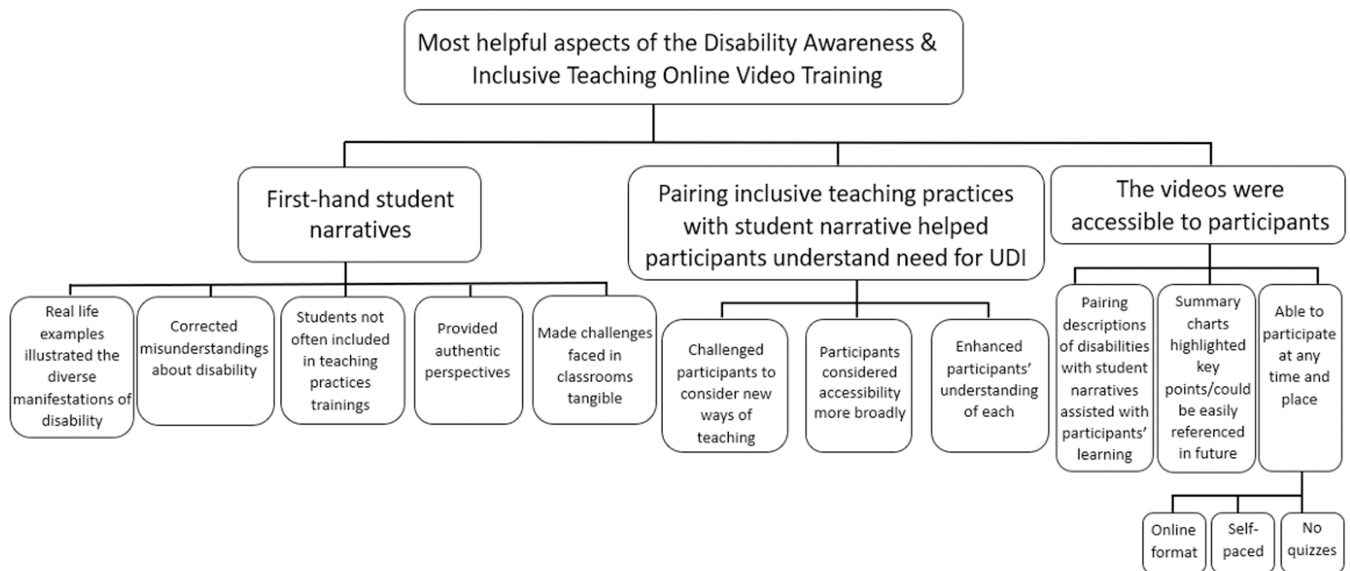
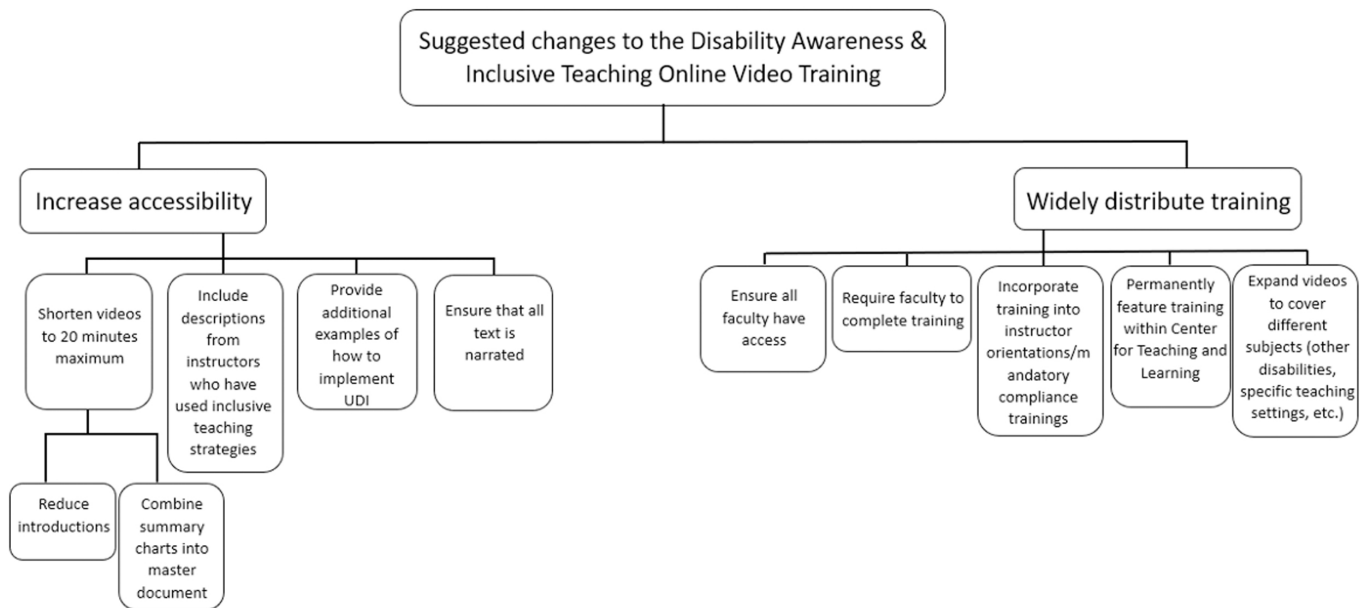


Figure 3

Coding Trees Illustrating Research Question 5 Theme Development



sign and Sharing Information were not significant, there was a trend level change from pre- to post-test scores across these subscales. The predictor of graduate assistant status was also significant in the models of Knowledge of Disability and Sharing Information though the overall models were not significant. Overall, faculty self-reported greater disability-related self-efficacy after completing the training, and there was some variation with regard to faculty rank. Specifically, graduate assistants reported greater change scores suggesting this group gained the most from the training experience. Further details for all predictors can be viewed in Table 2.

Cronbach's alpha was computed for the items from the disability-related self-efficacy scale to determine the reliability (see Table 3). Reliability results for the current sample can be found on p. 11 and 14. All subscales were within adequate range with alphas between .704 and .905, as a score of .60 signifies the minimum sufficient Cronbach's alpha score, though a score closer to .90 is preferred (Aron et al., 2013). The subscales of Knowledge of Disability and Universal Design had the highest reliability between .850 and .905, while the Knowledge of Services and Sharing Information subscales had slightly lower alphas between .704 and .809. Means and standard deviations for subscale pre- and post-scores are also provided in Table 3.

### Qualitative

**RQ3:** How did completing the Disability Awareness & Inclusive Teaching Online Video Training influence instructors' teaching methods?

Participants' responses revealed that viewing the training helped them to better understand the needs of students with disabilities, and ultimately, influenced them to intentionally implement UDI in their classes if they have not done so previously – or to maximize ways that they were already applying these principles. The most frequently mentioned change, incorporating flexibility into courses, involved creating options for assignments and assessments, deadlines, and methods of participation. One participant described the changes she made:

I've worked to make my activities more multi-modal to accommodate different abilities. I am also planning more flexible end-of-term projects that can be completed in a number of different ways, so that students can apply the knowledge in whatever way suits them the best.

Another participant commented on how she adapted how she sought feedback from students.

I have stopped asking students to raise their hand if they did not understand something. Once I

watched the video on anxiety, I realized how horrible that was! Now I ask my students to smile if they want me to repeat something. This makes everyone smile and so I just go over the confusing bits again.

Participants also stated that the videos reminded them to be explicit and clear with not only class content, but deadlines and descriptions of assignments as well. Specific changes included using “take home” slides that emphasize key points, slowing down and repeating instructions, especially in lab settings, and providing detailed syllabi and class materials, and reminders for long-term assignments. One participant detailed how inclusive instruction may affect students learning in her lab:

I think labs could work better if we offered smaller instructional pieces, allowed students to do that part of the lab, pause for more instruction, etc. This would allow students to put the pieces they learned into effect right away and help students who have trouble retaining that information.

A final area of change that participants described involved communicating with students, especially about their accessibility needs. Several participants shared that as the videos illustrated the diversity of students and their abilities, they also emphasized the need to learn about students and how to best enable their learning. Summarizing this, one participant said, “There are no one size fits all and especially at a college level, it is critical to be accommodating in a multitude of ways.” Participants also communicated that in addition to learning about specific disabilities, they also had better understandings of why students may be hesitant to self-disclose and the purpose of reasonable accommodations.

**RQ4:** What aspects of the Disability Awareness & Inclusive Teaching Online Video Training were most helpful to instructors?

The qualitative analysis revealed three themes relating to this research question; instructors stated that most helpful aspects of the training were hearing first-hand narratives of disability from students, receiving information regarding specific inclusive teaching practices, and the videos’ ease of access. Participants most frequently described being impacted by student narratives, which was mentioned by 34 out of 47 participants who responded to the qualitative survey. They described that the hearing “real life examples” from students with disabilities illustrated the diverse ways disability can manifest in the classroom, and corrected misunderstandings instructors

had about disability. Additionally, several participants noted that students themselves are not often included in trainings about best teaching practices. One participant noted, “I really liked hearing from students who had disabilities themselves. I feel as though that happens less in other trainings. But it gives some real perspective from people who are actively living and learning with these disabilities.” Another stated that “the excerpts from students really made tangible the challenges they face in classrooms that aren’t universally designed.”

A second theme related to student voice was participants reported better understanding of UDI as well as the need for accessible classrooms. One participant explained, “the anecdotes challenged me to think about aspects of my teaching in new ways and consider accessibility much more broadly than I had previously.” Others described how combining information about disability awareness and inclusive teaching enhanced their understanding of each. Illustrating this, one participant said:

The Universal Design of Instruction framework was most helpful. After learning about the various challenges that those with disabilities might face, this framework helped to conceptualize concrete ways of structuring the course to be most accommodating.

Participants also appreciated receiving specific practices to implement these principles to make their teaching more accessible. They described, “learning new strategies to help all students learn in my courses,” receiving “very specific guidelines to inspire practices,” and “liking the specific information about how instructors can be more inclusive.”

A third theme involved the accessibility of the videos themselves. Participants shared that the videos’ organization and supplemental materials allowed them to easily absorb the information and will enable them to apply it to their future teaching. Specifically, participants indicated that following the objective descriptions of disabilities and their typical symptoms, which were based on descriptions from the Center for Disease Control, American Psychological Association, and the American Speech-Language-Hearing Association, with narrative accounts from students who experience them enhanced their understanding of different disabilities. Other participants commented that the summary charts at the end of each video highlighted key points and could be easily referenced for future use. One participant stated, “I found the handouts the most helpful, particularly the grids that explained the obstacles students face, how this manifest, what in-

structors can do to help. I saved all of these to my computer for future reference charts that I could look back at to guide me.” In addition to the organizational structure, participants appreciated that the videos were online, self-paced and did not include quizzes.

**RQ5:** What changes to the Disability Awareness & Inclusive Teaching Online Video Training would instructors recommend?

While 98%, or all but one, of the qualitative survey respondents indicated that the videos improved their disability awareness and knowledge of inclusive teaching, participants also shared ways to improve the videos. This feedback encompassed two themes: increase ease of access and widely distribute the video training. The first theme included making the videos shorter, providing additional examples of how to implement UDI, and ensuring that all text is narrated. Several participants suggested that each video should not span more than 20 minutes. Recommended ways to shorten the videos included reducing the introductory information (e.g., reenactments of students’ accounts) and combining the summary charts at the end of each video into a “master” document as many of the inclusive teaching strategies overlapped.

Participants also stated that the videos could have included descriptions from instructors who have used inclusive teaching strategies. One participant described, “It might have been helpful to have a video of an actual teacher talking about how they adapted to a student in their class. They could address what worked and what did not work.” Incorporating more examples, as well as non-examples, of inclusive course materials and teaching strategies was recommended. A third aspect of the theme “Increase Ease of Access” involved ensuring that all text in the videos was also verbally narrated.

The second theme involved ensuring all faculty have access and be required to complete disability awareness and inclusive teaching training. Participants recognized that instructors from different fields may receive various levels of training regarding teaching practices, and many more may not be aware of the issues students with disabilities experience. As such, participants proposed a range of ways to expose postsecondary instructors to this information, including incorporating this type of training into faculty and teaching assistant orientations, mandatory compliance trainings, and permanently featuring disability awareness and inclusive teaching resources within centers for teaching and learning. Another recommendation included continually creating videos on different subjects, such as other disability types, how to apply inclusive teaching in small versus large classes, and in lab settings.

## Discussion

The findings of this study suggest that the *Disability Awareness and Inclusive Teaching Online Video Training* featuring students with disabilities had positively influenced postsecondary instructors’ disability-related self-efficacy and influenced their use of UDI principles when teaching. Our findings were similar to those found in other studies that examined how disability awareness and/or inclusive teaching trainings influenced faculty members’ perceptions and understandings of disability, accommodations, and related laws, and confidence in serving students with disabilities (Hromalik et al., 2020; Hsiao et al., 2019; Stevens et al., 2018). While the training under investigation in the current study included many similar features to other disability awareness and inclusive teaching trainings, it used the voices of students with disabilities as the primary teaching tool. Trend level increases from pretest to posttest scores provide promising feedback on the *Disability Awareness & Inclusive Teaching Online Video Training*. Among all participants, each subscale had at least a 1-point increase in the mean score between the pre- and post-scores indicating participants felt more “confident” in items on the disability-related self-efficacy scale after completing the training. Further, significant variance was explained for graduate student instructors in three of the four subscales, which were Knowledge of Services, Knowledge of Disability, and Sharing Information. These findings indicate the training was particularly informative for novice instructors. Further, 72% of respondents to the qualitative survey indicated that these narratives were the most impactful aspect of the training and helped them to understand not only disability, but the need for UDI in college classrooms. Featuring students with disabilities in disability awareness and inclusive teaching trainings enables these learners to create the narrative about what it means to experience disability in postsecondary education, to highlight the ways postsecondary education is still inaccessible (Dolmage, 2017), and to inform how institutions and instructors can make these settings more inclusive.

Previous research shows the greatest barrier to faculty completing disability awareness and inclusive teaching training was staff resources and faculty time (Raue & Lewis, 2011). This project assessed an online training that did not require additional resources after creation, and faculty could take any period of time to view it and could do so from any location. Participants reported appreciating the online, self-paced format, and also the supplemental summary materials that could be easily referenced later. Future trainings may benefit from using similar features.



Feedback from participants regarding how to improve the training presented a contradiction: participants recommended both shortening the length of the videos, but also including more information, such as covering more disabilities or different educational settings. One potential way to fulfill both suggestions would be to develop a series of shorter videos that focus on individual disabilities, presenting only information about each disability and narratives from students who experience them. Other videos in the series could focus exclusively on inclusive teaching strategies and methods. Creating video series with a greater range of short videos would allow instructors to select pertinent videos as they required or had time for them, which could potentially increase the number of instructors who could access the content. Regardless of the video format, all training materials should ensure accessibility by including narration of all text and closed captions for all auditory communication.

### Limitations

Though the findings of this study are promising, some limitations need to be addressed. This pilot study was underpowered and therefore generalizability is limited. We did not have a comparison group of faculty, which would have allowed us to more rigorously test the effects of the training. Limitations involving the quantitative analysis were also due to an underpowered study. The sample of participants in the study was highly skewed with 83% female, which differs greatly from the overall faculty population of 38% female. The racial distribution of participants was also mostly White with very few participants who identified as faculty of color. The largest discrepancy appeared for Black/African American participants with only 1% of the sample identifying as Black/African American compared to the 6% of the general population. The qualitative results were collected via internet survey instead of through in-person focus groups due to COVID-19 restrictions, which may have impacted the quality of answers obtained since participants could not be asked to elaborate on their answers. Further, a limitation involving the qualitative analysis includes that only researcher triangulation was used, and not other forms of triangulation.

### Implications for Practice

This study extends the research literature by demonstrating that disability awareness and inclusive teaching training may increase instructors' awareness of disability and knowledge and use of inclusive teaching practices. However, this work did not examine whose role it is to provide such training. While the authors of this study collaborated with their insti-

tution's Center for Excellence in Teaching and Learning to promote the *Disability Awareness & Inclusive Teaching Online Video Training*, offices that facilitate equity and diversity trainings may also be positioned to fill this role. Bezrukova et al. (2012) define diversity training as "a distinct set of programs aimed at facilitating positive intergroup interactions, reducing prejudice and discrimination, and enhancing the skills, knowledge, and motivation of people to interact with diverse others" (p. 207). While students with disabilities constitute one of the largest minority groups on college campuses, disability is often not featured as an aspect of student diversity and diversity faculty trainings (Davis, 2011). Similarly, research suggests faculty may not consider disability as a component of diversity (Barnard et al., 2008). Including disability awareness as a component of diversity training may ensure the greatest number of faculty are exposed to disability-related information.

### Future Research

Additional research will be critical to scale-up and more rigorously test the faculty training in order to confirm the findings. First, future research should be conducted with a larger and more diverse sample. As described in the previous section, there may be a need to create additional disability awareness and inclusive teaching online videos, such as shorter versions covering other disabilities and specific assessment of inclusive teaching strategies. As the central feature of this training was students with disabilities, future research may also compare the effects of disability awareness and inclusive teaching trainings with and without these voices to determine how this inclusion may affect instructors. Other instructor characteristics, beyond years teaching, graduate assistant status and tenure status, could also be examined in future studies.

Additionally, the video training was evaluated based on the perspectives of the instructors watching them. It may be valuable to seek student feedback, especially from those with disabilities, regarding how their instructors' teaching may or may not have changed before after instructors complete this type of training.

A final area of potential future research includes creating and evaluating disability awareness and inclusive practices trainings on student affairs professionals. Trainings, similar to those in the current study, could be developed that use student voices as the primary teaching tool; however, the inclusive teaching consent could be adapted to reflect how student affairs professionals can incorporate accessibility and inclusive practices into their work.

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# **Appendix**

## **Qualitative Survey Questions**

1. What components of the Disability Awareness & Inclusive Teaching online video training did you find the most helpful and why?
2. What components of the Disability Awareness & Inclusive Teaching online video training did you find the least helpful and why?
3. How did, if at all, the Disability Awareness & Inclusive Teaching online video training inform your teaching practices? In other words, will you be making any changes to your courses as a result of participating in this training?
4. Do you have any other feedback regarding the Disability Awareness & Inclusive Teaching online video training?



# A Case Study on Flexible Design: Eliminating Documentation Requirements for Academic Adjustments on a Test (Practice Brief)

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Valerie M. Wood<sup>1</sup>

## Abstract

Obtaining and submitting documentation related to disabilities to instructors is a known barrier to students accessing necessary accommodations. We assessed whether the implementation of a universal course design procedure, an automatic re-weight for students who missed a midterm exam without requiring documentation, was associated with differences in midterm examination attendance relative to a previous course offering when documentation was required for such an absence. In 2018, a large ( $n = 1897$ ) first-year course introduced a fall midterm examination that required documentation for assessment reweights resulting from a missed exam, and in 2019 ( $n = 1795$ ) assessments were automatically (i.e., no documentation required) re-weighted for students who missed the exam. We expected that the midterm attendance rate for the 2019 (no documentation required) exam would be significantly lower than the 2018 fall midterm exam attendance rate. However, our results revealed that removing the requirement for documentation was not associated with an increase in exam absences. These findings indicate that flexible practices can be effective in promoting accessibility while not significantly affecting student engagement and completion of summative assessments. However, we did not assess for any differences in learning because of this missed testing practice, and there are limitations such that these findings may not generalize to other student populations. We call for further discussion and research with respect to the learning-related consequences of re-weighting assessments.

*Keywords: accessibility, higher education, flexible design, inclusive design, assessment*

## Summary of Relevant Literature

Postsecondary educators and disability service employees in Canada and the United States are seeing continued increases in the prevalence of students requiring academic accommodations due to disabilities. For example, the prevalence of postsecondary students with learning disabilities (LD) has tripled over the past three decades, with current estimates ranging from 3-11% of the undergraduate student body having a diagnosed LD (Canadian University Survey Consortium, 2019; Cole & Cawthon, 2015; Joyce & Rossen, 2006; Kurth & Mellard, 2006). Although LD were previously the most common type of disability seen by disability service offices (DSO), mental health disabilities are increasing at a significant rate (Harrison, Holmes, & Harrison, 2018). For example, demonstrating the rapid rise in mental health disabili-

ties, community colleges in Ontario have had a 110% increase in mental health disabilities requiring accommodation from 2009-2015 (Deloitte Canada, 2017).

Given a diverse and changing landscape for student needs, postsecondary institutions must consider ways to support growing numbers of students with varied disabilities, and to reduce barriers to access. For example, known barriers to students accessing accommodations in higher education include lack of understanding of campus systems for support, concerns of instructor reactions, accessing documentation, and overwhelmed Student Disability Office (SDO) staff (e.g., Toutain, 2019).

Directly addressing the barrier of accessing documentation, the Association on Higher Education and Disability (AHEAD) has argued that medical documentation need not be required for the implementa-

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tion of disability related accommodations (Lovett et al., 2015). Instead, they argue that when determining appropriate accommodations, disability resource professionals should consider multiple forms of information including student's self-reported experiences, observations and interactions, and information from third parties as relevant. Importantly, students should not be subjected to burdensome processes to access their accommodations.

### Increasing Flexibility

There are a variety of ways in which the environment can be altered, without impacting learning outcomes, to provide flexibility and increase accessibility. The most proactive approach to increasing accessibility is to *design* for it. Designing for inclusion is exemplified by Universal Design (UD). Universal Design "is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability" (National Disability Authority, n.d.). There are a variety of applications of UD to education, including Universal Design for Learning (UDL; Rose & Meyer, 2000), Universal Design for Transition (UDT; Thoma et al., 2009), Universal Design for Instruction (UDI; Scott et al., 2003), and Universal Instructional Design (UID; Higbee, 2009). Although there are some differences between each of these approaches to designing for inclusion, they share the goal for developing and implementing best practices for increasing accessibility in education for students with disability (Reardon et al., 2021).

Designing for inclusion prior to delivering a course is best practice. In reality, (re)designing courses with fully inclusive content, delivery, assessment, and feedback channels may not be immediately feasible for instructors and institutions. Thus, it is helpful for instructors to consider methods to increase flexibility that do not require full course redesign, and that can be easily implemented. One model that has been proposed to support flexibility in course deliveries is to encourage instructors to think about just one thing (framed as "plus one") that they could do to increase flexibility (e.g., Behling & Tobin, 2018). It reflects the notion that even small changes can have significant impact, which inspired this current work.

### Depiction of the Problem

There is a need for courses to be inclusive, and an obligation for instructors to remove barriers to inclusion. As noted, providing acceptable documentation to justify the need for accommodation is a barrier for some students accessing necessary accommodations.

Further speaking to challenges surrounding documentation, having confidential health documentation shared across many courses creates risks of privacy violations, and confidentially managing this information may be especially challenging for instructors in large courses. The current work demonstrates outcomes in a large course when the need for documentation for missing a midterm test in order to have academic adjustment (re-weighting) applied was removed, removing a known barrier for students, and also reducing administrative challenges for instructors.

### Description of Practice

We conducted the current study in a large, full-year introductory psychology course. The practice described in the current work is focused on the eliminated need for documentation for a missed midterm test, and the impact this had on attendance.

In 2018, the course implemented a fall midterm examination to help provide students with early feedback regarding their learning. The midterm was intended to be reflective of a typical final examination-testing environment to provide students with early and lower-stakes exposure to a testing situation. If students missed the midterm in 2018 for any reason, including reasons due to disability or extenuating circumstances such as illness, documentation was required for academic adjustment. Students also required documentation for extra time required due to a disability. In 2019, the course again included the fall midterm examination (worth the equivalent grade weight as 2018) but also implemented design features that allowed flexibility for students who needed additional time as well as flexibility for those who could not attend the exam without the need for documentation. Specifically, we provided all students with time-and-a-half (a common accommodation for disabilities) and implemented an automatic re-weight policy such that, for students who missed the exam for any reason, the midterm exam grade weight was automatically shifted to the December exam. In addition to significantly reducing burdens for students who had to miss the exam for any reason and increasing accessibility for students who required extra time but did not have access to accommodations for any reason, these features also helped to minimize DSO time pressure for assessment early in the academic year, eliminated the need for students to disclose and submit documentation for review, reduced email volume related to missing the assessment, and reduced the number of manual overrides in the LMS gradebook (the adjustment was made at the course-level with a formula applied to all grades, rather than on a student-by-student basis).



As a result of waiving the requirement for documentation to access extra time or to reweight assessments if the exam was missed, we expected that the midterm attendance rate for the 2019 (flexibly designed) exam would be significantly lower than the 2018 attendance given the lack of consequences for missing the assessment, and that this would necessitate a reconsideration of how to begin to create more inclusive assessments in a large course.

### **Participant Demographics**

The 2018/2019 participants were 1897 students in a large first-year course who were enrolled in the course on the date of the October exam. The 2019/2020 participants were 1795 students enrolled in the same large first-year course the following academic year on the date of the October exam.

### **The 2018 Examination**

In both the 2018/2019 and 2019/2020 course deliveries, the introductory course had three exams: one in October (midterm), one in December (midyear) and one in April (end of year). The 2018 October midterm examination was 1.5 hours in length and included 30 multiple choice and three short-answer (written response) questions. The exam was worth 15% of the course grade, with the short-answer section worth 2/3 of the exam score (10% of the course grade) and multiple-choice section worth 1/3 of the exam score (5% of the course grade). A total of 1,811 students (95.5%) wrote the exam out of a total of 1897 students enrolled at the date of the October exam. Students who had formal documentation requiring accommodations due to a disability approved through the SDO, or who requested academic adjustment and were approved through the Faculty office, had their midterm exam course weight shifted to the final exam. Students without approved documented absences were assigned a grade of 0% on the exam. Students that required extra time on the exam, or other such accommodations, needed to have official SDO-produced letters of accommodation. Obtaining these letters required an intake appointment with the SDO. Rates of students who had access to accommodations on the date of the exam are not available.

### **The 2019 Examination**

In 2019, the midterm examination was comprised of 60 multiple-choice questions and was designed to take 1-hr in to complete. The exam was also worth 15% of their course grade. As previously mentioned, in 2019 we implemented policies that allowed students flexibility for missing the exam without the need for documentation, and time-and-a-half was

granted to all students, eliminating the need for students with disability to engage with systems to access accommodations for extra time. Specifically, all students were given 1.5 hours to complete the 1-hour exam (“time-and-a-half”), and any students absent for the exam automatically had their midterm exam weight shifted to the December midyear exam (no documentation required). A total of 1,741 students (96.9%) wrote the exam out of a total of 1795 students enrolled at that date.

### **Evaluation of Observed Outcomes**

Contrary to our expectations, eliminating the need for documentation for missing the exam to access academic adjustment did not increase absences for the exam: the attendance rate was 95.5% when documentation was required for academic adjustment in response to missed exams in 2018, and it was 96.9% when the requirement for documentation was removed in 2019.

### **Implications and Portability**

Higher education must design inclusive and accessible courses. Although there are many formal frameworks for universal design as applied to education, linking with the zeitgeist of “plus one” (Behling & Tobin, 2018), formal adoption of a framework for inclusivity in the classroom is not required to have substantial impact for students. Indeed, integrating flexible practices in existing courses can be quite easy for instructors and yet have significant positive benefits for students. Our naturalistic comparison provides some support for the notion that flexible practices can be effective in promoting accessibility, while actually *minimizing* administrative resources, with no significant impact on student engagement and completion of critical assessments.

Despite the necessity of increasing accessibility, and despite instructors generally having positive attitudes towards flexible design practices, some instructors may not put flexible design practices into action (Lombardi, Murray, & Gerdes, 2011). The current work provides one example of flexible design that can be shared with instructors of a large course. We hope that the current work also inspires instructors, and their disability support teams, to systematically implement flexible design in courses. Specifically, instructors and SDOs can work as a team to support inclusive, accessible, and high-impact educational practices. Instructors may be willing and eager to increase accessibility in their courses but may have reservations about the feasibility of such practices.

Yet, as our work and the work of others (e.g., Behling & Tobin, 2018) demonstrates, there are ways that courses can become more flexible with low administrative challenges. Indeed, in our work, we *reduced* administrative challenges in our quest to increase accessibility. By equipping SDO staff with insights into high-impact teaching practices that facilitate accessibility, and by sharing design practices and assessing their outcomes, postsecondary teams can collaborate to develop systems that are student-centered and effective at facilitating student success.

Student needs, world events, and local contexts must be considered intentionally when considering the impact of flexible design practices. For example, in the current work, the assessments were held early in a first-year course. As a result, students may have been unfamiliar with accommodations available to them, and thus less likely to access them. Further, considering that the timing of this assessment occurred relatively early on in the academic year, students may not be facing the same stressors relative to the final exam period when conditions may be more likely to flare with increased stress. Factors like these, and others including impacts from the pandemic, highlight the risk in generalizing these findings, and indeed these factors would be interesting moderators to further explore for the efficacy of flexible design features.

Individual implementations of flexible course design may not always be beneficial, and accommodations such as reweighting need to be considered carefully. Of course, missing assessments might mean that students have not demonstrated their learning of key outcomes, but there are perhaps even more important considerations related to *learning*. Research demonstrates that the act of testing itself can increase learning (Roediger & Karpicke, 2006). It could be that using re-weighting as a strategy to increase flexibility ultimately disadvantages students by removing the opportunity for them to take an exam (versus a practice exam). Another potential unintended consequence of re-weighting exams involves the increased pressure on the subsequent assessment. This increased pressure on a later assignment may result in negative outcomes, especially for students who have conditions that become exacerbated with stress.

### Limitations

It is important to note that we used a non-experimental design. Thus, confounds were potentially present. For example, the components of the exam varied from 2018 to 2019. Specifically, the 2019 exam contained multiple choice only, whereas in 2018 there were also written answer questions. All students were

additionally provided with extra time in 2019 which was not present in 2018. We anticipated reduced attendance in 2019 when these flexible practices were implemented and did not find evidence of this, but it could be that students felt more willing to engage in a multiple-choice only exam, especially with extra time, and students were therefore more willing to take the exam. Further, it could be that re-weighting to the December exam, which tested more material, was undesirable and writing the test was perceived by some as being better than reweighting it.

Limitations such as the lack of experimental research addressing learning outcomes associated with various forms of flexibility, highlight our call for further quantitative research on the outcomes associated with variety course design practices. Indeed, others have also made this call (e.g., Cumming & Rose, 2021). Capitalizing on educational shifts as a result of COVID-19, it may be that some unexamined empirical evidence already exists to address outcomes associated with increased flexibility. For example, in light of the pandemic and other significant world events, many institutions have encouraged instructors to be flexible with deadlines and assessment requirements. These newly implemented flexible practices may provide a unique opportunity for instructors to reflect on the benefits and challenges associated with reducing barriers to participation with the benefit of Learning Management System (LMS) and historical data.

In conclusion, there is a need to increase accessibility in higher education. We argue that empowering SDO staff with ideas for small, evidence-based changes towards flexibility that can be suggested to instructors can have significant positive benefits for students. We also argue that quantitative research on the outcomes associated with inclusive course design practices will help to identify benefits and challenges of flexible course policies for students, instructors, and higher education systems more broadly. By identifying these benefits and challenges associated with various types of flexible design, and their common moderators, practices and systems can be developed in ways that support student success.

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# JPED Author Guidelines

## Purpose

The purpose of the *Journal of Postsecondary Education and Disability* (JPED) is to publish research and contemporary best practices related to disabled college students, college and university disability services offices, disability educators, and disability studies as a field within and lens for the study of higher education institutions. The sponsoring organization for the JPED is the Association on Higher Education and Disability (AHEAD), the primary source of disability related expertise on accessibility, legislation, rights, and any other disability-related information as it pertains to higher education. Consistent with the overall goals of AHEAD, each JPED article includes practical *implications for disability services educators* in colleges and universities.

## Review Process

The JPED is peer-reviewed and uses a masked-in-both-directions review process. Although our reviewers take care to provide developmental feedback, it is essential that prospective authors follow the guidance and formatting instructions in this document carefully. The editorial process is not typically able to address major issues of conceptualization or craft in a way that leads to eventual publication.

## Manuscript Topics and Types

Published manuscripts will advance JPED's purpose as detailed above (i.e., research, best practices, implications for disability services educators).

## Research Articles

Manuscripts demonstrate scholarly excellence using one of the types of articles described in the *Publication Manual of the American Psychological Association* (7th edition, American Psychological Association [APA], 2020) sections 1.1-1.8. These include quantitative, qualitative, mixed methods, replication, meta-analyses, literature review, theoretical, and methodological articles. *Inclusive of all manuscript elements (including title page, references, tables, and appendices) research articles cannot exceed 35 pages and typically are between 25-30 pages.*

## Practice Briefs

Manuscripts describe innovative programs, services, or contemporary best practices that support disabled college students or disability services, and are organized using the following first-heading levels (APA 2.27):

- **Summary of Relevant Literature:** provide a succinct summary of the most relevant and contemporary literature that provides context for what is already known about the practice/program.
- **Setting and/or Participants Demographics:** provide enough information about the implementation context for the practice described for the reader to make an informed assessment regarding similarity to their own practice environment-- using a pseudonym or compositing as needed to provide anonymity for participants / institutions involved;
- **Depiction of the Problem:** provide a statement of the problem being addressed.
- **Description of Practice:** briefly describe the intended outcome for the innovative practice/program and how it has been implemented to date. Tables and figures may enhance specific details.
- **Evaluation of Observed Outcomes:** summarize formative and/or summative data used to evaluate the efficacy of your practice/program; support claims with evaluation data.
- **Implications and Transferability:** discuss what has been learned and how this practice/program could be enhanced. Be realistic about any challenges encountered and how others seeking to replicate the practice elsewhere might experience them. Offer suggestions about what could be done differently in the future to achieve better outcomes. Provide a clear description of how and why other disability service educators should consider adapting your practice/program.

*Inclusive of all manuscript elements (including title page, references, tables, and appendices) practice briefs cannot exceed 15 pages and typically are between 8-12 pages.*

## Media Reviews

Prior to preparing a media review, please contact the JPED's Managing Editor (jped@ahead.org) to discuss the resource (e.g., book, film, online resource) you are considering reviewing. Media reviews provide:

- An overview of the resource, identifying the stated purpose, the author/creator and their viewpoint, and a general summary of the content.
- An evaluation of the resource's strengths, elaborating on the author/creator's objectives and how well those objectives were achieved.
- Recommendations about the audiences that might find the resource useful, why, and how you would suggest the resource be used. Please be sure to address its potential contribution to the field. For any gaps in the resource's content, rather than framing as weaknesses, consider offering suggestions about other works or perspectives that could be used in tandem with this resource. In other words, of what conversations in our field could this resource be an important part?

***Inclusive of the text of the review itself, media reviews should typically be between 750-1250 words. Media review submissions should also be accompanied by a complete APA reference for the resource reviewed as well as references for any additional citations in the text of the review.***

## Manuscript Preparation

All manuscripts must be prepared according to the standards of the APA publication manual (7th edition). Authors submitting manuscripts to the JPED will be well-served to thoroughly understand Section 12 of the APA manual where the publication process is described as preparing for publication, understanding the editorial publication process, manuscript preparation, copyright and permission guidelines, and during and after publication.

When submitting a manuscript to the JPED, follow these specific guidelines:

- Submit *one* complete Word document (.doc or .docx) that contains all manuscript components (i.e., title page, abstract, body, references, tables/figures).
- Provide a separate cover letter (APA 12.11) asking that the manuscript be considered for

publication and providing any other information that would be useful to the editors.

- Manuscripts should have one-inch margins in 12-point Times New Roman font. Double space the abstract, body, and references; single space the title page and tables/figures.
- The title (APA 2.4) should not exceed 12 words.
- Place the abstract (maximum 250 words, APA 2.9) on page two (following the title page). Include three to five keywords (APA 2.10) below the abstract (does not apply to book reviews).
- Use APA Section 1, Scholarly Writing and Publishing Principles, related to types of articles and papers; ethical, legal, and professional standards in publishing; ensuring the accuracy of scientific findings; protecting the rights and welfare of research participants and subjects; and protecting intellectual property rights.
- Use APA Section 2, Paper Elements and Format, to align paper elements, format, and organization. Indent paragraphs (APA 2.24), and adhere to heading levels (APA 2.27) to organize the manuscript.
- Content and method are important. Use APA Section 3, Journal Article Reporting Standards, related to overview of reporting standards; common reporting standards across research designs; and reporting standards for quantitative, qualitative, and mixed methods research. Please refer to Madaus et al. (2020) for research guidelines for higher education and disability where instructions are provided for describing samples and study locations, and appropriately selecting and describing the methodologies employed.
- Writing is important, carefully edit and proofread the manuscript. Use APA Section 4, Writing Style and Grammar, related to continuity and flow, conciseness and clarity, verbs, pronouns, and sentence construction. Use APA Section 6, Mechanics of Style, related to punctuation, spelling, capitalization, italics, abbreviations, numbers, statistical and mathematical copy, presentation of equations, and lists. Refer to APA 6.32-6.39 to properly report numbers expressed as numerals or in words.
- APA Section 5, Bias-Free Language and Guidelines provides guidance for writing about people, identity, and other topics wherein bias in writing is common. Although generally useful, this section's discussion of disability is reductive. Authors should follow their best judgment in this regard. Additional guidance is provided below.

- Regarding language related to disability, authors must determine the type of wording that is best for their given study - typically person-first or identity-first language. (See the “AHEAD Statement on Language” for details about these options and for additional resources on the topic.) We encourage authors to be explicit about their choices in the manuscript, informing readers about the rationale for their choice of language. When research or program participants are disabled and it is possible to determine their preferences, the preferred language of those individuals should be prioritized ahead of researcher or practitioner decisions. Additionally, aligned with the AHEAD statement in terms of outdated language use, we discourage “the use of outmoded euphemisms such as ‘special needs,’ ‘physically or mentally challenged,’ differently- or alternatively-abled, etc.” unless there is an explicit reason, such as referring to past practices or terminology to learn something valuable from it for current practice.
- Use APA Section 8, Works Credited in Text, related to general guidelines for citation, works requiring special approaches to citation, in-text citations, and paraphrases and quotations. All citations must be referenced, and all references must be cited; avoid undercitation and overcitation (APA 8.1). Double-space and block quotations of 40 words or more (APA 8.27).
- Provide a complete reference list (APA 2.12) rather than a bibliography following the manuscript. References should be formatted consistently, following APA examples in sections 9-11. Please be sure to carefully edit references as manuscripts will not be sent out for review until they conform to APA guidelines and references represent the most common challenge point for submitted manuscripts.
- Mask any information that could reasonably reveal the identity of the authors to the reviewers. For example, citations that would identify an author should be replaced with “citation omitted” and the corresponding reference removed from the reference list (APA 8.3). This does not mean that all author citations must be removed, only those that are likely to reveal an author identity by being self-referential. Those which are “in press” or “under review” should also be removed as they are typically from an author. Mask institutional identities in manuscripts if they are likely to reveal the institution of an author. Please do not use a title that can be searched in order to find a previous iteration of the work (e.g., a conference presentation, a dissertation). We will ask you to unmask these elements of your manuscript subsequent to acceptance. These examples are not exhaustive, but it is the author’s job to minimize any information that can reveal author identity.
- Tables and/or figures, following references, are in black and white only, and must conform to APA standards in APA Section 7. Follow examples related to table lines. Align numbers in tables to the single digit or the decimal. If tables and/or figures are submitted in image format (JPEG, PDF, etc.), an editable format must also be submitted along with a text description of the information depicted in the table/figure. This will be provided as an alternate format in the electronic version of the JPED, making tables/figures accessible for screen readers.
- In submitted manuscripts, all tables and figures should be placed at the end of the manuscript with a corresponding indication in the text, “< Place Table/Figure X approximately here>”. During layout editing, tables and/or figures should will be embedded in the text either as noted in the manuscript or after its first mention in text (APA 7.6)
- Do not include footnotes, instead, incorporate footnote narratives into the manuscript.
- Because of the importance of articles including practical implications for disability services educators in colleges and universities, authors will be well-served to include in the discussion a multiple paragraph subsection where practical implications for disability services educators are discussed.
- Before submission, ensure that the manuscript is ready by using strategies, examples, and checklists provided by APA:
  - o Sample papers (end of Section 2, pp. 50-67).
  - o Strategies to improve your writing (APA 4.25-4.30).
  - o Tables checklist (APA 7.20).
  - o Figure checklist (APA 7.35).
  - o In-text citation styles (Table 8.1).
  - o Examples of direct quotations in the text (Table 8.2).
  - o Reference examples (section 10 and 11).
  - o Manuscript preparation (APA 12.9-12.13).

## Manuscript Submission

Before you decide to submit your manuscript, authors are encouraged to read past articles in the JPED to better understand the types of submissions we print. All submissions will be through the Scholastica online system, easily accessed by clicking the “Submit via Scholastica” button on the JPED webpage.

- If this is your first time using our journal management system, Scholastica, you can sign up and create a free account. Directions for creating an account and logging in can be found in the Scholastica Author Guide.
- Enter your manuscript title, then click “save and continue.” After this page, if you have to pause and come back to complete this submission sometime in the future, you may do so by going to your "My Manuscripts" page and selecting this submission.
- Next, you can add the “metadata” for your manuscript (title, abstract, keywords), author information, and manuscript files. For all JPED submissions, we ask that you include:
  - A cover letter (APA 12.11)
  - A masked version of your manuscript
  - Any additional tables, graphs, and/or supplementary materials
- Once you’ve reviewed your completed submission form, you can “confirm and submit” and check “I understand” before submitting. You will not be able to make any changes to your manuscript once you click “submit manuscript.”

For more detailed information about submitting manuscripts in Scholastica, please refer to their Submitting a Manuscript guide. If you have any questions, please contact [jped@ahead.edu](mailto:jped@ahead.edu).

## Upon Acceptance for Publication

For manuscripts that are accepted for publication, we will request additional information. Once your manuscript has been assigned to a future issue, Valerie Spears (JPED Editorial Assistant) will contact the corresponding author to request: (1) a 40-50 word bibliographic description for each author; (2) and a signed copyright transfer form (Valerie will send templates for both); and (3) approval of galley proofs of the article ready for publication. Galley proofs will include required responses to specific copyediting suggestions. Authors may be contacted prior to this step to respond to copyediting, depending on the level and nature of the edits. Although JPED reserves the right to edit all material for space and style, corresponding authors will be notified of changes.

## Special Issues

The JPED occasionally publishes special issues which feature a series of articles on a particular topic. The JPED welcomes ideas for special topic issues related to the field of postsecondary education and disability or disability studies. The issue can be formatted as a collection of articles related to a particular topic or as a central position paper followed by a series of commentaries (a modified point/counter point). If the issue has the potential to be valuable to the readership of the JPED, modification to the journal’s content or format may be possible. Authors who wish to discuss a special issue should contact the editorial team at [jped@ahead.org](mailto:jped@ahead.org).

## Publication Information

JPED is published four times a year in multiple accessible formats (e.g., printed, DAISY, MP3, Text only, PDF), and each issue is distributed to nearly 4,000 individuals. All back issues are archived and accessible to all on the AHEAD website . These author guidelines are also available online.

JPED’s acceptance rate is moderately selective, accepting approximately 20% of all submitted manuscripts during the last calendar year. JPED is indexed in EBSCO, ERIC and Emerging Sources Citation Index. At present, JPED does not have an impact factor but is working with Clarivate Analytics’ Social Sciences Citation Index to obtain one.

## Editorial and Review Teams

The editorial team is composed of Ezekiel Kimball, Ryan Wells, Valerie Spears, Richard Allegra, and Cassie Sanchez. The review board is composed of more than 70 international disability scholars and disability services educators with expertise on disabled college students, disability services, disability studies, and research methodologies.

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