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The Breadth and Depth of Disability-Related Literature: From the Editor

Do you remember singing this song as a child?

*"Deep and wide, deep and wide,
There is a fountain flowing deep and wide."*

The lyrics of *Deep and Wide*, along with over 400 other childhood songs, were authored by Sidney E. Cox during his work with the Salvation Army. As I have matured in the academy, I have come to realize that there is a fountain of disability-related literature that is indeed both "deep and wide."

Many disability educators would attest to the complexity of working in the field. It begins with the definition of disability provided by the Americans with Disabilities Act, and its subsequent amendment, the multiple types of disability, what does not constitute a disability, and reasonable accommodations. This complexity is heightened by variations of definitions of disability, type, and accommodations by various countries.

Another complexity when working with students with disabilities is the intersectionality of personal identity, or the multiple dimensions of identity, and how salient those multiple social identities are to a person's essential self. For example, being female, belonging to a particular culture or ethnic group, and having a disability intertwine to form one comprehensive identity, rather than three different social identities. Furthermore, some of these identities are visible, others are invisible, and some are closer to the individual's core. Over the past 20 years, three primary authors, Elisa Abes, Susan Jones, and Marylu McEwen, have written on this topic in multiple publications (e.g., Abes, Jones, & McEwen, 2007). If this concept is a new one to you, I encourage you to read some of their work.

This issue of the *Journal of Postsecondary Education and Disability* is a good example of the breadth and depth of disability-related literature; it contains information about disability type (i.e., visual, ADHD, physical disabilities, and LD), educational interventions (i.e., coaching, aquatic exercise classes, STEM programs, and degree completion), and multi-national (i.e., Canada, Netherlands, United States) approaches to working with students with disabilities. The lead article in this issue examines the impact of transition services in facilitating college degree completion for students with visual impairments. **Paige Mask (Stephen F. Austin State University)** and

Vicki DePountis (Austin Independent School District) report on a case study of the complexity of the transition process for two students with visual impairments, both functionally blind, including perspectives on transition services, supports, and challenges faced by the participants during their high school and post-secondary years.

In the next article, **Elizabeth Ahmann (Maryland University of Integrative Health)**, **Lisa Joy Tuttle (University of Pennsylvania)**, **Micah Saviet (Towson University)**, and **Sarah Wright (private practice)** provide a review of ADHD coaching research. The authors deliver a description of ADHD coaching, a general overview of research on ADHD coaching, a detailed description of research on ADHD coaching for college students, implications for educational institutions; and suggestions for future study. The third article reports on the outcomes and perceptions of an inclusive aquatic exercise class for university students with physical disabilities. **Jennifer Dysterheft, Gioella Chaparro, Laura Rice, and Ian Rice (University of Illinois, Urbana-Champaign)** sought to determine whether university students with physical disabilities gained similar benefits from recreational physical activity participation as able-bodied university students. The researchers found no significant differences in pre/post changes between groups; however, thematic analysis of qualitative interviews indicated intervention participants perceived that numerous positive outcomes and experiences resulted from the intervention, very similar to those found in able-bodied university students.

In the fourth article, **Amy Lightfoot, Roya Janemi, and Debbie Laliberte Rudman (Western University)** present the results of a scoping review of research based in Canada and the United States that addressed the perspectives and experiences of post-secondary students with learning disabilities and/or attention deficit/hyperactivity disorder. Their findings support the need for inclusive learning environments, better access to accommodations, collaboration between all stakeholders, and educational initiatives to combat negative attitudes and beliefs regarding students with learning disabilities among peers and faculty. The fifth article applies salutogenesis to the experiences of students with disabilities in the Netherlands. **M. Dell'Olio, Lenneke Vaandrager, and Maria Koelen (Wageningen University)** sought to explain how students with disabilities identify and use

resources in order to reach their academic goals, and to understand how their sense of coherence (namely, a global orientation that expresses the extent to which a person feels that the world is comprehensible, manageable, and meaningful) developed over time.

In the final article, a practice brief, **Caroline Dunn, David Shannon, Brittany McCullough, Overtoun Jenda (Auburn University), and Mohammed Qazi (Tuskegee University)** describe a program designed to support college students with disabilities in a STEM program. The program, the Alabama Alliance for Students with Disabilities in Science, Technology, Engineering, and Mathematics (AASD-STEM), is a multicomponent program, with a major emphasis on mentoring. Preliminary program evaluation data highlighted positive changes in key attitudes and behavior related to STEM degree persistence and success for students participating in the AASD-STEM program.

The editorial team and review boards associated with the *Journal of Postsecondary Education and Disability* are proud to serve the disability services community by providing a forum for disability services educators to have access to the *breadth and depth of disability-related literature*.

Roger D. Wessel, Ph.D.
Executive Editor

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The Impact of Transition Services in Facilitating College Degree Completion for Students with Visual Impairments: Post-Bachelor's Degree Perspectives

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Vicki DePountis²

Abstract

This article portrays the complex nature of the transition process for two students with visual impairments (VI), both functionally blind, who successfully completed a bachelor's degree. Standardized open-ended interviews provided individual perspectives on the transition services, supports, and challenges faced by the participants with VI during their high school and postsecondary years. Key themes include access to the general education and expanded core curriculum, career and vocational awareness, support systems, self-advocacy and self-determination, independent living skills, social skills, and internship experiences. Transition discussion delineates the importance of evidence-based practices in secondary transition plans and provides recommendations for secondary VI practitioners and postsecondary institutions serving students with VI.

Keywords: Visual impairment, students with disabilities, transition services, postsecondary education, college success

Increasing numbers of high school graduates with disabilities are actively pursuing postsecondary education opportunities (Eckes & Ochoa, 2005). Students with disabilities, like all students, are motivated to pursue postsecondary education because of its potential to lead to a rewarding profession and financial independence. To be competitive in the job market, it has become increasingly important for students with disabilities to receive a college degree (Dowrick, Anderson, Heyer, & Acostal, 2005; Gil, 2007). Youth with hearing impairments or visual impairments (VI) are most likely of all categories to experience academic success (Wagner, Newman, Cameto, Garza, & Levine, 2005). Ninety percent or more finish high school, virtually all with a regular diploma. Youth with VI or hearing impairments are more than twice as likely as youth with disabilities as a whole to have enrolled in a postsecondary school.

This convergence of possibility and motivation has resulted in a nearly 66% increase since 1990 in the number of students with disabilities who enroll in postsecondary education (Wagner, Newman, Cameto, Levine, & Garza, 2006). The rise in numbers of students with disabilities pursuing higher education necessitates strong transition programs between high schools and postsecondary institutions (Eckes & Ochoa, 2005). In 2015, there were approximately

61,739 U.S. children (through age 21) who were classified as legally blind (American Printing House for the Blind, 2014). Comprehensive transition plans are especially important for students with VI, due to their having unique characteristics and accommodation needs. Students who are functionally blind cannot learn incidentally from their environment like their sighted peers. Instead, the expanded core curriculum must be systematically and sequentially taught using tactual or auditory modalities (Hatlen, 1996). The nine areas of the expanded core curriculum are compensatory skills including Braille, sensory efficiency, assistive technology, self-advocacy skills, social interaction, independent living, recreation and leisure, orientation and mobility, and career education. Individualized, often complex accommodations are essential for successful transition from high school to independent living, education, and employment settings.

The Individuals with Disabilities Education Improvement Act (2004) affirmed the role that school districts play in providing meaningful transition programming that fulfills a student's right to a free and appropriate public education and prepares them for further education, employment, and independent living (Wagner et al., 2005). Transition services are mandated to begin no later than the first Individualized Education Program (IEP) to be in effect when

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the child turns 16, or younger if determined appropriate by the IEP team, and updated annually thereafter. Landmark, Ju, and Zhang (2010) recommend that the IEP be developed using the student-focused planning strategy that promotes a student's active participation in developing the IEP and is related to student development in the areas of self-determination in both school- and work-based interventions.

Transition education concepts, important for all students, also should address nonacademic behaviors and experiences (i.e., acceptance of disability and how it affects learning, self-determination, self-advocacy, and interpersonal skills) that improve postsecondary school outcomes (Getzel, McManus, & Briel, 2004). Often, students with disabilities enter college unprepared to disclose their disability or lack the understanding of how to access services on campus (Brinkerhoff, McGuire, & Shaw, 2002; Getzel & McManus, 2005; Wagner et al., 2005). Under the Americans With Disabilities Act (ADA, 1990), a student needing accommodations must self-disclose the presence of a disability to a postsecondary disability support services office and provide proper documentation, which may include current assessments, accommodations that have worked in the past, and how the disability impacts the ability to learn and study effectively in a postsecondary education setting. This responsibility of self-disclosure and self-advocacy requires many college students with disabilities to abruptly adapt to a new set of challenges in managing their academic program along with managing their accommodations (Brinkerhoff et al., 2002; Getzel & McManus, 2005; Gil, 2007). As a result, school district IEP committee members must understand and promote not only the acquisition of grade-level skills for students with disabilities, but also the development of self-advocacy and self-determination skills for students with disabilities during the middle and high school years in both school- and work-based settings (Cobb & Alwell, 2009; Gil, 2007). Additionally, IEP committee members and college disability support service personnel need to stay informed of the research on postsecondary outcomes for students with VI so that high school transition programs and college support services can be tailored to address the specific needs of students with VI. For example, Nagle (2001) reported that the best transition services for youth with VI include collaboration among agencies providing services, vocational assessment, vocational and social skills training, career education, paid work experience, and family involvement. Similarly, the research of Test et al. (2009) used correlational literature to identify the following evidence-based practices for improving the post-school

educational outcomes for students with disabilities: career awareness, inclusion in general education, interagency collaboration, occupational courses, paid employment or work experience, self-advocacy and self-determination, self-care independent living skills, student support, social skills, transition program, and vocational education.

Despite the evidence that with proper supports and accommodations, VI often do not hamper the academic performance of youth during high school and into college, youth with VI are 21% less likely to be employed than youth with learning disabilities, and their impairments can severely limit some kinds of employment options, even among college-educated youth with VI (Wagner et al., 2005). It is imperative to continue the investigation of secondary-level programs and practices that lead to improved post-school outcomes for youth with disabilities (Wagner et al., 2006). More specifically, research is needed that describes the transition services and experiences that students with VI report as facilitating their postsecondary education success and bachelor's degree completion.

This study involved two students with VI. The purpose of this study was threefold: (a) to give dual perspectives on the transition experiences, perceptions, and challenges of two students with VI who successfully completed a bachelor's degree; (b) to add practical significance to the research on transition variables (student characteristics and services) that facilitated college degree completion for two students with VI; and (c) to contribute to the literature the personal reflections of transition services and experiences that the students received and found meaningful in preparing them for postsecondary education success.

Method

Purposeful sampling was used for the identification and selection of information-rich participants related to the phenomenon of interest (Creswell & Plano Clark, 2011; Palinkas et al., 2013). Both participants were graduates from programs within the researchers' university department and received services from the university's disability support services office during their pursuit of a bachelor's degree. The purposeful sampling strategy has been determined useful when selected participants are available and willing to participate to communicate their experiences and opinions about the area of interest in an articulate, receptive, and reflective manner (Bernard, 2002). Interviews were conducted using a video-conferencing tool and a standardized open-ended interview format to obtain

information and pose probes in response to each participant's recounts (Turner, 2010). The video-conferencing tool was utilized due to the participants being relocated across the state after college degree completion and to allow the researchers the opportunity to recognize and incorporate social cues in the interviews (Opdenakker, 2006). These firsthand recounts on the applicability and meaningfulness of transition services might not have been portrayed otherwise, had the participants not been given the opportunity to express their thoughts and opinions in their own words, thereby providing insights from students with VI who were the direct recipients of transition services.

Procedure

The research notification, request for participation, and consent were conducted by email confirmation. Prior to the interview, transition questions were provided electronically to the participants to afford them time to recall previously provided transition services and experiences. In order to develop accurate and meaningful interview questions that elicited comprehensive information about the components of each participant's transition services, a review of federal rules and regulations and state administrative and education codes mandated for the education of students who are blind or visually impaired was conducted. Also, a review of the literature identified evidence-based practices for improved post-school education outcomes for individuals with disabilities. From these sources, an overlap analysis was conducted and the following key transition components were identified: access to the general education curriculum, career awareness and education, support provided by agency representatives, self-advocacy and self-determination, independent living, social interaction skills, recreation and leisure, and paid employment or work experiences. The interview questions were developed and critiqued for clarity and content by the researchers. Interviews were conducted individually with each participant and in two online video conferencing sessions. Interview one (nine questions) asked about specific goals and objectives and experiences that occurred during the participant's high school transition in the areas of career awareness; self-advocacy and self-determination; social experiences and recreation and leisure activities; independent living; and agency services. The participants were also asked about support systems that may have helped or encouraged them to attain their goals followed by the opportunity to provide any additional information regarding their high school transition experiences. Interview two (13 questions) asked about postsecondary participant competencies that facilitated the maintenance of pre-

viously learned transition skills; the development of new skills; as well as experiences related to self-disclosure and accommodations, overcoming obstacles, independent living, recreation and leisure, and meaningful relationships. Participants were encouraged to expound on information related to the research questions or any other area they felt facilitated graduation from college. Each interview session lasted approximately 75 minutes and was recorded.

The interviews were conducted by experienced faculty from the university's special education program. At the beginning of the interview, the participant was welcomed and given statements explaining informed consent and requesting permission to conduct and record the interview. One researcher served as the primary facilitator by asking the interview questions, probing for additional information as appropriate, and ensuring adherence to the established protocol. The second researcher took detailed notes throughout the interview. Notes generated during the interview were later expanded using the audio transcriptions. Transcripts were generated from the recorded interviews. The two researchers independently analyzed the transcripts and determined an inventory of topics that were similar or different between the participants' responses. The transcripts were then coded to summarize and sort responses according to transition categories that facilitated the participants' college degree completion. This project was approved by the university's Institutional Review Board for the protection of human subjects before the participants were selected.

Participants

Participant one was a Hispanic male student that is functionally blind. He was identified with VI at birth and received early childhood intervention services followed by special education and related services pre-kindergarten through Grade 12. He began his postsecondary education career at a two-year college. He received accommodations through the pursuit of his bachelor's degree and graduate degree. Audio recorded material was his preferred reading medium. He earned a Bachelor of Science in rehabilitative services and is currently pursuing a master's degree in rehabilitative services.

Participant two was a White female student that is functionally blind. She acquired a VI shortly after birth and received early childhood intervention services followed by special education and related services pre-kindergarten through Grade 12. She began her postsecondary education career at a university. She received accommodations through the pursuit of her bachelor's degree. Audio recorded material was

her preferred reading medium. She earned a bachelor's degree in interdisciplinary services with emphasis in special education and teaching students with VI. She is currently seeking employment.

Results

Access to the General Education and Expanded Core Curriculum

The secondary IEP and transition plans for both participants included general education coursework, direct instruction from a teacher for the visually impaired (TVI), and services from a counselor from the state agency's division for blind services. Both participants felt that the state residential school for the blind provided them with the most useful and meaningful education due to instruction in the expanded core curriculum which are the areas specific to blindness (i.e., living independently, how to use the vision you have effectively, using assistive technology, career exploration, and fitness and recreation).

Participant one spent his Grade 9 and Grade 12 years at a public high school and Grade 10 and Grade 11 years at the state residential school for the blind. He expressed frustration with the lack of comparable instruction and assistive technology supports provided between the public school education program and state residential school for the blind education program. Participant one stated,

Upon my return to public school for my senior year, I spent the first six weeks with my head on my desk because I had no assistive technology support or books in Braille. I was promised comparable services and supports by the IEP committee members.

Participant two studied entirely at her local public school. During the summer, she was provided short-term stays and two-day camps at the state residential school for the blind. Participant two expressed a degree of dissatisfaction with the alternating assistive technology and instruction provided to her from the public school TVIs. For example, during her elementary school years she was taught to use Braille. Then upon entry to junior high, she experienced an abrupt change to print which was based on the current TVI's training and theory that students need to be taught to use what vision they have more efficiently. While being aware of her need for Braille and other technologies, her self-advocacy skills were not developed to the point where she could question the TVI's assistive technology decisions and advocate for her need of Braille and other technologies. Participant two stated,

I knew print wasn't right for me. My vision while trying to take the state test in print was horrible. I knew I needed more Braille, more audio, and less print.

In high school, a reintroduction to Braille occurred; however, it was unsuccessful due to the last several years of print-based instruction. Participant two reported that the alternating back and forth between technologies complicated her learning experience. Fortunately, in high school she learned about Job Access with Speech (JAWS) which is a text to speech software. She continued to use JAWS throughout her college coursework.

Career Awareness and Vocational Education

For both participants, career awareness was developed through instruction from a public school TVI, the state residential school for the blind, and a state vocational rehabilitation training center. The vocational rehabilitation training program was part of a postsecondary transition experience for adults with VI. The length of stay was approximately nine months for both participants, and the emphasis of this training was to further the development of independent living skills and provide career exploration and guidance. In the university setting, neither participant chose to utilize the university's career services despite recommendations from the office of disability support services. Participant one stated,

I was encouraged to use the university's career services, but I thought they would not be able to help me based on what I perceived as their lack of disability awareness. I don't really have anything to base that on. Maybe career services could have helped me.

Agency Collaboration and Support Systems

Interview discussions with both participants made apparent that interagency collaboration occurred between four agencies. A review of the information found that both participants received assistance and interagency collaboration from the staff of four agencies: a TVI from the public high school, a counselor from the state agency's division for blind services, a state residential school for the blind, and a vocational rehabilitation training center for adults with VI.

Both participants shared stories of meaningful relationships with family members; school faculty (public, residential, and university); and counselors from the state agency's division for blind services who encouraged their development and independence at each stage of transition. Specific instances

of support recalled by participant one included high school IEP meeting attendance by a counselor from the state agency's division for blind services. This same counselor also supported his transition to the university setting by talking with the university disability office regarding his accommodation needs. From these experiences, he learned how to explain his case in an organized manner and advocate for his needs. A defining moment regarding his ability to be successful in the pursuit of his degree occurred with an English professor that held high expectations for his students. Participant one described this professor as "old school" and very demanding. He was not doing well in his class, so he visited the professor's office and they talked about literature and the class assignments. After getting to know this English professor, his expectations and taking another class from him, he earned an A on an assignment, and the professor asked if he could keep it. Participant one recalled, "When this professor asked to keep my paper, it was a true turning point for me. I realized I could really pursue a college degree, and I could experience success in college."

Participant two also recalled meaningful relationships with school faculty that held high academic expectations and developed her academic confidence and competence. In high school, she valued the support and friendship provided by a special education high school director that taught content mastery and attended her IEP meetings. Her high school math teacher was excited to know she was going to college and devoted months of after school instruction using all kinds of manipulatives so that she could pass the state high school exit-level math test. Participant two also reported benefiting from a challenging English teacher that required a lengthy research paper. Participant two stated, "She did not cut me any slack. She told me she believed in my work and empowered me by not treating me as something less than my peers."

Self-Advocacy and Self-Determination

Both participants talked about the evolution of their self-advocacy skills. During high school, supported self-advocacy learning opportunities were provided to the participants in IEP meetings. For Participant one, circumstances necessitated the rapid development of self-advocacy skills due to family members not being able to provide advocacy support during his high school years. Personnel at three well-informed organizations aided the development of his self-advocacy skills: an advocacy organization, a counselor from a state agency's division for blind services, and personnel from a state residential school for the blind. Participant two reported IEP meeting

self-advocacy support from her grandfather and guidance from a caring high school program director. Additionally, her grandfather encouraged her take on more responsibility in being informed of and managing her health-related issues.

While in the university setting, both participants shared stories of facing academic and attitudinal barriers when requesting accommodations. True to the literature, both participants reported struggles in securing basic accommodations, such as providing electronic texts or accessible notifications for students who are visually impaired. They described taking courses from instructors who were not knowledgeable in providing accessible course content to meet their assignment needs in the same time frame as for their nondisabled peers. These experiences necessitated continued self-advocacy and diligence in working with the university's disability support services to secure accessible course materials. Participant one stated,

When I would get home, I would figure out that the assignment was not accessible. I was having multiple incidences with assignments not being accessible online. I was also given printed information that was not accessible, despite my requests for accessible course material.

Participant two's self-advocacy skill development intensified in high school. Through IEP meeting attendance, she was taught how to speak up for her needs. With regards to her health issues and doctor's appointments, her grandfather started having her take over this responsibility by making her ask the doctors questions about her health and vision, and her grandfather would just listen. The most challenging self-advocacy tasks throughout college were dealing with professors to secure accessible course materials. On more than one occasion, she had to explain to her professors that they were required by law to fulfill her accommodation needs. She needed books on tape, or she would utilize a reader. She emphasized that it was hard to schedule with readers because they weren't always available. Participant two recalls a successful self-advocacy accommodation experience,

While taking a college math class, I was losing ability to see print. I had to talk to my math professor about doing tests orally in her office or using a reader. She was open to it, and I did my whole college algebra orally and made a B.

Independent Living Skills

When appropriate, transition programs are to include training that develops a student's ability to live independently and participate in the community (U.S. Code, 2016, § 300.43). Both participants reported high school training on independent living skills, with the most meaningful experiences occurring at the state residential school for blind (i.e., how to wash clothes, self-care, cane skills, travel, money management, requesting shoppers' assistance, and working with employers). The state school for the blind also provided opportunities for the participants to develop their recreation and leisure skills through community service work and regular social outings. Although campus travel became second nature, a recurring obstacle for both participants was managing the city's mass transit services.

Cleaning. In college, cleaning tasks could be both challenging and time consuming for the participants. For example, Participant one needed assistance in developing a system for washing his clothes and separating his white clothes from his dark clothes. He also needed someone he could trust to let him know which articles of clothing had permanent stains and which did not have stains. He learned this the hard way when one of his young nephews came to visit and needed to borrow a clean shirt. Participant one recalled,

When one of my young nephews came to stay with me and need a clean shirt, I said here you can wear this shirt and he said well it has a big stain on it. I thought, why didn't somebody tell me this before when I wore the shirt?

Participant two remembered challenges related to completing daily living tasks due to having to walk and down stairs. She also had a guide dog that she needed to make sure received plenty of work and care.

Shopping. Both participants utilized shopping assistance to purchase items needed for daily living. Sometimes it could take as long as 30 minutes to receive this assistance and then explicit instruction had to be given to the shoppers' assistant to make them understand what items were needed. For example, Participant two learned to ask specific questions to make sure the fruit she was purchasing was fresh or the item was the right size. She stressed that if she assumed these things, incorrect or random items could be put in her cart. Navigating transportation to and from the grocery store was time consuming. Participant one tended only to shop for one week's worth of groceries because he walked to and from the grocery

store. Participant two would call a cab or find a person from her church who was willing to take her back and forth from the store.

Traveling. At first, traveling around the campus was a challenge for both participants. Learning where things were on the campus became easier for Participant one, especially after all the university construction stopped. He eventually learned the campus so well that he could give guided tours to prospective university students. Participant two, while confident in her orientation and mobility (O & M) training, requested O&M services from the university's disability support services office to become familiar with the campus. Off-campus transportation was reported to take up a lot of time in the participants' day. The city's bus schedule was described as unreliable due to the bus showing up early or late. Participant two reported that whether it was a cab or paratransit, she was always waiting for some form of transportation. On a number of occasions, Participant one could not wait for the bus due to school internship responsibilities so he would just end up walking to the campus.

Social Interaction

In the public school setting, both participants talked about a TVI providing them with social skills learning experiences, such as requesting assistance in the community and determining and learning replacement behaviors for blindness behaviors (e.g., eye pressing or rocking). Participation in the high school band was also reported by both participants. Participant one was on the school's wrestling team. These experiences, although not direct in social skills instruction, afforded the participants with opportunities to develop social skills competencies with peers.

Both participants reported increased participation in social activities while attending a state residential school for the blind. Due to the state school's expertise, residential nature, and specialized training for students with VI, the participants had more resources (e.g., recreation center) and training in the expanded core curriculum that included service projects, community outings, and weekend activities. Participant two valued the relationships she developed with other individuals with VI and the easy access to videos with audio descriptions.

On the university campus, both participants reported decreased opportunities for social interactions. Participant one expressed concerns about inaccessible student organization activities. This barrier required the use of his self-advocacy skills on numerous occasions. Participant 1 reported that often he was the only person with an apparent disability in an organization, or in an activity, or in a position of leadership.

He was not able to participate in some student activities because they were not accessible. Sometimes he didn't even know there was an event going on, because he could not see that there was a flyer posted on the bulletin board. Participant one felt he burned some bridges with people as a result of his advocacy. Participant one also observed that many students with VI did not possess the social skills and confidence to engage in university student activities. Participant two demonstrated this concern when faced with rejection from a student government association and as result decreased her efforts to get involved in other student activities. Participant two stated,

One setback is that I applied for the student government association. I wrote a paper and filled out an application. I found out from my roommate that, because of my blindness, they didn't want to interview me. That was hard for me, and I just kind of dropped it, but it hurt my self-esteem. I didn't try hard to look for other stuff to join after that experience.

Internship and Work Experiences

Both participants had college internship work experience opportunities. Participant one had three college internship or work experiences and reported learning valuable lessons at each of the placements that facilitated developing his coping skills, self-initiating work tasks, educating his supervisor on his accommodation needs, and providing evidence to the supervisor about his ability to complete job tasks with accommodations. Participant one stated,

My supervisor didn't have much for me to do, and so at first she was hesitant to have me intern the entire day. So, I found work to do, because I didn't want her to see me wasting time. The supervisor was not as resistant at me being there by the time I left.

Participant two had teaching field-experience hours in a public school setting and a student-teaching experience in a state residential school for the blind. As part of her teaching field-experience, one of her professors in special education arranged for her to observe in a public school elementary classroom for students with VI. This site was chosen because the teacher herself also had a visual impairment. In addition to providing Participant two with teacher training, this teacher also shared stories about how she had to advocate for herself to secure and maintain employment. Participant two stated,

My public school field experience teacher understood my disability and assigned me work tasks that I could complete (i.e., creating alphabet study or flash cards using a braille typewriter called a Brailier) and strategies for working with the VI students and my learning to move about the campus.

The student-teaching experience for Participant two was more accommodating with respect to her disability due to the state residential school for the blind being accessible for both clients and employees with VI. During the student-teaching experience, student summary sheets had to be made accessible. She also realized that in a future job situation, she needed more skill development in the areas of organization, time management, and classroom management.

Discussion

Both university graduates with VI reported having transition services, supports, or experiences identified by the research as having improved postsecondary education outcomes for students with VI. While the degree of transition services and supports varied for each of the participants, the outcome was the successful completion of a bachelor's degree. Specifically, both participants received transition services that included access to the general education and expanded core curricula; agency support and inter-agency collaboration; self-advocacy and self-determination development; independent living skills; social interaction; career and vocational awareness; support systems that included family, school and agency personnel; and internship experiences.

The evidence-based practice of agency support was exemplified by both participants throughout high school and then again through interagency collaboration during transitions to postsecondary education settings (Nagle, 2001; Test et al., 2009). Both participants benefited from guidance and support from a representative from the state agency's division for blind services with respect to self-disclosure and requesting accommodations from college disability support services. This agency support coupled with previous training in self-advocacy helped minimize the participant's abrupt adaptation to postsecondary education challenges and managing their accommodations (Brinkerhoff et al., 2002; Getzel & McManus, 2005; Gil, 2007).

The participants' comprehensive transition plans included the evidence-based practices of access to the general education curriculum (Test et al., 2009) and instruction in the expanded core curriculum (Hatlen,

1996). While these curricula were provided to the participants, in both the public school and college settings the participants encountered barriers to accessing either the general education curriculum and/or college course curriculum. This example supports the findings of Pingry-O'Neill, Markward, and French (2012) that students with disabilities will encounter more attitudinal and physical barriers while attending college than students without disabilities. The lack of assessable course material required both participants to utilize the self-advocacy training skills taught in high school and mandated by federal and state rules and recommended by Getzel et al. (2004).

Due to the accommodation delays experienced by both participants, disability support services offices need to be strong advocates for students who need readers or publisher books on tape. An evaluation of the schedule of availability for providing readers consistently across a broad spectrum of high-need times should be conducted so that these services are streamlined for students with disabilities. Proactive strategies also need to be developed so publisher books on tape are readily accessible to students, thereby affording students with VI the opportunity to keep up with reading assignments and participate in class discussions the same as their nondisabled peers.

Next, inaccessible course material suggests that postsecondary faculty members need training on how to meet the accommodation needs of students with disabilities as well as fulfilling their legal responsibilities. The office of disability support services could play a key role in the development of this training while informing faculty of the office's ability to provide accessibility information and supports. The creation of online accessibility training is recommended. This training would need to be supported by the institution through a recurring annual or biannual training mandate. Recurring training would strengthen accessibility awareness among faculty and stress the importance of this mandate like other current training mandates (i.e., security awareness, training, and training on employment discrimination and sexual harassment).

Based on the participant reports, the instruction and efforts of skilled VI professionals provided the participants with individualized training and support in assistive technology, independent living skills, orientation and mobility, and education on postsecondary rights and responsibilities regarding self-disclosure and access to accommodations (ADA, 1990; Hatlen, 1996). This information implies that special education professionals in the public and state school systems were knowledgeable of the law and research for improved postsecondary outcomes and were

working diligently to provide appropriate transition programs and services that boosted the potential for a student with VI to complete a college degree. The services and supports received from TVIs at the state residential school for the blind and a counselor from the state agency's division of blind services were held in higher regard with respect to the role each played in imparting the participants with the necessary knowledge and skills for independent living and college degree completion. This information emphasizes the continued need for state agencies to participate in the transition programs for students with VI, from the earliest ages through postsecondary education. Also, in recognition of the significant contributions of these state agencies in the facilitation of student transition and postsecondary education outcomes, public school TVIs and other special-education-related service personnel should scrutinize and then advocate for specific evidence-based services and supports provided by the state residential school for the blind and division of blind services to be replicated for students with VI in the public school district setting.

A recurring obstacle for both participants was managing the city's mass transit services. This obstacle supports the findings of Crudden, Sansing, and Butler (2005) that transportation, especially in rural areas, was a major problem for those with limited mobility skills. Many postsecondary institutions already provide on-campus bus services to all students. These institutions may wish to consider weekly or bi-weekly bus services for shopping excursions, which would benefit all students and especially those with VI and limited mobility. It follows that students with VI or mobility needs would benefit from housing on the ground floor to more easily complete daily living tasks such as unloading purchased goods, managing laundry needs, or caring for a service animal.

At the postsecondary level, the participants lacked education and experience in utilizing support services designed for all students (i.e., counseling and career services). Perhaps this was because the participants had been trained to and always had access to special education supports. The utilization of counseling services might have helped Participant two work through her feelings of rejection by a student organization and to have the confidence to move forward in seeking out other student activities or organizations to join. This rejection example supports the findings of Pingry-O'Neill et al. (2012) that students with disabilities will encounter more attitudinal and physical barriers while attending college than students without disabilities.

Participant one's recount of internship supervisor bias and his strategies to prove his productivity

exemplify the findings of McDonnall, O'Mally, and Crudden (2014) who found that 67% of the employers in their study could not identify how employees with VI could use accommodations to perform routine job tasks, and that employers with greater levels of knowledge also had more positive attitudes towards persons with VI as employees. Neither participant reported using the university's career services office. This is especially disconcerting given the findings that youth with VI are 21% less likely to be employed than youth with learning disabilities, and their impairments can severely limit some kinds of employment options, even among college-educated youth with VI (Wagner et al., 2005). The findings that students with VI will encounter barriers to employment emphasize the need for students with VI to seek the expertise and guidance of a career counselor who can help them explore careers based on their interests, abilities, and values. Participant two expressed concern that she did not have the skills necessary for classroom management, which is integral to teaching. A career counselor can help students make informed decisions about the competencies and expectations of their career interests, giving them realistic insight into their ability to fulfill job duties and responsibilities. Participant one needed accurate information about the services provided by career services to dispel his belief that these services lacked disability awareness and were best utilized by his nondisabled peers. Career services could have provided Participant one with knowledge on how to search for jobs in his chosen career field, helping him prepare a quality resume, and improving his interview skills. The disability support services offices in postsecondary institutions can address this perceived lack of usefulness of services provided to all students by educating students on available university supports and encouraging students with disabilities to utilize these services for appropriate needs. The utilization of career service resources would have provided both currently unemployed participants with one more avenue in which to seek employment.

Limitations of the Study

Factors that limit the generalizability of the results include the following:

1. Only the participant's primary disability was identified as the focus of transition services.
2. Information from the participants was based on recall of transition services received in high school and postsecondary education.

Delimitations of the Study

Boundaries that were set by the researchers include the following.

1. The sample size ($N = 2$). A small sample size was used due to purposeful sampling.
2. The purposeful sampling strategy was used instead of the random selection of participants. The purposeful sampling strategy has been determined useful when selected participants are available and willing to participate to communicate their experiences and opinions about the area of interest in an articulate, receptive, and reflective.

Directions for Future Research

Participants' responses regarding post school employment indicate that even with assistance from community-based agencies, securing employment is complex, with logistical barriers that have not been resolved. Participant one did not secure full-time employment after the completion of his bachelor's degree and is currently seeking a graduate degree as a rehabilitation counselor. Participant two has diligently tried but not succeeded in finding full-time work in her field and is considering pursuing a master's degree. The current plight of the participants supports the research of Cavanaugh (2011) and Giesen and Cavanaugh (2012) that transition to employment is still particularly difficult for most adults with VI, even for those with a postsecondary education. Dorrick et al. (2005) suggested that specific job training and placement could help students with disabilities find competitive employment after completing a college degree and increase the likelihood for a start on a trajectory of success. Future research is needed on the impact of factors such as job placement and employers' willingness to redesign tasks to increase the likelihood of success for employees with VI.

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A Descriptive Review of ADHD Coaching Research: Implications for College Students

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Abstract

Relative to their typically developing peers, college students with Attention Deficit/Hyperactivity Disorder (ADHD) often have poorer adjustment to college, higher rates of class withdrawal and academic probation, and lower rates of retention. Supportive services for these students are still being researched and developed. ADHD coaching—increasingly recognized as an important component of multimodal treatment for individuals with ADHD—may be a useful support for college students. To examine this question, the authors conducted a comprehensive descriptive literature review of studies examining ADHD coaching outcomes. Nineteen quantitative and qualitative studies of coaching outcomes were identified. Of these, 10 focus specifically on college students. All 19 studies indicate that coaching supports improved ADHD symptoms and executive functioning. The majority of quantitative studies report statistically significant benefits; several report positive trends. Additionally, six studies report improved participant well-being; three demonstrate maintenance of gains; five document high participant satisfaction with coaching. The authors provide: a description of ADHD coaching, a general overview of research on ADHD coaching, a detailed description of research on ADHD coaching for college students, implications for educational institutions, and suggestions for future study.

Keywords: ADHD, coaching, executive functions, disability, college students

Attention Deficit/Hyperactivity Disorder (ADHD), characterized by core symptoms including inattention, hyperactivity, and impulsivity was once thought to be a disorder of childhood, but recent literature has suggested that as many as 40% to 60% of individuals diagnosed as children continue to experience symptoms or impairments related to ADHD into young adulthood (Sibley et al., 2016). Some research indicates that individuals with ADHD are less likely to attend college than are their non-ADHD peers, though attendance rates of students with ADHD has been increasing (e.g., Newman et al., 2011). Recent estimates of the prevalence of ADHD in college students have ranged from 2% to 8%; however, since ADHD often goes undetected in college, the actual prevalence may be higher (Blase et al., 2009; DuPaul, Weyandt, O'Dell, & Varejao, 2009; Garnier-Dykstra, Pinchevsky, Caldeira, Vincent, & Arria, 2010).

In comparison to their typically developing peers, emerging adults with ADHD have been found to ex-

perience a decreased quality of life across many domains: more academic difficulties (DuPaul et al., 2009; Weyandt & DuPaul, 2013); vocational and financial challenges (Barkley, Murphy, & Fischer, 2010; Weyandt & DuPaul, 2013); high-risk behaviors, including criminal arrest (Barkley et al., 2010); difficulties with social adjustment and self-esteem (Blase et al., 2009); and higher rates of psychiatric conditions such as anxiety, depression, and drug and alcohol abuse (Biederman, Petty, Evans, Small, & Faraone, 2010; Weyandt & DuPaul, 2013). Students with ADHD entering college often experience challenges—resulting from difficulty managing variable course schedules; expanded autonomy; decreased structure; an increased number of distractions; and reduced social supports, including a reduction in parental supervision and support—all of which compound the challenge of adjustment to college (Farrell, 2003; Knouse & Fleming, 2016). Relative to their peers without disabilities, college students with ADHD have poorer

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adjustment to college (Blase et al., 2009), with less effective study habits, lower academic performance, lower test scores and GPA, and higher rates of class withdrawal and academic probation (Advokat, Lane, & Luo, 2011; Blase et al., 2009; DuPaul et al., 2009). Furthermore, students with ADHD are less likely to complete degree programs (Advokat et al., 2011; Weyandt & DuPaul, 2013).

Although support services for students with ADHD vary by school, colleges generally provide disability accommodations such as extended time on tests, alternate testing location, or extended deadlines on assignments. Students can also make use of other on-campus services such as mental health counseling or writing centers as needed. Nonetheless, the National Longitudinal Transition Study-2 (NLTS-2) found that not all students with disabilities identify themselves to the school for purposes of receiving accommodations; not all who disclose receive accommodations or supports; and of those who receive accommodations or use supports (whether or not they had disclosed a disability), only slightly over half find these services “very useful” (Newman et al., 2011, p. 36). In fact, some 34% of students with disabilities sought support on their own, outside of that provided by schools; this figure was 40% among students at four-year colleges. Some students with ADHD may seek outside support because of stigma or because colleges infrequently offer the support for individualized skill acquisition, improvement in self-regulation, and goal attainment that are essential for their success.

There is strong evidence that combining medications and other modes of treatment (i.e., a multimodal approach) will best address ADHD symptoms and executive functioning (EF) challenges and promote improved functional outcomes (Hinshaw & Arnold, 2015; Knouse, Cooper-Vince, Sprich, & Safren, 2008). Medications are considered a first-line component of multimodal treatment for ADHD at any stage of life. A 2011 study assessing medication use, study habits, and academic achievement found that, of students with ADHD taking prescribed psychostimulants, 92% believed their medications had helped them improve academically (Advokat et al., 2011). However, psychostimulants do not always yield improvement in key skills and strategies required for college success. Numerous researchers have examined the role of motivation, self-regulation, and academic skills (time management, organization and planning, study skills, study habits) in college student persistence and achievement (c.f., Bean, 1985; Lotkowski, Robbins, & Noeth, 2004; Robbins et al., 2003; Tinto, 1975, 1993). In fact, a meta-analysis of the psychological

and educational literature found motivation, academic goals, academic self-efficacy, and academic-related skills to be the strongest predictors of retention (Robbins et al., 2004). For students with ADHD, psychoeducation, strategy instruction, and cognitive behavioral therapy are some other aspects of a multimodal treatment plan that have demonstrated benefit (Prevatt, Lampropoulos, Bowles, & Garrett, 2011; Prevatt & Young, 2014). Additionally, important functional areas for students with ADHD may be well addressed as key components of ADHD coaching. Although Hallowell and Ratey (1994) first described ADHD coaching for individuals with ADHD in print in *Driven to Distraction* in 1994, little was published on ADHD coaching before 2005. Since then, however, ADHD coaching has been increasingly recognized in the clinical literature as a useful and important component of multimodal treatment for individuals with ADHD (Barkley, 2015; Kooij, 2013; Murphy, 2015; Pehlivanidis, 2012; Pfiffner & DuPaul, 2015; Prevatt & Levrini, 2015; Sarkis, 2014). ADHD coaching is an approach to supporting students with ADHD that a growing number of colleges have begun to integrate (Goudreau & Knight, 2015; Parker, Hoffman, Sawilowsky, & Rolands, 2011). Rabiner (2014) commented that ADHD coaching focuses on:

Academic goal setting, progress monitoring, dividing long-term projects into a sequence of specific and manageable tasks – along with frequent contact to help students stay on track – [that] is consistent with the emerging consensus of ADHD as a disorder of executive functioning From this perspective, coaching may be a better fit than traditional therapy models, and could certainly complement whatever benefits students may receive from medication treatment. (para. 18)

ADHD coaching is a specialized form of life coaching that has been employed since the early 1990s as an assistive psychosocial process to help people affected by ADHD identify and employ strategies and skills to help both minimize the effects of ADHD symptoms on their daily lives and more easily achieve their personal goals. The most common description of coaching—not limited to ADHD coaching—is that promulgated by the International Coach Federation (ICF; <http://www.coachfederation.org>). In the ICF model, coaches are primarily considered process facilitators, and the coaching is confidential, client-centered, and client-directed. Coaches hold the stance that clients are resourceful and have agency to effect the changes they desire to make. Clients meet regularly with their coaches who employ Socratic ques-

tioning and invite clients to reflect on their strengths, challenges, and possible courses of action, both in the service of goal attainment and to support full expression of potential. Coaches also provide the structure and accountability that support clients as they work towards their self-identified goals (ICF, 2007, 2015).

Coaching has variously been described as “the art of facilitating the learning, development, and performance of another” (Downey, 2001, p. 15); “unlocking a person’s potential to maximize their own performance” (Whitmore, 1992, p. 8); and a catalyst for “sustained cognitive, emotional, and behavioral changes that facilitate goal attainment and performance enhancement,” both personal and professional (Grant & Stober, 2006, p. 2). This emphasis on performance is the hallmark of ADHD coaching: while coaching may share with psychotherapy outcomes such as self-awareness, insight, and emotional self-regulation, its primary focus is setting goals, developing strategies, and taking action to get things done (Favorite, 1995). In fact, it is frequently an inability to “get things done” that leads people with ADHD to seek the assistance of an ADHD coach. A central aim of the ADHD coaching process is, therefore, to support behavior change by employing approaches that promote a client’s ability to “better manage their lives by learning to set realistic goals and stay on task to reach those goals” (Murphy, 2015, p. 753).

As a still emerging coaching specialty, there is no single definition of what specifically comprises ADHD coaching (Wright, 2014). Wright described professional ADHD coaching as “a seamless blend of three elements employed by the coach as needed” (pp. 22–23): (a) life coaching; (b) providing education about ADHD and how it might be affecting the client; and (c) working with the client to develop external systems and strategies tailored to the client’s needs and environment that shore up the client’s executive functioning skills. As ADHD is increasingly understood as an implementation problem (Ramsay & Rostain, 2016), by necessity, ADHD coaching addresses the need for development of skills and strategies to manage the often significant pragmatic challenges faced in achieving one’s aspirations while living with ADHD. As an example of this process, Quinn, Ratey, and Maitland (2000) provided the following general description of ADHD coaching for college students:

A coach can help a student take action on his or her goals by working together to:

- Clearly define and prioritize goals.
- Anticipate roadblocks that might prevent follow through on those goals.

- Develop strategies to address roadblocks.
- Create reminder systems to promote self-monitoring and improve follow through between sessions.
- Provide external accountability and evaluate progress toward these goals. (p. 17)

As Tuttle, Ahmann, and Wright (2016) described, ADHD coaching shares common elements with other psychosocial treatments; however, the following key factors distinguish it as a unique approach:

- Egalitarian and nonclinical: Partnership model with a personal-development orientation.
- Focus on skill acquisition and implementation: Targets clients’ specific performance issues with personalized implementation plans and skill set development.
- Flexible structure: Client may meet with coach remotely (phone, video-conference), or may meet in nontraditional settings (workplace, library).
- Increased accessibility and accountability: Access to coach between sessions (text, phone, email) bolsters client accountability and engagement.

ADHD coaches are not trained to address complex comorbidities. Instead, certification bodies, in their ethics codes, indicate that clients with such concerns should be referred to appropriate mental health care provider(s) either in lieu of or in concert with coaching (ICF, 2015; Professional Association of ADHD Coaching, 2015). A growing number of mental health professionals, recognizing the merits of the coaching paradigm, are expanding their practices to include coaching or utilizing coaching techniques in their work with clients, either adopting the ICF-derived model (Williams & Davis, 2007) or employing models of their own (e.g., Prevatt & Levtrini, 2015).

The purpose of this study was to provide an overview of the current empirical foundation for ADHD coaching, with a particular focus on coaching for college students. This study consisted of a descriptive review of the literature on ADHD coaching outcomes, exploring the following research questions:

1. What comprises the current body of research literature examining outcomes of ADHD coaching?
 - a. How many research studies have examined outcomes of ADHD coaching; and of these, what subset addresses coaching for college students?

- b. What types of studies, including sample sizes, comprise the research on ADHD coaching?
2. What theoretical frameworks for ADHD coaching are identified in the research literature?
3. What are the characteristics of the sample participants in the ADHD coaching research literature?
 - a. What ages of participants were studied?
 - b. How was ADHD diagnosed in the studies of ADHD coaching?
4. What are the characteristics of the coaching programs studied?
 - a. Did coaching occur individually or in groups?
 - b. What coaching models are described?
 - c. What was the training of the coaches?
 - d. What was the frequency and duration (number) of coaching sessions, and length of individual coaching sessions?
5. What outcomes of ADHD coaching are identified in the research literature? In particular, what outcomes are identified and what outcome measures are used in the coaching research specifically among college students?
6. Describe in detail the research on ADHD coaching, in particular, the research among college students.

Method

Search Strategy

Research studies reviewed herein were identified as of December 2016, through online searches on Pubmed/Medline, EBSCO Megafire, Google Scholar, and ERIC databases using search terms including “ADHD,” “executive functions,” and “coaching.” Several studies also were identified through cross-referencing citations in articles or books and identifying grey literature through a generic Google search. “Gray Literature or ‘Grey Literature’ is literature (often of a scientific or technical nature) that is not available through the usual bibliographic sources such as databases or indexes. It can be both in print and, increasingly, electronic formats” (Outten, 2016, para. 1). Grey literature is increasingly recognized as an important and useful addition to systematic literature reviews. In fact, the *Cochrane Handbook for Systematic Reviews of Interventions* includes a section titled “Including unpublished studies in systematic reviews” (Sterne, Egger, & Moher, 2011).

Inclusion and exclusion criteria. Although mentioned elsewhere as useful in ADHD treatment (e.g.,

Barkley, 2015), studies of “parent coaching” were not included in this search. Only studies of ADHD coaching that examined coaching outcomes were selected for this review. One additional study examining the impact of the use of between-session assignments (BSAs) on coaching success among college students (Prevatt et al., 2011) explored a factor impacting outcomes and, for this reason, was described in this review, although not tallied among the outcome studies.

While identified studies used varying methods of establishing an ADHD diagnosis, diagnostic approach was not an exclusion criterion for studies in this comprehensive review. Additionally, theoretical or conceptual frameworks used for the coaching and training of the study coach(es) varied among studies but these also were not exclusion criteria as the aim of this review was to be comprehensive. The term “ADHD coaching” will be used throughout this article to describe both ADHD and executive skills coaching, as they are very similar.

Identification of Theoretical Frameworks

The second author of this study, trained as a mental health clinician, reviewed the methods section of each research study to identify the theoretical framework or frameworks used. For each study, if the report overtly identified a particular framework, that was ascribed to the study. If a framework was not overtly identified, the framework ascribed to the study was determined based on the outcome variables studied and/or the measures used. In some cases, if a framework was overtly identified and the outcomes studied and/or the measures used suggested an additional theoretical framework, this additional framework was also ascribed to the study.

Identification of Study Designs

The first author of this study has a research background and reviewed each study to categorize the study design. Most authors of reviewed papers overtly identified their study design (e.g., randomized controlled trial, mixed methods, qualitative), and, when this was the case, that classification was used. When a study design was not overtly identified, the first author reviewed the study methodology in detail and ascribed a study design most representative of the methodology described.

Identification of Outcome Categories

The first and second authors reviewed both the outcome variables identified in each study and the specific measures used for each outcome. Based on these variables and measures, they jointly established categories of study outcomes.

Findings

Research Question (1): What comprises the current body of research literature examining outcomes of ADHD coaching?

1-a. How many research studies have examined outcomes of ADHD coaching; and of these, what subset addresses coaching for college students?

We identified nineteen studies directly addressing ADHD coaching outcomes. Sixteen of these studies were published in peer reviewed journals; one study was reported in a book (Dawson & Guare, 2012); one was a dissertation (Reaser, 2008); and one was a paper presented at the AHEAD conference and found online (Maitland, Richman, Parker, & Rademacher, 2010). Seven of these 19 studies examined ADHD coaching for children and teens and are mentioned herein, but reviewed in detail elsewhere (Ahmann, Saviat, & Tuttle, 2017). Two extant studies of ADHD coaching for adults are also mentioned, but not reviewed in detail herein. The remaining 10 studies, all of which examined outcomes of ADHD coaching for college students, are described in detail in this article.

1-b. What types of studies, including sample sizes, comprise the research on ADHD coaching?

As illustrated in Table 1, the 19 studies exploring coaching outcomes comprised varied study designs, including quantitative and qualitative approaches. Two studies were randomized controlled trials; one of these focused on college students. Fifteen of 19 studies lacked control groups, although three were multiple-baseline studies for which this was not a concern.

The number of individuals receiving coaching interventions in studies to date varied widely. Of the studies of coaching for college students, seven were relatively small (fewer than 25 participants in the intervention group) and two studies were larger (Field, Parker, Sawilowsky & Rolands, 2010a, 2013; Prevatt & Yelland, 2015) with sample sizes of 88 and 148, respectively.

Research Question (2): What theoretical frameworks for ADHD coaching are identified in the research literature?

In the 19 studies examining ADHD coaching outcomes, six theoretical frameworks were used, either singly or in combination (see Tuttle et al., 2016). In decreasing order of frequency, these were: (1) executive functioning (12 studies); (2) psychoeducation (five studies); (3) self-determination/empowerment (five studies); (4) cognitive behavioral (three studies); (5) emotional intelligence/interpersonal skills (three studies); and (6) self-efficacy and social learning (one study).

Research Question (3): What are the characteristics of the sample participants in the ADHD coaching research literature?

3-a. What ages of participants were studied? As indicated in Table 1, studies examined coaching for elementary, high school, and college students, as well as adults. Ten studies addressed coaching outcomes for college students.

3-b. How was ADHD diagnosed in the studies of ADHD coaching? As indicated in Table 2, studies of ADHD coaching were inconsistent in the way an ADHD diagnosis was established. Six of the 10 studies of coaching for college students determined an ADHD diagnosis based on documentation having been accepted by the school's disability services office.

3-c. What factors are identified that impact coaching success? Table 3 outlines eight factors identified in the research literature as potentially related to coaching success. Most of these factors were individual characteristics; some were aspects of the coaching program itself.

Research Question (4): What are the characteristics of the coaching programs studied?

4-a. Did coaching occur individually or in groups? As detailed in Table 4, three of the 19 studies of coaching examined coaching in groups. The other 16 studies (including all ten studies of college students) examined outcomes of individual coaching.

4-b. What coaching models are described? Although not all ADHD coaching outcome studies described the coaching model used, a number of models were specified in the extant research. (Note that models understandably related closely to the theoretical framework of the studies.)

Dawson and Guare's (2012) executive skills coaching model was used in four studies of coaching for children and teens (Dawson & Guare, 2012; Merriman & Coddington, 2008; Plumer & Stoner, 2005; Vilardo, DuPaul, Kern, & Hojnoski, 2013). This approach to coaching began with long-range goal setting followed by brief (e.g., 10 minutes), often daily, coaching sessions, drawing from correspondence training research: "goal setting, self-monitoring, performance feedback, and/or contingency management" (Merriman & Coddington, 2008, p. 314).

Two studies among children and teens used coaching interventions as part of either multimodal treatment (Garcia Ron, Serrano Grasa, Blanco Lago, Huete Hernani, & Pérez Martinez, 2016) or a broader intervention (Evans, Schultz & DeMars, 2014). Wentz, Nydén, and Krevers (2012) used a model of Internet-based support and coaching for adolescents and young adults.

One study of coaching for college students used a peer coaching model in which college student “coaches” were trained by the school’s Coordinator of Student Disabilities (Zwart & Kallemeyn, 2001). The training included education on ADHD and learning disabilities, as well as diagnostic information pertinent to college students; introduction to a resource library at the college and relevant websites; practice in time-management skills; and instruction in promoting student self-advocacy skills. Among the other studies of coaching for college students, two (Swartz, Prevatt, & Proctor, 2005; Reaser, 2008) used a coaching model based on life coaching and an approach to ADHD coaching described by Quinn et al. (2000). Another study (Prevatt & Yelland, 2015), used a similar approach: an EF-focused, CBT- and psychoeducationally-oriented coaching intervention, modeled on Swartz et al. (2005).

Three studies of coaching for college students used the Edge/JST model (see Field et al., 2010a, Appendix A), an approach providing life coaches with additional training to work with the unique challenges of youth with ADHD (Field et al., 2013; Parker et al., 2011; Parker, Field, Sawilowsky, & Rolands, 2013). Coaches using this model helped students assess their needs and set goals; provided assistance with structure, strategies and skills addressing individual challenges in EF and ADHD symptoms, such as focus, organization, prioritization, and persistence; offered support and accountability; and promoted self-confidence, self-advocacy, and success in goal attainment.

4-c. What was the training of the coaches? As indicated in Table 4, in the extant ADHD coaching research, the training and background of coaches was varied, including peer and “trained coaches.” The term “trained ADHD coach” is used in this review to simply mean non-peer coach and comprised both informally and formally trained coaches.

4-d. What was the frequency and duration (number) of coaching sessions, and length of individual coaching sessions? The frequency of the coaching intervention varied among studies (see Table 3). All studies of college students used a model of weekly coaching sessions.

The duration of the coaching intervention was also heterogeneous in studies reviewed. As indicated in Table 3, interventions comprising daily coaching sessions typically provided a higher total of sessions.

Not all studies reported the length of individual coaching sessions, but there was wide variation among those reported. For studies utilizing daily sessions, for example those involving peer coaching for younger students, 10 minutes was the typical session duration (e.g., Plumer & Stoner, 2005; Vilardo et al.,

2013). Of the studies reporting weekly coaching, including those involving coaching for college students, sessions generally ran 30-60 minutes in length.

Research Question (5): What outcomes of ADHD coaching are identified in the research literature? In particular, what outcomes are identified, and what outcome measures are used, in the coaching research among college students?

The research on coaching outcomes examined a range of outcome variables, falling generally into the following categories (see also Table 5; note that not all studies examined all of the same variables or used the same measures):

- ADHD and executive functioning symptoms, and related behaviors (19 studies, including all 10 studies of coaching for college students);
- Self-esteem, well-being, and quality of life (seven studies, six of which were studies among college students);
- Improved family functioning (two studies, both among elementary school children); and
- Satisfaction with coaching (nine studies, four of which were studies among college students).

ADHD/EF symptoms and related behaviors.

Seven of the 10 studies among college student used the LASSI (Learning and Study Strategies Inventory; Weinstein & Palmer, 2002), or select subscales, as a measure of EF. The LASSI, a self-report instrument used in several studies of ADHD coaching, measures students’ awareness and use of skills and beliefs related to academic success in college. The LASSI has 10 subscales in three clusters: (1) Skill (i.e., Information Processing, Selecting Main Ideas, Test Strategies); (2) Will to learn (i.e., Anxiety, Attitude, and Motivation); and (3) Self-regulation (i.e., Concentration, Self Testing, Time Management, and Study Aids [Study Aids was replaced with Using Academic Resources in 2016]; Weinstein & Palmer, 2002; Weinstein, Palmer, & Acee, 2016; Weinstein, Schutte, & Palmer, 1987). Richman, Rademacher, and Maitland (2014) use the LASSI differently: as a measure of beliefs and behaviors related to academic success. Two studies used other scales to measure EF: Maitland et al. (2010) used the Life Participation Scale-Adult (Saylor, Sutton, & Khan, n.d.), a measure of adaptive functioning and Richman et al. (2014) used the BRIEF-A (Behavior Rating Inventory of Executive Function—Adult Scale; Roth, Isquith, & Gioia, 2005). The Parker et al. (2011) study used grades as an

outcome measure. Seven of the college studies also documented improvement in EF skills and/or goal attainment using qualitative approaches.

Self-esteem, well-being, and quality of life. This outcome comprised a wider variety of variables and measures among college students. Zwart and Kallemeyn (2001) measured self-efficacy using the General Self-Efficacy Scale, a subscale of the Self-Efficacy Scale (SES; Sherer et al., 1982). Both Maitland et al. (2010) and Richman et al. (2014) measured self-determination using the Self-Determination Student Scale (S-DSS; Hoffman, Field, & Sawilowsky, 2004). Other variables in the “Self-esteem, well-being, and quality of life” category included life satisfaction, well-being, self-esteem, and psychological distress. Maitland et al. (2010) measured life satisfaction with the Authentic Happiness Inventory (Peterson, 2004). Field et al. (2010a, 2013) measured well-being using a 10-item College Well-Being Scale (CWB; Field, Parker, Sawilowsky, & Rolands, 2010b). Prevatt and Yelland’s (2015) study measured self-esteem with the Rosenberg Self-Esteem Inventory (RSE; Rosenberg, 1965), a 10-item scale assessing global self-esteem; they measured psychological distress using the Outcome Questionnaire-45 (OQ-45; Lambert & Finch, 1999), a 45-item tool typically used as a repeated measure of client psychological distress over time in therapy.

Satisfaction with coaching. Four of the studies using qualitative approaches identified satisfaction with coaching among college students.

Research Question (6): Describe in detail the research on ADHD coaching, in particular, the research among college students.

The research on ADHD coaching for children/adolescents and adults is briefly presented here; it is reviewed in greater detail elsewhere (Ahmann et al., 2017). The research on ADHD coaching for college students is reviewed in detail herein. Details of all 19 studies appear in Tables 1, 4, and 5. Additionally, Table 3, and a separate section below, incorporate one study only addressing between-session assignments (Prevatt et al., 2011), for a total of 20 studies.

Children/adolescents and adults. Two studies examined outcomes of peer coaching for elementary students with ADHD, using the Dawson and Guare (2000, 2012) executive skills coaching model, and focusing on social and behavioral outcomes (Plumer & Stoner, 2005; Vilardo et al., 2013).

Five studies reported to date examined trained coaches working with children or teens with ADHD (Ahmann et al., in press). A prospective descriptive study examined the impact—on behavior and fam-

ily quality of life—of five monthly group coaching sessions for 49 children with ADHD, as part of multimodal treatment (Garcia Ron et al., 2016). In two small studies ($n = 5$ and $n = 3$, respectively), school personnel used Dawson and Guare’s coaching model to examine academic outcomes for teens (Dawson & Guare, 2012; Merriman & Coddington, 2008). Evans et al. (2014) conducted a larger (24 participants with ADHD; 12 community controls), randomized controlled study of effectiveness and dose response of an intervention comprised of coaching for teens as well as an interpersonal skills group and parent training. Outcomes included academic, social, and familial factors. Wentz et al. (2012) conducted a small quantitative and qualitative longitudinal study among 10 teens and young adults (ages 15-26 years) to validate a model of Internet-based support and coaching for adolescents and young adults with ADHD, Asperger’s syndrome, or pervasive developmental disorder not otherwise specified.

Only two studies to date have examined ADHD coaching for adults, both employing a group approach rather than individual coaching. Bloemen, Verbeeck, and Tuinier (2007) conducted a prospective study of 10 adults, meeting the DSM-IV criteria for ADHD, participating in an eight-week group coaching program. Kubik (2010) examined group coaching in a prospective study, with additional quantitative components, of 45 adults, diagnosed with or strongly suspected of having ADHD; 22 areas of concern, comprising five factors, were examined—cognitive, distractibility, social, inattentive, and behavioral concerns (Kubik, 2010).

College students. One study of coaching for college students used a peer coaching model: Zwart and Kallemeyn (2001) conducted a quasi-experimental study, including a matched-pairs analysis, with 22 college students having ADHD, some also having learning disabilities (LD). Coached students demonstrated pretest to posttest improvements in self-efficacy and on all subscales of the LASSI. An initial analysis compared pretest to posttest change scores of coached students to those of a control group of 20 students, some of whom only had LD and not ADHD, finding some differences between the groups. For a subsequent analysis, an adjusted control group ($n = 11$) was formed with students more similar to the coached group, in that they had only ADHD or ADHD and LD but not only LD; results changed somewhat (e.g., pre- to posttest changes in self-efficacy were no longer significant although pre- to posttest changes in five of the six LASSI subscales remained significant, excepting only Attitude). Finally, a matched pairs analysis demonstrated that the coached students had

significant ($p < .05$) improvement on eight subscales of the LASSI, excepting only Attitude and Information Processing. In contrast, the adjusted comparison group ($n = 11$) only had significant improvement in two subscales: Concentration and Self Testing.

Nine studies examined the impact of coaching with “trained coaches” (non-peer) for college students with ADHD; two of these studies also included some graduate students. An additional study specifically examined the use of BSAs when coaching college students (Prevatt et al., 2011).

Swartz et al. (2005) described a coaching program and reported a case study, with pretest and posttest data, of an individual whose ADHD diagnosis was determined by a licensed professional. Pre- to post-intervention improvement occurred in four of seven self-selected goals, with no change in one goal and a decrease in two; scores on the LASSI improved.

Reaser (2008) reported on coaching (using the approach of Swartz et al., 2005) for a convenience sample of seven college and graduate students “previously diagnosed with ADHD” (p. 31). This qualitative case series, following the methods of Yin (1993, 1994), included a quantitative pretest–posttest component in which students each demonstrated improvement on at least six of 10 LASSI subscales. Based on questionnaires and interviews with the researcher, students also reported positive gains in outlook, organization, self-awareness, and self-control; most students identified coaching as being more helpful than other ADHD treatment approaches and wished that the intervention had continued longer.

Parker and Boutelle (2009) conducted a phenomenological study involving a purposive sample of seven students at Landmark College (a school focused specifically on students with ADHD and LD). One student had math-based LD but not ADHD; the others had ADHD diagnoses, though the method of diagnosis was not described. After 10 weekly coaching sessions, students participated in two separate hour-long interviews about their coaching experience; one student completed just one interview. Three types of qualitative analysis on the interview transcripts uncovered key themes in students’ experiences of coaching, including: changes in thinking and behavior, development of competencies for goal attainment, enhancement of well-being, and a positive sense of the future. The researchers also reported: “students’ overall experiences with coaching were extremely positive” (p. 215).

The Maitland et al. (2010) mixed-methods study used a purposive sample of six students having ADHD (three also having LDs; method of ascertaining ADHD not described). Quantitative findings in-

cluded a non-significant trend ($p = .059$) toward an increase in self-determination as well as non-significant increases in EF skills and life satisfaction. An analysis of hour-long interviews with each student found increases in the same three domains, as well as increased confidence about future success.

Parker et al. (2011) also reported a mixed-methods design with seven college students having ADHD (determined by their eligibility for college accommodations for the diagnosis). From pre- to post-intervention, coached students in this study showed improvements in grades (GPA) and “substantial” mean gains in the Self-Regulation subscale of the LASSI. When interviewed about their coaching experiences, students reported that coaching contributed to improved “goal attainment skills . . . a greater sense of well being and self-regulation;” and that they “enjoyed working with coaches, whom they found to be effective and supportive” (p. 115).

Richman et al. (2014) examined the impact of coaching on self-determination, executive functioning, and academic skills in a self-selected convenience sample of undergraduate and graduate students with ADHD/LD, determined based on eligibility for LD/ADHD services in a university disability office. Although quantitative results were not significant, “all intervention group students improved in every posttest measure and, except in one case, to a greater extent than the comparison group” (Richman et al., 2014, p. 39). Thematic analysis of interviews, based on 12 specific questions, explored the impact of coaching on the quantitative outcome variables, also identifying student views of benefits and limitations of coaching, described in the discussion section below.

Prevatt and Yelland (2015) examined ADHD coaching using an EF-focused, CBT- and psychoeducationally-oriented approach for coaching (modeled after Swartz et al., 2005) for students self-reporting ADHD in a descriptive prospective study with a correlational component. Coaching was complemented by between-session check-ins as needed. “With the exception of the OQ-45 (outcome questionnaire) subscale for interpersonal relations,” the results indicated significant pre- to post-treatment effects for all variables studied ($p < .01$) (Prevatt & Yelland, 2015, p. 670): reductions in distress ($p < .01$); improvements in self-esteem ($p < .01$); improvements in learning and study strategies (each of the 10 subscales of the LASSI had $p < .01$; Cohen’s d values ranged from 0.40 to 0.89); and improved satisfaction with school ($p < .01$; $d = 0.83$). For the LASSI, the largest effect sizes were found for Time Management ($d = 0.89$) and Concentration ($d = 0.76$), important EF skills for students with ADHD. Correlates of positive change

on various study measures were also examined, suggesting, in part, that clients with higher initial motivation, less comorbid anxiety and depression, and lower self-rated symptoms of ADHD, may derive a greater range of benefits from coaching.

Field et al. (2013) conducted a randomized controlled study of coaching, using the Edge/JST model, on 10 college campuses, with students whose ADHD was determined by their eligibility to receive accommodations at school based on submitted documentation. Students who received coaching demonstrated significantly improved EF from pretest to posttest, as measured by total scores on the LASSI ($p < .01$; effect size $d = 1.02$), and also improvements in Will, Skill, and Self-Regulation, as measured by the LASSI's clusters of subscales (see description above), with moderate to large effect sizes ($p < .01$ for each; $d = 0.65, 0.88$, and 1.10 , respectively). Comparison subjects did not show similar gains. Additionally, controlling for the pretest LASSI scores as a measure of EF in analysis, coached students, as compared to non-coached controls, demonstrated significantly higher total ($p = .048$) and subscale ($p < .05$ for each) scores in executive functioning on the LASSI with moderate to large effect sizes (Partial Eta² of 0.05 for Will; 0.04 for Skill; and 0.08 for Self-Regulation), as well as higher post-intervention well-being scores on the CWB ($p = .05$). Of note, no statistically significant differences were found in outcomes—with the exception of the LASSI Self-Regulation subscale posttest scores—between study participants self-identifying as having ADHD only or ADHD and at least one other condition: “depression, anxiety, learning disability, Obsessive Compulsive Disorder, Oppositional Defiant Disorder, Tourette’s Syndrome, Asperger’s/Autism, or Bi-polar Disorder” (p. 77).

Individual interviews were conducted with a purposive sample of the coached students ($n = 19$) for a qualitative component of the Field et al. (2010a, 2013) study, reported by Parker et al. (2013). These 19 students reported that coaching helped with numerous aspects of goal-directed behavior and attainment, meeting needs not addressed by other providers, including (a) designing more effective goals; (b) developing better coping strategies, including persistence and self-regulation; (c) working more productively; and (d) achieving “more positive outcomes” (pp. 222, 226). Based on analysis of themes in the interviews, artifacts students shared with researchers, and quantitative data, four main benefits to coaching were identified: (a) promotion of self-regulation; (b) assistance in developing productive beliefs; (c) a “unique and caring partnership”; and (d) “enhanced . . . positive feelings” (p. 226).

Between-session assignments among college students. To date, two studies of ADHD coaching for college students have examined in detail one specific strategy used in the coaching process: BSAs, which are individualized and may include activities such as purchasing a planner, scheduling daily study times, or gathering articles for a research paper. Prevatt et al. (2011), using the coaching model of Swartz et al. (2005) and the BSA approach of Dawson and Guare (2000), examined the use of BSAs in relation to factors including compliance, usefulness, and benefit for 13 college students with a “prior diagnosis of ADHD” (p. 20). Coaches rated student attitudes toward BSAs (mean rating of 4.8 on a Likert scale where 1 = *extremely negative* to 7 = *extremely positive*) and compliance with BSAs (a mean rating of 4, with a range of 2 to 7, where 1 = *never complete* and 7 = *always complete*). Coaches also rated the utility of the BSAs in helping students deal with problem areas (mean rating of 5.17 where 1 = *not at all useful* and 7 = *very useful*). Students were not more likely to comply with written than oral BSAs, but written instructions were correlated with greater time spent on the assignments ($r = .71, p < .01$). Coach ratings of overall client progress were positively correlated with their ratings of student positive attitudes toward the BSAs ($r = .84, p < .01$). Prevatt and Yelland (2015) examined this issue again, as part of a larger study of coaching outcomes (described above), finding that when coaches gave higher ratings of client compliance with, time spent on, and/or quality of the BSA, clients showed more positive changes on anxiety, concentration, selecting main ideas, and test strategies.

Summary and Discussion

ADHD coaching emerged as new field in the 1990s (Wright, 2014). Since most coaches—as well as current ADHD coach training programs—are not associated with university, hospital, or other health care settings, research on ADHD coaching has only begun to emerge more recently. We were thus encouraged to have identified 19 studies on ADHD coaching outcomes, 16 of which have been published in peer reviewed journals. Ten of these studies examined ADHD coaching for college students.

Study Designs

The studies exploring ADHD coaching outcomes comprised a combination of qualitative and quantitative approaches, with varied study designs, including two randomized controlled trials (see Table 1). The studies of coaching for college students ranged from a case study to a randomized controlled trial. Extant

studies were mostly quite small in size and lacked control groups. Additionally, only two randomized controlled trials of ADHD coaching, one with high school and one with college students, have been conducted to date (Evans et al., 2014; Field et al., 2010a, 2013). The varied extant literature is interesting in that beneficial outcomes of ADHD coaching, for managing ADHD and EF symptoms, as well as other positive outcomes (Table 5), are fairly consistently demonstrated across a wide range of study designs. Although existing studies uniformly found beneficial outcomes of ADHD coaching, larger sample sizes and the use of control groups, including randomization, would strengthen conclusions that can be drawn from this body of research.

Participant Characteristics

The 19 studies on ADHD coaching outcomes variously examined coaching for elementary and high school students, college students, and adults. Studies of ADHD coaching to date were inconsistent in the way an ADHD diagnosis was established (see Table 2). ADHD subtypes/presentations and use of medication were infrequently and inconsistently reported despite the possibility that both are potentially confounding factors (see Kubik, 2010). In one study, self-identified symptom severity impacted coaching outcomes (Prevatt & Yelland, 2015). Greater consistency in diagnostic approach and reporting of ADHD presentation, symptom severity, and medication use would undoubtedly improve future research.

Comorbid conditions were not always examined in extant studies. In fact, although Zwart and Kallemeyn's (2001) results suggest that co-occurring LD may confound the relationship of ADHD and coaching outcomes, several studies examined coaching for students with ADHD and comorbid LD without examining such potential confounding. Depression and anxiety are other commonly occurring comorbidities with ADHD. While Prevatt and Yelland (2015) found that lower initial levels of depression and/or anxiety among students were associated with higher levels of benefit from coaching, Field et al. (2013) found no effect of co-occurring conditions on outcomes of coaching, except on the post-coaching Self-Regulation cluster score on the LASSI. The impact of comorbidities on the success of coaching is unresolved and deserves further research attention.

Further, findings in several studies to date (see Table 3) suggest that it may be important for future research to identify and possibly control for—if not examine the impact of—concurrent use of therapy, tutoring, and other related services, in examining coaching outcomes. Whether socioeconomic factors

play a role in coaching success has received almost no attention; but Evans et al. (2014) examined selected socioeconomic variables, finding that controlling for maternal education, but not paternal education or family income, influenced outcomes. These factors deserve further research attention as well.

A few of the studies of coaching for individuals with ADHD document that not all individuals who begin a coaching program complete it (e.g., Field et al., 2013; Prevatt & Yelland, 2013). Since EF challenges directly impact follow-through, this challenge is not unique to coaching, but occurs with any treatment modality for ADHD, including medication, CBT and others. Prevatt (2016) specifically described the importance of screening students for “suitability” for ADHD coaching, as well as evaluating a student's level of motivation before “accepting them for ADHD coaching” (pp. 110-111). Future research might examine differences between individuals who do and do not stick with coaching and investigate related factors, such as level of motivation and readiness to make use of coaching.

Characteristics of Coaching Programs

Coaching has always drawn on a rich theoretical base (Cox, Bachkirova, & Clutterbuck, 2014; Stober & Grant, 2006; Wildflower & Brennan, 2011). We were thus interested to examine the conceptual frameworks that may have been employed in the identified studies and the coaching programs investigated. It was no surprise that, of the six frameworks identified, a majority of the studies endorsed an executive functioning framework, which provides the basis for much of the work of ADHD coaching.

The various characteristics descriptive of the ADHD coaching process in the studies reviewed are similar to those examined in a systematic review of health and wellness coaching (Wolever et al., 2013). These include group or individual coaching; coaching models; coach training; length of individual coaching sessions; and the frequency and duration of the coaching program. Three of the 19 ADHD coaching outcome studies examined coaching for children; two used peer coaches and one examined group coaching, all models potentially useful in school settings. Three studies looked at coaching for teens with ADHD, with one additional study including both teens and young adults; none of these examined a group coaching model, although coaching in a group might make sense for teens, both due to peer influence and the potential cost-effectiveness in a school setting. Only two studies to date have examined coaching for adults with ADHD, both examining group rather than individual coaching, and demonstrating posi-

tive outcomes; in actuality, however, many adults are coached individually. No research examined group coaching for college students, a potentially cost-effective model as compared to individual coaching. Group coaching might have certain benefits, such as peer support, but also certain drawbacks for this age group, including less ability to effectively target individual needs. While several of the studies of coaching for children and teens examined peer coaching, only one study of coaching for college students used peers as coaches. If additional research were to find peer coaching for college students to have similar benefits to that demonstrated with informally trained or formally trained and certified coaches, costs to clients or educational institutions might be lower.

While three of 19 extant studies examined the use of peer coaching, the 16 studies examining outcomes with trained coaches utilized various definitions of what comprised an “ADHD coach,” including differing approaches to coach training (Table 4), and the use of varied models (e.g., Dawson & Guare, 2000, 2012; Swartz et al., 2005; Edge/JST, described in Field et al., 2010a). It is interesting to note that positive outcomes were demonstrated across this range of coaching approaches and models. No comparison has been made of coaching with differing approaches (e.g., peer vs. “trained coach”), differing types of coach training, or differing coaching models. However, select aspects of coaching programs have been shown to impact outcomes: BSAs, as discussed herein, as well as incentives, consequences, and other factors as detailed in Prevatt et al. (2017). Clearly, future studies should explicitly describe coach training and the coaching approach and model used. At some point, research comparing these variables might also be useful.

With the exception of one study (Zwart & Kallemeyn, 2001), college students received at least eight, and as many as 24, weekly sessions of ADHD coaching (Table 4). Evans et al. (2014), studying coaching for teens with ADHD, explored a coaching dosage effect on selected outcomes, an important factor deserving more study in all age groups, and certainly among college students with their otherwise busy schedules. Dosage effects might also elucidate varying impacts over time. As a related matter, three studies of coaching, but none among college students, explored maintenance of gains over time. Longitudinal designs in future studies would contribute to understanding both dosage effects and the extent to which gains made in a coaching program are maintained over time (Ramsey, 2010).

Three studies (Maitland et al., 2010; Parker & Boutelle, 2009; and Richman et al., 2014) included interviews with small numbers of students (ns six,

seven, and six, respectively) about limitations they experienced in coaching services provided, mostly related to a broadening of the coaching role. Some students reported feeling that it would be better if coaching were more accessible and appointments were longer or more frequent; others wished that coaches had more of a long-term orientation, such as knowing more about graduate programs or more directly addressing post-college planning (Maitland et al., 2010; Richman et al., 2014); and some wished that coaches had more directly taught them study skills, more typically the role of a tutor, but a role that some coaches incorporate into their work (Maitland et al., 2010; Parker & Boutelle, 2009; Richman et al., 2014). These findings may suggest additional avenues of exploration for future research.

Outcomes

Rabiner (2014) suggested that one criticism of the coaching research to date is that only one study has examined the impact of coaching on GPA, and none has examined the impact on number of credits earned in a semester. (DuPaul, Dahlstrom-Hakki, Gormley, & Banerjee [2017, abstract] suggest that coaching has a positive impact on GPA for students with ADHD; full study not available at time of manuscript submission.) These variables could be explored in future research; additionally, the duration of coaching required to support these outcomes could be explored. Nonetheless, “ADHD and EF symptoms” was the study outcome most commonly studied in extant coaching research, and studies consistently demonstrated improvements in these symptoms as a result of coaching. Improvement in these key symptoms is unquestionably of substantial benefit to individuals with ADHD, easing functioning in many life domains. Among the domains likely impacted by improvements in ADHD and EF symptoms is student success in college, as indicated by GPA improvements examined in one study.

Also examined in the extant research, self-esteem, well-being, and quality of life are other important outcomes impacting individuals with ADHD (Weiss, 2017). In fact, Rabiner (2014) has suggested: “The fact that students [in coaching studies] reported feelings of increased well-being and confidence [is]...important and compelling in its own right” (para. 22). If additional future studies were to include measures addressing such outcomes, the breadth of impact of coaching in supporting a wider range of functional improvements for individuals with ADHD would be elucidated.

Functional impairment is receiving increasing attention as an important aspect of ADHD (Epstein & Weiss, 2012; Sjöwall & Thorell, 2014; Soendergaard

et al., 2015; Weiss, 2017). Both functional impairment and adaptive functioning may be other confounding factors to examine and/or outcomes worth measuring in future research. One study of coaching for college students used the Life Participation Scale-Adult, considered a measure of adaptive functioning (Saylor et al., 2007). Additionally, The LASSI was a common measure of EF outcomes used in studies of coaching for college students, and might be considered a reasonable measure of functional impairment related to academics. Other measures, such as the Behavior Rating Inventory of Executive Functions-Adult Version, used in one study among college students, or the Barkley Deficits in Executive Functioning Scale (BDEFS; Barkley, 2011), might examine EF more broadly and could allow easier comparison to the examination of EF in other types of research.

Additionally, while “objective” outcome measures of coaching were used in several studies (e.g., grades, behavioral observations, and teacher, parental or spousal reports) most research on ADHD coaching, including that among college students, has used participant self-report on measures such as the LASSI, the S-DSS and others. While most studies used valid, reliable scales, the future use of outcome measures that do not rely solely on participant self-report might corroborate and strengthen study findings (c.f. Bloeman et al., 2007; Swartz et al., 2005).

A number of studies explored subjective views, in small numbers of participants (study ns ranging from six to 19), of the benefits of working with a coach: college student participants cited improvements in arenas such as decision-making and goal attainment; self-awareness; productive beliefs; management of non-clinical levels of stress or anxiety; and both optimism and quality of life (Maitland et al., 2010; Parker & Boutelle, 2009; Parker et al., 2013; Parker, et al., 2011; Richman et al., 2014; see also Deal et al., 2015). Findings from several studies of college students and adults also suggest that participants endorse coaching as a unique partnership meeting needs not adequately addressed by other personal or professional relationships, including academic advising, tutoring, or therapy (Kubik, 2010; Parker et al., 2013; Parker et al., 2011). Reaser (2008), offering an eight-session coaching intervention, found that students wished more sessions had been offered. Nine studies, among children and college students, also report participant expressions of high satisfaction with coaching (see Table 5). These qualitative findings add texture and support to the quantitative reports of beneficial outcomes of ADHD coaching.

Implications

Research has demonstrated that students with ADHD often face a difficult adjustment to college and are less likely to graduate. Data from the National Longitudinal Transition Study-2 (NLTS-2; Newman et al., 2011) indicated that students with disabilities, including ADHD (or “other health impairment”), are going to college in greater numbers and, yet, are significantly less likely to seek accommodations in college than in high school (only 28% do so). This may be due, at least in part, to stigma concerns (Kranke, Jackson, Taylor, Anderson-Fye, & Floersch, 2013). (It is interesting to note that some coaching programs, through educating students about ADHD, are able to directly address the issue of (self-)stigma; see Goudreau & Knight, 2015). Newman et al. (2011) report that 25%, of students, or fewer, receiving supports in high school received accommodations in college. Additionally, a study among first year college students with and without ADHD, found that ADHD did not predict higher use of services on campus (Gormley, DuPaul, Weyandt, & Anastopoulos, 2016).

It also seems apparent that challenges faced by students with ADHD in higher education are not being adequately met by current support services, even for those who do receive them. According to the NLTS-2, 12% of students receiving support in postsecondary settings rated the assistance as “not very” or “not at all adequate,” and an additional 33% rated these supports as only “somewhat useful” (Newman et al., 2011, p. 36). Gormley et al. (2016) examined predictors of academic performance and found that typically available academic services were not independently related to GPA for students with ADHD. Other studies have also suggested that various common accommodations are “either ineffective or equivocal” (Gormley et al., 2016, p. 2). For example, DuPaul et al. (2017) found that tutoring did not significantly impact the GPA of students with ADHD. Additionally, the NLTS-2 reported that 34%-40% of postsecondary students considered to have disabilities in high school sought help outside of that available in their current settings (Newman et al., 2011). Reports of higher rates of class withdrawal and probation, as well as lower likelihood of graduation than typically developing peers, also point to inadequate support.

Given both the growing number of college students with ADHD/EF issues, and the suggestion in the literature that currently existing support services may not be adequate, the emerging body of research demonstrating the potential effectiveness of coaching as a support for student success may be of interest to institutes of higher education. In fact, the research

on ADHD coaching suggests that, whether alone or as part of a broader service-delivery model, coaching may be a useful adjunct to current services in that it promotes student executive functioning and related academic skills (and GPA in one study), as well as bolsters self-esteem and supports well-being. In this way, ADHD coaching may be an effective approach for improving motivation, academic skills, self-efficacy, achievement, persistence, and, ultimately, retention among college students with ADHD (see, e.g., Robbins et al., 2003; Robbins et al., 2004; Tinto, 1975, 1993).

While it seems likely that coaching may augment other valued and evidence-based practices in supporting students with ADHD, such as the use of accommodations, assistive technology, writing centers, tutoring, and mental health counseling, little research to date has directly explored the role that various of these factors play, individually or in concert, in promoting student success (see Gormley et al., 2016). Future research might beneficially examine these questions. Although future research might also specifically explore more directly the impact of coaching on retention, it seems reasonable to hypothesize that any improvements found in student executive functioning and well-being might ultimately have a positive impact on retention.

As discussed in Newman et al. (2011), some 45% of students in postsecondary settings are at least somewhat dissatisfied with the support services available on campus, and some 34% to 40% seek supports outside of their academic settings; this suggests that students recognize the need for support even if they are not seeking or finding it in their schools, and even if stigma is a concern. In this regard, it is interesting to note that coaching is generally understood to be a “wellness model” as it focuses more on self-awareness, empowerment, self-determination, and the development of skills and strategies than do most other models of service delivery and support. In fact, ADHD coaching closely parallels health and wellness coaching in its definition and approach (see Wolever et al., 2013). It could be hypothesized that the emergence of a “wellness” model such as ADHD coaching might offer college administrators a new tool for promoting retention that more students with disabilities might find less stigmatizing. In fact, in this vein, a recent study in the Netherlands found that adults with ADHD prefer coaching, even with its out-of-pocket costs, over public mental health care (Schrevel, Dedding, & Bourse, 2016).

ADHD coaching originally developed as a private-practice model. One approach supporting student access to ADHD coaching in the private sector is

for an educational institution to develop a referral lists to coaches in its geographic locale. As an example of this latter approach, the first author of this study is on a referral list at several local institutions. In fact, the research conducted by Parker et al. (2011), Field et al. (2010a, 2013), and Parker et al. (2013) was based on a private-practice model, with coaches often at a geographic distance from students. Since coaching is often conducted by telephone or video-conferencing, geographic proximity is not required.

The evolution and integration of other evidence-based practices for students with disabilities, such as the Strategic Instruction Model (SIM)TM (see e.g., Deschler & Lenz, 1989; Strategic Instruction Model, n.d.) may suggest approaches for integrating ADHD coaching as a service offered directly in varied educational settings. In fact, Prevatt (2016) reviewed several programs similar to a combination of strategic instruction and coaching. At the same time, ADHD coaching is a model of student support that some higher education settings have already begun to integrate as part of on-campus services (Parker et al., 2011). For example, Landmark College, a two-year college focused on students with ADHD and LDs, has had an EF coaching program in place since 2004, available to all students as part of their tuition fees (Parker & Boutelle, 2009). Students in this program typically “choose to work on organization, time management, timely work completion, stress management, and academic/personal life balance” (p. 206). DuPaul et al. (2017) found that among students receiving coaching at a college targeting students with ADHD and/or LDs, and making coaching readily available, it is “students with ADHD who obtain the greatest gains in GPA” (abstract). Lynn University’s Institute for Achievement and Learning has developed an executive functioning-oriented coaching program that assists students with ADHD (and/or learning disabilities) during their first year of college to improve their ability to manage the often-challenging transition from high school to college (Goudreau & Knight, 2015). A separate model, proposed and tested with five students at a college “that exclusively serves students with learning disabilities, ADHD, and autism spectrum disorder” involves a coaching approach to academic advising: “integrating intrusive advising practices with components of ADHD coaching” (D’Alessio & Banerjee, 2016, p. 113).

To provide access for students with ADHD, higher educational institutions could consider a variety of approaches, such as any of the following: obtaining ADHD coach training for disability services staff, or others (c.f., D’Alessio & Banerjee, 2016); hiring trained, certified ADHD coaches; and/or developing

referral list of trained, certified ADHD coaches. In addition, postsecondary settings incorporating any of these models of providing coaching services to students could contribute to the field by conducting informal or formal research on the impact of coaching on student outcomes to share with the field through journals, through conferences, or even informally in newsletters or list-serve discussions.

Conclusions

To provide the most comprehensive possible review of the research on outcomes of ADHD coaching, we chose to include studies from peer-reviewed journals, which comprised 16 of the studies reviewed, as well as three studies from what is typically called grey literature (i.e., a book and both a conference presentation and a dissertation identified through a generic Google search). While some may consider inclusion of grey literature in a review a limitation, due to concerns that it is not peer-reviewed and may be of lower methodological quality, grey literature can be an important source in a comprehensive review. In fact, it may demonstrate a lower intervention effect than do published studies (Hopewell, McDonald, Clark, & Egger, 2007) and may mitigate to some extent concerns related to publication bias (Gopalakrishnan & Ganeshkumar, 2013). Perhaps for these reasons, acceptance of including grey literature in systematic reviews has increased (Tetzlaff, Moher, Pham, & Altman, 2006).

A meta-analysis combining data from studies, and following guidelines such as PRISMA (Moher, Liberati, Tetzlaff, & Altman, 2009), is a stronger study design than a descriptive review. However, since the extant research literature on ADHD coaching included only two randomized controlled trials, and the 10 studies on coaching for college students included two purely qualitative studies and five studies with fewer than ten intervention subjects, we did not consider a meta-analysis of the ADHD coaching literature, or the use of pooled estimates, appropriate. At the same time, a review of the literature to date seemed timely and useful. While many narrative reviews introduce bias by their focus on a subset of the literature in a given subject area, this review is more consistent with a systematic review in that it is comprehensive (Uman, 2011), although the research was not systematically evaluated based on its methodological quality or on individual study sources of bias. We simply summarized results and presented the key points of each paper.

To be comprehensive and systematic, we included in this review studies with varied designs; varied population ages; varied methods of ADHD diagnosis in

participants; varied outcome variables and approaches to measurement; and even sample sizes as small as one (a case study). In any comprehensive review, heterogeneity in samples and variables examined can create a problem for comparison of results (Gopalakrishnan & Ganeshkumar, 2013). In this review, integrating findings from quantitative and qualitative studies is one such concern. However, the fact that varied study designs point to similar conclusions in this body of research may add credibility to the fairly consistent findings in these studies. At the same time, while we suggest directions in the evidence provided by the reviewed studies, generally small sample sizes limit the strength of conclusions that can be drawn.

An additional limitation of this study concerns the fact that three of the four authors of this review are ADHD coaches, possibly introducing unintentional bias into the interpretation of the literature.

Future research on ADHD coaching will benefit from improved methodological approaches, including use of control groups and randomization, longitudinal designs, and setting more stringent inclusion/exclusion criteria, including reliable, replicable approaches to identification of ADHD. As suggested by Tables 2 and 3, future studies may also target emerging questions regarding the impact of additional potentially confounding variables on coaching outcomes, through data collection, reporting, and analysis. Future research may also shed further light on ADHD coaching efficacy among college students, and other age groups, and could begin to look more specifically at factors supporting the impact of coaching on student success. Retention could also be directly investigated in future ADHD coaching research.

Limitations evident in the extant body of literature notwithstanding, research to date consistently suggests that ADHD coaching supports improved outcomes in varied realms of ADHD and EF symptoms, as well as in well-being. This is true across varied types of study designs; across both peer and “trained coach” approaches; across several individual coaching models, and also in group coaching; and not only among college students, but across varied age groups. For these reasons, ADHD coaching appears to be a useful and valued service deserving increased attention as part of a multimodal treatment approach for individuals with ADHD. The 10 studies that focused on coaching and college students clearly suggest that ADHD coaching may not only be a useful aspect of multimodal treatment, but also a valuable and effective student support service for colleges and universities to explore.

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Table 1

ADHD Coaching Outcome Studies by Age Group, Number of Participants, and Research Design

Age Group	Number of Participants	Research Design	Study
Elementary Students	49	Prospective descriptive	Garcia Ron et al. (2016)
	4	Multiple baseline across-participant	Vilardo et al. (2013)
	3	Multiple baseline across-participant	Plumer & Stoner (2005)
High School Students	24 intervention; 12 comparison	Randomized controlled trial (with dosage analysis)	Evans et al. (2014)
	5	Case series	Dawson & Guare (2012)
	3	Multiple baseline across-participant	Merriman & Coddington (2008)
Teens & Young Adults	10	Longitudinal mixed method	Wentz et al. (2012)
College Students	148	Prospective descriptive (with correlational component)	Prevatt & Yelland (2015)
	88 intervention; 39 comparison	Randomized controlled trial	Field et al. (2013)
	22 intervention; 20 comparison (11 adj. comparison)	Quasi-experimental	Zwart & Kallemeyn (2001)
	19	Qualitative	Parker et al (2013)
	16 intervention; 8 comparison	Mixed method (with non-equivalent comparison group)	Richman et al. (2014)
	7	Mixed method with prospective component	Parker et al. (2011)
	7	Qualitative case series (with quantitative prospective component)	Reaser (2008)
	7	Phenomenological	Parker & Boutelle (2009)
	6	Mixed method with prospective component	Maitland et al. (2010)
	1	Case study (with quantitative prospective component)	Swartz et al. (2005)
Adults	45	Prospective (with additional quantitative components)	Kubik (2010)
	10	Prospective	Bloemen et al. (2007)

Table 2

Methods of Establishing an ADHD Diagnosis in Reviewed Studies of ADHD Coaching

Diagnostic Approach	Number of Studies
Submission of documentation to a university office for disability services of: ADHD (3 studies) or ADHD and/or learning disability (2 studies)	5
DSM-IV diagnosis	4
Physician's report and multiple rating scales	2
Self-reported prior diagnosis	2
Diagnosis from a licensed professional	1
Physician diagnosis or personal strong suspicion of having ADHD	1
Caregiver report on a structured interview or use of a teacher rating scale	1
Exhibition of symptoms in the classroom	1
Not reported	2

Table 3

Factors Potentially Related to Coaching Success

Factor	Number of Studies	Studies
Presence of comorbidities (varied findings)	4	Field et al. (2013); Garcia Ron et al. (2016); Prevatt & Yelland (2015); Zwart & Kallemeyn (2001)
Concurrent use of tutoring or therapy	4	Field et al. (2013); Parker et al. (2013); Parker et al. (2011); Kubik (2010)
ADHD subtype; symptom severity	2	Kubik (2010); Prevatt & Yelland (2015)
Use of/time spent on between-session assignments	1	Prevatt & Yelland (2015)
Initial level of client motivation	1	Prevatt & Yelland (2015)
Medication use	1	Kubik (2010)
Socioeconomic factors (e.g. maternal education)	1	Evans et al. (2014)

Note. Prevatt et al. (2011), not one of the 19 outcome studies examined, also found between session assignments to be an important factor in coaching success.

Table 4

Characteristics of ADHD Coaching Programs by Age Group, Type, Training, Frequency, and Study

Age Group	Type	Coach Training	Duration (Frequency)	Study
Elementary Students	Group	Formally trained coaches	5 sessions (monthly)	Garcia Ron et al. (2016)
	Individual	Peer coaches	18 + weeks (daily)	Vilardo et al. (2013)
	Individual	Peer coaches	12 weeks (3 days/week)	Plumer & Stoner (2005)
High School Students	Individual	Former teachers ^a	Avg. ~27 sessions (weekly)	Evans et al. (2014)
	Individual	School personnel (non-psychologist) ^a	Two marking periods (daily)	Dawson & Guare (2012)
	Individual	School psychologists ^a	~3 weeks (daily, with systematic fading)	Merriman & Coddington (2008)
Teens & Young Adults	Individual	Clinical psychologist and educational therapist ^a	8 weeks (2 face-to-face and up to 14 Internet sessions, twice weekly)	Wentz et al. (2012)
College Students	Individual	Doctoral-level practicum students in psychology ^a	8 sessions (weekly)	Prevatt & Yelland (2015)
	Individual	Formally trained coaches	12-24 sessions (weekly over 2 semesters)	Richman et al. (2014)
	Individual	Formally trained coaches	Avg. 17-18 sessions (weekly)	Field et al. (2013)
	Individual	Formally trained coaches	Avg. 17-18 sessions (weekly)	Parker et al. (2013)
	Individual	Formally trained coaches	Semester (weekly)	Parker et al. (2011)
	Individual	Formally trained coaches	8-13 sessions (weekly in one semester)	Maitland et al. (2010)
	Individual	Formally trained coaches	10 sessions (weekly)	Parker & Boutelle (2009)
	Individual	Doctoral-level psychology student ^a	9 sessions (weekly)	Reaser (2008)
	Individual	Doctoral-level psychology student ^a	8 sessions (weekly)	Swartz et al. (2005)
	Individual	Peer coaches	2-10 sessions (weekly, in one semester)	Zwart & Kallemeyn (2001)
	Group	Formally trained coach	7 sessions (6 weekly, 1 follow-up 1 month later)	Kubik (2010)
Adults	Group	Training not specified	8 sessions (weekly)	Bloemen et al. (2007)

Note. Formally trained coaches were also certified by training organization and/or the International Coaching Federation. ^aSpecified individuals were informally trained in using coaching approaches

Table 5

ADHD Coaching Outcomes and Associated Variables

Outcome Category	Outcomes	Studies
ADHD/EF symptoms and related behaviors (19 studies)	Improved social behaviors	Evans et al. (2014); Plumer & Stoner (2005); Vilardo et al. (2013)
	Improved grades	Dawson & Guare (2012); Merriman & Coddling (2008); Parker et al. (2011)
	Pretest–posttest clinical, symptom, or functional improvement	Bloemen et al. (2007); Evans et al. (2014); Garcia Ron et al. (2016); Kubik (2010); Wentz et al. (2012)
	Qualitative reports of improvement in executive functioning skills and/or goal attainment	Maitland et al. (2010); Parker & Boutelle (2009); Parker et al. (2013); Parker et al. (2011); Reaser (2008); Richman et al. (2014) Swartz et al. (2005)
	Pretest–posttest improvement and greater improvement than a comparison group in total and/or multiple subscale scores on the LASSI	Field et al. (2013); Parker et al. (2013); Parker et al. (2011); Prevatt & Yelland (2015); Reaser (2008); Richman et al. (2014); Swartz et al. (2005); Zwart & Kallemeyn (2001)
Self-esteem, self-efficacy, well-being, quality of life (9 studies)	Pretest-posttest improvements in self-esteem or self-efficacy	Prevatt & Yelland (2015); Wentz et al. (2012); Zwart & Kallemeyn (2001)
	Quantitative measures and qualitative reports of improvements in sense of coherence, life satisfaction, well-being and/or quality of life	Field et al. (2013); Maitland et al. (2010); Parker & Boutelle (2009); Parker et al. (2011); Prevatt & Yelland (2015); Wentz et al. (2012)
Improved family functioning (2 studies)	Reduced family impairment or improved quality of family life/normalization	Evans et al. (2014); Garcia Ron et al. (2016)
Satisfaction with coaching (9 studies)	Quantitative or qualitative reports of participant acceptability and/or high satisfaction with coaching, view of coaching as a helpful intervention	Garcia Ron et al. (2016); Merriman & Coddling (2008); Parker & Boutelle (2009); Parker et al. (2013); Parker et al. (2011); Plumer & Stoner (2005); Reaser (2008); Vilardo et al. (2013); Wentz et al. (2012)
Maintenance of gains (3 studies)	Maintenance of coaching gains demonstrated over varied time frames	Kubik (2010); Merriman & Coddling (2008); Wentz et al. (2012)

Investigating the Outcomes and Perceptions of an Inclusive Aquatic Exercise Class for University Students with Physical Disabilities

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Abstract

The purpose of this study was to determine whether university students with physical disabilities (SWD) gained similar benefits from recreational physical activity participation as able-bodied (AB) university students as reported in the literature. Researchers designed an inclusive, university-offered aquatic exercise class for SWD. Six SWD volunteered for participation and six SWD volunteered for the control group. Quantitative survey measures were used to compare group changes in exercise self-efficacy, quality of life, and social inclusion following the five-week testing period. Qualitative interviews were used to explore the experiences of intervention participants. Independent t-tests revealed no significant differences in pre/post changes between groups, however thematic analysis of qualitative interviews indicated intervention participants perceived numerous positive outcomes and experiences resulted from the intervention, very similar to those found in AB university students. Results from this study provide important information on participant experiences, outcomes, and assist in future recommendations for recreational physical activity for SWD.

Keywords: Disability, inclusion, college students, adapted recreation, health

In 2011, over 1.1 million university students in the U.S. had a physical disability, effecting nearly 6% of the undergraduate population (Brault, 2012). It is well studied that physical inactivity levels in the adult population of persons with physical disabilities (PWD) are critically high. Despite the known benefits of physical activity (PA) participation, less than 30% of PWD meet the aerobic PA recommendations for health and a mere 15% meet resistance training recommendations (Erickson, Lee, & von Schrader, 2010; U.S. Department of Health and Human Services [USDHHS], 2011). Unfortunately, current research has demonstrated that the PA levels of university students with physical disabilities (SWD) may be reflective of the adult population of PWD (Dysterheft et al., 2016; Yoh, Mohr, & Gordon, 2008). While 70-88% of full- and part-time university students utilize recreational PA services (Lindsey & Sessoms, 2006; Stier, Schneider, Kampf, Haines, & Wilding, 2005; Tinto, 2006; Watson, Ayers, Zizzi, & Naoi, 2006), less than 30% of SWD regularly used their campus recreation facilities (Yoh et al., 2008).

This is particularly alarming as PA is considered one of the most pivotal factors in successful rehabilitation and health management for PWD. PWD who are physically inactive are at an elevated risk of physical deconditioning, which often leads to severe chronic health implications, such as cardiovascular disease and diabetes, overuse injuries, and pain (Ballinger, Rintala, & Hart, 2000; Curtis et al., 1999; Dearwater et al., 1986; Noreau, Shephard, Simard, Pare, & Pomerleau, 1993; Siddall, McClelland, Rutkowski, & Cousins, 2003; van der Ploeg et al., 2007; Washburn, Zhu, McAuley, Frogley, & Figoni, 2002), as well as secondary physical symptoms, such as increased spasticity, pressure sores, and high blood pressure (Heath & Fentem, 1996; Liou, Xavier Pi-Sunyer, & Laferrere, 2005; Noreau et al., 1993; van den Berg-Emons et al., 2011). Most alarming, however, are the secondary psychosocial symptoms of physical inactivity, which include increased risk of anxiety, depression, decreased quality of life, poor activity tolerance, and decreased independence (Dijkers, 1997; Le & Price, 1982; Manns & Chad, 1999; Santiago & Coyle,

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2004; Tomasone, Wesch, Martin Ginis, & Noreau, 2013). Inactive PWD are also more likely to experience feelings of social isolation, lack of acceptance by peers, and negative self-perceptions (Devine & Koch, 2003; Devine & Lashua, 2002; Devine & O'Brien, 2007; Devine & Parr, 2008; McLaughlin, Bell, & Stringer, 2004).

PA participation is known to not only counter these negative consequences, but also provide profound benefits. Specifically, these benefits have been observed in university students participating in recreational physical activities, such as recreational programming and activity courses. Research on recreational physical activity participation in able-bodied (AB) university students has observed improvements in students' university adherence, academic performance, peer inclusion, comfort with diverse populations, and healthy lifestyle habits (Astin, 1999; Devine, 2013; Devine & Lashua, 2002; Elkins, Forrester, & Noël-Elkins, 2011; Henchy, 2011; Kampf & Teske, 2013). Recreational activities have also been found to result in life-long benefits, aiding students in stress reduction, empowerment, and socialization into adulthood and the workforce (Devine, 2013; Miller, 2011). Unfortunately, little research exists on whether SWD gain the same outcomes from recreational physical activity as their AB peers. Previous research has reported that PWD gain social and confidence benefits with recreational physical activity participation (Ashton-Shaeffer, Gibson, Autry, & Hanson, 2001; Blinde & Taub, 1999; Choi, Johnson, & Kriewitz, 2013; Devine & Koch, 2003; Devine & Lashua, 2002; Devine & O'Brien, 2007; Kang, Zhu, Ragan, & Frogley, 2007). Additionally, PA levels during college and perceived disability levels were two strong predictors of PA levels into adulthood (Hedrick & Broadbent, 1996). However, the lack of information on SWD is particularly worrisome, as SWD may suffer higher social, personal, and academic consequences if the benefits of recreational physical activity are not obtained due to the physical and social consequences associated with disability (Devine & Lashua, 2002).

Although numerous studies have examined the benefits and barriers of recreational physical activity in SWD, few have addressed programming implementation of the specific and unique environment of university campuses. It is postulated that because SWD often have specific needs to perform physical activities, a lack of accessible and appealing activities may contribute to low participation levels and misconceptions of abilities (Devine, 2013; Martin, 2013). As many universities provide disability resource centers and adapted recreation opportunities,

it is pertinent for disability services providers to understand the programming wants, experiences, and outcomes of SWD participation in recreational physical activity. More so, the lack of SWD presence in university recreation facilities indicates a need to re-evaluate SWD wants and experiences in recreational physical activity in order to effectively enhance and design recreational programs (Yoh et al., 2008).

Therefore, the primary purpose of this study was to design and implement an recreational physical activity course for SWD, based on SWD input, to examine their experiences and outcomes of recreational physical activity. Using a mixed-methods analysis, we aimed to examine the experiences and outcomes of SWD participating in a recreational aquatic exercise (AE) class to gain a better understanding of adapted programming and design. It was hypothesized that participants in the AE class would have significantly greater improvements in exercise self-efficacy, perceived social inclusion, and quality of life (QOL) in comparison to an inactive control group. It was also hypothesized that survey results would be supported by qualitative data collected during the interviews. Information gained from this study may indicate SWD have similar benefits of recreational physical activity participation, as well as assist universities with adapted recreation program design to improve the university experiences and lifestyle habits of SWD (Bartholomew et al., 1998).

Procedures

Participants

The study protocol was approved by the university institutional review board. Study participation required that students be 18+ years of age, currently enrolled at the participating university, and identify as a PWD. Intervention participants were recruited from a new, adapted AE course offered by the participating university. After students registered for the course, the instructor provided them information about voluntary participation in the current study that would not influence their grade or activity in the course. For control comparison, undergraduate SWD who were not participating in any activity courses, competitive athletics, or regular recreational PA volunteered for the study control group. These participants were recruited from a sample of SWD from multiple universities who were participating in a parallel study. A total of six SWD qualified for the intervention group and six participants qualified for the control group. For participant demographics, see Table 1.

Intervention Design

Focus groups were conducted to gain more information from SWD for the design of recreational physical activity intervention (Staeger-Wilson & Sampson, 2012). Based on the findings from the focus groups, a socially-inclusive, adapted AE class was designed to address these findings as a recreational physical activity intervention for the current study. To promote social inclusion and address assistive needs, kinesiology undergraduates were invited to volunteer as exercise personal assistants and were required to assist participants with all AEs, as well as complete transfers, and clothing changes. Each participant was paired with two to three s, based on their personal and physical needs. Of the 20 undergraduate kinesiology students who volunteered for exercise personal assistant positions, 17 were able to participate during the class time.

Prior to working with participants, exercise personal assistants received two weeks of intensive education and training on AE, care, transfers, etc. Exercise personal assistants also received three experiential academic credits in the kinesiology department to participate in the AE course and facilitate each participant's exercise program. Under the supervision of the instructor, exercise personal assistants conducted all clothing changes, transfers, and AEs with their participant for each class period. With the permission of the instructor, exercise personal assistants were allowed to adjust or make additions to the exercise programs to fit their participant's personal wants or needs.

Prior to beginning the course, the instructor performed initial physical assessments on each participant to determine their capabilities and physical goals. Based on this assessment, the instructor created an individualized exercise program for participants. These programs were given to the exercise personal assistants to carry out with participants. Classes were held twice each week on campus, during the regular spring semester, and lasted 50 minutes.

Demographic and Quantitative Measures

Data were collected prior to starting the intervention or control period and after five weeks of participating in the intervention or the control period. Pre-intervention measures included a demographic information form and multiple, reliable and validated survey tools examining current recreational physical activity levels, perceived QOL, exercise self-efficacy, and social inclusion. These survey tools were repeated during the second session.

The Leisure Time Physical Activity Questionnaire for People with Spinal Cord Injury (LTPAQ-SCI) was used to measure recreational physical activity levels

of participants (Ginis, Phang, Latimer, & Arbour-Nicotopoulos, 2012). The six-item scale is a validated and reliable self-report measure developed for individuals with spinal cord injury and easily translates for individuals with other physical disabilities. LTPAQ-SCI scores were reported as cumulative values using the Godin LTPA equation.

To measure perceived QOL, participants completed the WHO Quality of Life-BREF (Chapin & Holbert, 2010; Skevington, Lotfy, & O'Connell, 2004). The WHO QOL-BREF has been found to be a valid and reliable with multiple populations of PWD. Mean scores for each domain are used to calculate the final domain scores, ranging between 4-100. Higher scores indicated a greater perceived QOL of participants for the domains. For this study, the domains will be reported as QOL Physical Health, QOL Psychological Health, QOL Social Relationships, and QOL Environmental Health.

Exercise specific self-efficacy was measured using the SCI Specific Exercise Self-Efficacy Scale (ESES; Barnes et al., 2012). The ESES is a valid and reliable, 10-item scale measuring a PWD's confidence in performing PA and exercise (Kroll, Kehn, Ho, & Groah, 2007). Each item is rated on a four-point Likert scale and results are summed to produce a final score ranging from 10-40. Higher scores indicate a greater perceived exercise self-efficacy.

To measure perceived social inclusion and opportunities the Social and Community Opportunities Profile – Shortened Version (SCOPE) was used (Huxley et al., 2012). Due to the extensive length and broad coverage of the SCOPE, only two domains, the Opportunities for Recreational Physical Activity and Opportunities for Inclusion, were used for this study. Domains of the SCOPE can be scored and summed. Higher values indicate more perceived opportunities and levels of inclusion.

Qualitative Measures

Post-intervention, the qualitative survey measures were repeated, and individual interviews were conducted. Interviews took place in quiet, private locations, based on participant preference. As interviews were aimed to understand participant experiences, control group participants were not interviewed. Interviews were conducted by the lead researcher, who was not involved in the administration or instruction of the course. Ten formal semi-structured, open-ended interview questions were developed prior to data collection using structured questions from previous literature (Blinde & McClung, 1997; Wolfensberger, Nirje, Olshanksy, Perske, & Nirje, 1972). These questions were modified to address participant experienc-

es in the AE course and outcomes resulting from the course. The lead researcher used intensive interview strategies and freely developed secondary questions to help direct conversation and encourage participant elaboration. At the end of the interview, participants were given the opportunity to provide any additional thoughts or comments about their experiences with the course. Interviews lasted an average of 28 minutes. All participant interviews were audio recorded using a digital voice recorder (Apple Voice Memo; iPhone 6, Apple Inc., Cupertino, CA, USA). Following the interviews, audio recordings were transcribed verbatim and then reviewed for accuracy by the interviewing researcher.

Data Analysis

Quantitative analysis. Analysis of demographic and survey data was performed using IBM SPSS Statistics Version 22 (SPSS, Inc., Chicago, IL). Prior to analysis of pre- and post-intervention survey scores, all data was analyzed for violations of normality, outliers, and errors. A Shapiro-Wilk test was used to test for normality of data distribution. Histograms and Q-Q plots were used to determine outliers. Demographic and survey data were analyzed for descriptive statistics. Based on normality of data distribution, Independent t-tests were used to compare changes in WHO QOL-BREF domains, ESES, and SCOPE domain pre- and post- intervention scores between groups. A Mann-Whitney U test was used to compare changes in the LTPAQ-SCI pre- and post-intervention scores between groups. Due to running multiple t-tests, a Bonferroni correction was used to set statistical significance at $p < 0.01$. Descriptive statistics are reported as mean (M) $\pm$ standard deviation (SD).

Qualitative analysis. To analyze the data from participant interviews, two researchers first read over three transcriptions and identified, analyzed, and interpreted primary themes found in the data (Braun & Clarke, 2006). The researchers used line-by-line, open coding strategies to develop primary themes found in the data until no additional novel themes were found (Corbin & Strauss, 2014). For further examination, researchers re-read the transcriptions and developed subthemes within each primary theme. Researchers then compared results of preliminary analysis to identify commonalities and discrepancies. Once the researchers came to a consensus of the recurring themes and patterns relating to the original research questions, a final codebook was developed. A third researcher was trained, and all transcriptions were coded by all three researchers, according to the final codebook. Each of the final coded transcriptions was checked for consistency. Additionally, an audi-

tor, who did not take part in the data collection process, was used to review all primary and subthemes, as well as coding. The auditor helped to examine transcription codes for bias and discrepancies, as well as address any data concerns (Braun & Clarke, 2006; Charmaz, 2014). Any discrepancies that occurred were discussed and a general consensus was reached.

To ensure credibility and transferability of the results during analysis standardized, pre-structured interview questions were used during all interviews to maintain reliability of data collection, questions were open-ended to allow participants to discuss their personal experiences, the interviewing researcher was not affiliated with the instruction of the course to allow for open discussion with participants, and interview data was triangulated with survey results and demographic data. Finally, the auditor aided in searching for negative cases, or outliers, to determine if any participants or data were not consistent with the emerging themes. While measures were carried out to ensure the credibility and transferability of the data, it is advised that readers use caution when generalizing the results of this study. These results may differ in other environmental contexts and with other populations as this intervention was performed at a university recognized for its disability services and efforts to be a disability-friendly campus.

Results

All descriptive statistics of the intervention and control groups are reported in Table 1. Due to the nature of the data, quantitative and qualitative results will be reported in an integrated structure. Results of the Shapiro-Wilk test indicated that all variables, except the LTPAQ-SCI ($p < 0.01$) had normal distributions. No outliers were removed from the dataset. Descriptive measures and results of the surveys are reported in Table 2. Results of the Mann-Whitney U test indicated significant differences between groups for LTPAQ-SCI pre- and post-intervention changes ($U = 2.00, z = -2.58, p = 0.01$). The control group did not show increases in recreational physical activity from pre- to post-intervention.

Quantitative and Corresponding Qualitative Results

Physical QOL. Results of the QOL Physical Health domain indicated that no significant differences occurred in pre- and post-intervention scores between groups (Table 2). Both the intervention and control groups had Physical Health domain scores similar to those found in previous studies on PWD (Barker et al., 2009; Yazicioglu, Yavuz, Goktepe,

& Tan, 2012). In contrast, data collected from participant interviews indicated participants perceived improvements in physical health, specifically facets included in the Physical Health domain of the WHO QOL-BREF, such as sleep quality, mobility, energy, and capacity (Skevington et al., 2004). All participants in the intervention group stated they perceived positive physical outcomes resulting from the AE class. Participants stated the AE class gave them more energy, helped them sleep better, and improved muscular strength, flexibility, muscular endurance, and mobility. For example, one participant with cerebral palsy stated that as a result of the AE, "I'm just really happy because...I've gotten to do stuff that I honestly never thought I could do." She expanded on this by explaining her improvements in walking up stairs and in a straighter line. Similarly, another student explained, "we're only half-way through the semester and I've gotten so much better with certain [exercises] so...it just makes me feel like...I can basically learn to do anything, given the right people".

Psychological QOL. Results of the QOL Psychological Health domain surveys also indicated no significant differences in pre- and post-changes between groups (Table 2). The intervention group had higher Psychological Health domain scores, whereas the control group had similar scores to those previously reported for PWD in the literature (Barker et al., 2009; Yazicioglu et al., 2012). The intervention group showed a small, but non-significant increase in mean QOL Psychological Health domain scores (Table 2). Data collected from the interviews supported this increase, as all participants reported positive outcomes in facets of the Psychological Health Domain, including self-esteem, learning, thinking, and positive feelings (*see Outcomes of Participation section*) (Skevington et al., 2004). Of the six participants, four stated they felt a sense of accomplishment and all six stated having positive feelings as an outcome of the AE class. Participants stated participating in the class gave them confidence to complete other exercises and activities. For example, when asked how the class affected her physical abilities, a participant responded,

I think it's changed a lot. Especially because I know how far I can push my body...now that I've actually pushed it to the limits...it's helped translate into giving [me] confidence in regular therapy too, because...it's like, if I can do this in the water, I can do this here.

Similarly, multiple participants explained they felt more willing to try new things, knowledgeable about their

own abilities and exercises to improve their health, and confident in overcoming tasks. One participant, who was also a competitive wheelchair racer, explained,

So of course I'm not like experienced in swimming, but it's nice to see that growth...I guess you can translate that to my life because I feel better about myself when I get out of class...that's nice for me to have something mentally that I'm excited for because wheelchair racing can be so competitive, it's nice to have that builder-upper.

Social QOL. No significant differences were found between groups for pre- and post-changes in QOL Social Relationships domain survey results (Table 2). Both groups had similar scores to those previously found in the literature of PWD (Barker et al., 2009; Yazicioglu et al., 2012). The intervention group did have a moderate, but not significant, increase from pre- to post-intervention (Table 2). Data from the interviews supported this increase with all participants reporting positive social outcomes, such as improved personal relationships and social support (facets of the Social Inclusion domain). Although some participants reported having a large peer network prior to participating in the intervention, all participants reported positive social relationships with their assigned exercise personal assistant. Most participants recognized the role of the exercise personal assistant was to assist, however as one participant explained,

For me it's like, yes, they are 'working for me' or helping me do whatever I need to do...but they're also, like we get to know each other and I can guarantee you the three of us will be friends after they graduate, guarantee you.

Another participant expanded on this by stating the exercise personal assistants being undergraduates, "makes them easier to talk to because, you know, while you're lying there stretching you can talk about 'hey did you see this happen on campus this weekend' or things like that". Most participants described the exercise personal assistants as relatable, which helped them to build a personal connection and made the class more relaxing. Additionally, three of the six participants stated the AE class helped them to build social connections with the other participants, as it served as a common factor between them. For example, one participant stated that although the participants often did not interact during the class,

It is nice walking around campus and seeing some of the other students in the class and you do ac-

knowledge them and that's nice to see, you know, someone who isn't in track, but also has a physical inconvenience that you can like walk by and say hello to.

Environmental QOL. No significant differences between group changes were found for QOL Environmental Health domain (Table 2). Following the intervention period, the control group had similar scores, but the intervention group had higher scores in comparison to those found for PWD in previous literature (Barker et al., 2009; Yazicioglu et al., 2012). A small, but non-significant increase in QOL Environmental Health domain scores was observed for the intervention group (Table 2). No themes were found in the interview data that corresponded to the facets of the QOL Environmental Health domain to support or refute these changes.

ESES. No significant differences were found scores between groups for changes in ESES scores from pre- to post-intervention (Table 2). Both groups had similar scores to those previously reported in the literature for PWD, with the intervention group having moderately, but not significantly higher ESES scores than the control group (Fliess-Douer, Vanlandewijck, & van der Woude, 2013; Kroll et al., 2012; Nooijen et al., 2013). The intervention group mean decreased slightly following the intervention (Table 2). In contrast, data from the interviews revealed nearly all participants ($n = 5$) reported feeling more confident and likely to attempt new exercises or activities as an outcome of participation in the AE class. Similar to the results reported for the Psychological Health domain, participants reported feeling less intimidated by new exercises or movements, more motivated to try new activities, and more confident in their ability to perform various movements or exercises. One participant explained that with her gains in strength,

I'm more willing to like try different stuff...because like, I was really nervous to do the stairs the first time because I thought I would fall backwards, which thankfully I didn't, but now I'm less scared to try to do new stuff.

Additionally, participants discussed feeling more confident as a result of the knowledge they gained from their participation. For example, one participant stated, "I know more about myself...I know more of my strengths and weaknesses". She expanded on this by explaining,

Well it's like, people can go to the gym and they know what amount of dumbbells to lift...(1) I

don't do that and (2) I wouldn't know, so I think [AE] is like my workout and how I determine [what to do].

Social inclusion. Results of the SCOPE revealed no significant differences in pre- and post-intervention changes between groups for the Perceived Opportunities for Recreational Physical Activity and Perception of Inclusion domains (Table 2). Post-intervention group results of the SCOPE are as follows: five control participants and six intervention participants agreed there were leisure, sports, or entertainment facilities on their campus. Only one of the control participants reported using these facilities, while five intervention participants reported use of them. On a rated scale from one-seven (one = Terrible, seven = Delighted) about how participants felt about their opportunities for leisure on their campus, the control group reported a mean score of 4.16 ± 0.75 and the intervention group reported a mean score of 5.00 ± 1.09 . In a short answer response option to describe what they would like to change about their leisure opportunities on campus, participants reported a need for increases in accessible sports, activities, equipment, assistance, and facilities. Participants also placed emphasis on a need for more leisure-based activities over competitive sports. When asked about the availability and range of opportunities to be involved with their campus, control participants reported mean scores of 5.50 ± 0.84 and 4.5 ± 0.84 , respectively. Intervention participants reported mean scores of 3.50 ± 1.52 and 5.33 ± 1.50 , respectively. Lastly, when asked to what extent they felt included within their campus community, control participants reported a mean score of 4.00 ± 1.60 and intervention participants reported a mean score of 5.50 ± 1.04 .

Qualitative Results

Analysis of the interview transcriptions resulted in three primary themes and eight subthemes based on 19 codes. Research questions, primary themes, subthemes, and corresponding codes are reported in Figure 1. Following the first research question, examination of the overall experiences of SWD participating in a recreational AE class resulted in two primary themes: Initial Perceptions and Future Recommendations and SWD Experiences. From the second research question, examination of SWDs' perceived outcomes from participating in a recreational AE class resulted in one primary theme: Outcomes of Participation.

Theme 1: Initial perceptions and future recommendations. During the interviews, participants were asked to describe and elaborate on their experiences during the AE class. On their own accord, many participants described initial perceptions or expectations prior to beginning the class, as well as recommendations for the design of future programs. These underlying themes created the two subthemes of Motivations & Anticipated Experiences and Recommendations.

Motivations and anticipated experiences. In the subtheme, Motivations and Anticipated Experiences, participants expressed their reasoning for registering for the AE class. Three of the six intervention participants had participated in AE or therapy previously and stated this as a reason for participation. The other three participants stated they had heard previously of the benefits of AE. All the participants explained that exercise for health and symptom management was a primary motivator for participation in the class. Examples of participant reasoning for participation included muscle maintenance, increased energy, increased flexibility, lung functioning, and continuing progress from rehabilitation. Two of the participants also stated athletic training and conditioning for a competitive sport was an additional reason.

The subtheme, Motivations and Anticipated Experiences, also included participants' explanations of their initial expectations for the class. As stated by participants, based on their previous experiences with adapted exercise classes, their expectations for rigor of exercises, knowledge of exercise personal assistants, and organization of the course was very low. When asked to elaborate on her expectations of the rigor of the class, one participant explained, "I get pushed really hard [during class]. Like honestly...not to offend you, but I didn't think it was going to be this detail oriented, I thought it was going to be kind of kicking and floating." Another participant described his anticipations for the exercise personal assistants by stating, "[The exercise personal assistants] are nice, they know what they're doing. They're not stupid, I was kind of worried they might be." When asked to explain why, he continued, "Well, because it's a brand-new class, so I figured [the instructor] might end up winging it a little bit, so I might get some people who don't know what they're doing." Many of the participants expressed having these initial concerns for the class. Additionally, five of the six participants explained that friendly, knowledgeable exercise personal assistants are significant to their enjoyment of the program. As one participant explained,

The biggest thing is making friends with the people that help me and honestly like, when people have to change you in and out of a bathing suit, it'd be kind of awkward if you couldn't have a conversation, so like that's really nice.

Most participants elaborated on this, stating that feeling comfortable with their exercise personal assistant was critical.

Recommendations. In the second subtheme, Recommendations, participants described aspects of equipment, class organization, safety measures, and exercise personal assistants that they felt were positive, as well as what could be done to improve future programming. Most participants ($n = 4$) reported a need for additional equipment to prevent waiting for use. This equipment included chair lifts, water wheelchairs, water weights, and water dumbbells. In contrast, most participants ($n = 5$) reported that having three exercise personal assistants seemed to be too many for the amount of assistance needed. Two of the participants recommended that participants meet the exercise personal assistants prior to beginning the class to review personal preferences. Five of the participants stated having undergraduates as exercise personal assistants was preferred to older graduate students or adults and should be maintained in future classes. Although one student stated that she and her undergraduate exercise personal assistant lose focus at times when in conversation, all participants stated undergraduates were more relatable. Participants also stated that having exercise personal assistants "their own age" made them easier to talk to and the classes more relaxed. Additionally, all participants stated that having undergraduate students interested in physical or occupational therapy was beneficial. One participant described the importance of exercise personal assistant interested in healthcare fields,

That's a big thing...finding the right people who want to be with people with physical inconveniences and want to learn more about that because, as much as they can offer to much, I feel like we can offer the same to them.

Four of the participants stated they would like to have more independence during the activities, however, due to safety regulations they understood it was not always possible.

Theme 2: SWD experiences. Many participants described their overall experiences while participating in the AE class. The descriptions of these experiences created the two subthemes of Experiences during the Class: Positive and Negative and Class Continuation.

Experiences during the class: Positive and negative. The first subtheme, Experiences during the Class: Positive and Negative, included participant reflections on their experiences with the exercise programs, their exercise personal assistants, and their experiences in the water. All participants reported positive experiences in the water. Participants with higher mobility limitations due to their disability stated that the water enabled them to move more freely, with less resistance. One participant described being in the water as, “I’m happy I can like move in ways that I normally can’t move.” Another participant explained,

I guess it is just different for us because we can do so much more in the water...I feel like I’m doing more of the exercises on my own, by myself, but like at therapy, normally someone is doing [the exercises] to me.

Similarly, other participants explained in the water they felt relaxed and free to move.

All the participants also reported having positive experiences with their exercise personal assistants, citing their undergraduate status, interest in therapy, and knowledge as primary reasons. At the same time, three participants also reported having negative experiences with certain exercise personal assistants, two reporting that themselves and their assistants got distracted at times from conversation and one participant reporting that she had an assistant who was not engaged in the class. All participants stated they had positive experiences with the exercises provided to them, with two of the participants recommending more individualized exercises.

Class continuation. The second subtheme, Class Continuation, consisted of participant statements of whether they would continue the class if it were provided the following semester. All the participants stated they would like to continue the class. Additionally, multiple participants requested it be offered multiple semesters for further continuation.

Theme 3: Outcomes of participation. The last theme included a statement describing the perceived outcomes they gained from participating in the AE class. The descriptions of these outcomes constructed the last four subthemes of Physical Benefits, Psychological Benefits, Social Benefits, and Academic Credit. Additional details related to these themes have been described earlier in the Quantitative and Corresponding Qualitative Results section.

The subtheme of Physical Benefits included participant statements of positive physical outcomes they received from participating in the class. All participants reported physical benefits.

The subtheme of Psychological Benefits included participant statements of positive psychological outcomes they received from participating in the class, including stress reduction, improved self-awareness and confidence, feelings of accomplishment, and knowledge. All participants reported psychological benefits as a result of participation in the class.

The subtheme of Social Benefits included participant statements of positive social or peer outcomes they received from participating in the class. Examples of these outcomes included participants stating they gained friendships, felt peer connections, or gained peer relationships outside of the class. Four of the participants reported gaining peer benefits, either inside or outside of the class.

The final subtheme of Academic Credit included participant statements of the importance of receiving academic course credit for participation in the class. As one participant explained,

This is going to sound strange, but the ability for us to receive the academic credit for this goes a long way because there’s a lot of my friends that take like ice skating and, you know, all of the random [kinesiology] one credit [activity] classes when they need them as seniors and this is kind of my equivalent for that.

The same participant expanded on this by stating,

How many [kinesiology activity] classes are there for one credit for the average student? And [SWD] have two, we have [physical therapy] and then this. If you can open that up and like, some people can’t swim, maybe they have like a feeding tube or something and they can’t swim, but if there were another sport they could do then they could have the same benefits of, “hey, look what I learned to do.”

All of the participants made recommendations for future classes, emphasizing the want for growth in an adapted recreation program and inclusive kinesiology activity classes.

Discussion

As the literature examining what influences SWD to participate in recreational physical activity grows, so does the need to understand their wants and experiences in recreational physical activity, to better develop appealing and effective adapted recreation programming. Using mixed-methods, we were able to examine participant’s personal outcomes, includ-

ing recreational physical activity levels, exercise self-efficacy, perceived social inclusion, and QOL and compare outcomes to an inactive, control group. This study provides information to help disability services and staff understand the beneficial experiences and outcomes of an exercise class for SWD. Most importantly, educators and staff in disability services may be able to use these valuable perceptions and experiences to improve adapted programming and SWD experiences at the university level.

Our first hypothesis was not completely supported, as no significant differences occurred between the intervention and control group for pre- and post-measures, except recreational physical activity (Table 2). While the intervention group reported significantly greater increases in recreational physical activity levels than the control group (Table 2), this was, in part, due to the addition of the AE class participation. However, participants reported feeling more confident in trying new exercises and activities. Future studies may incorporate more quantitative measures to compliment this design. Wearable sensors, such as accelerometers, show great promise in quantifying movements of wheelchair users in real-world environment (Learmonth, Kinnett-Hopkins, Rice, Dysterheft, & Motl, 2015).

While the intervention group did show large increases in recreational physical activity level following the intervention, no other personal outcomes from the WHO QOL-BREF domains, ESES, or SCOPE domains surveys significantly improved. However, information from the interviews contradicted these findings. This discrepancy may indicate a lack of sufficient power to detect post-intervention changes or the survey measures used were not sensitive enough to capture changes following the intervention. Future research should investigate interventions with larger sample populations, more sensitive survey measures, or the development of a mixed-methods survey to better analyze the outcomes and effectiveness of adapted recreation programming for SWD.

Despite the lack of significant changes in survey measures, information collected from participant interviews support that SWD may have similar, yet still very unique, experiences and benefits of recreational physical activity participation as their AB peers. Much like AB university students, participants reported having positive social outcomes from the class. However, unique to the participants, these social outcomes were primarily results of building relationships with their exercise personal assistants and less with other participants in the class. The comfort and development of relationships with their AB peers may assist in reducing feelings of social isolation, resulting from

social stigma of disability (Buffart, Westendorp, van den Berg-Emons, Stam, & Roebroek, 2009; Devine & Dattilo, 2000; Promis, Erevelles, & Matthews, 2001). Also, similar to AB university students, participants described improvements in stress reduction, confidence to complete exercises, and willingness to try new exercises and activities. Unlike their AB peers, much of the confidence to complete new exercises transferred into therapeutic exercise or activities of daily living settings. Although recreational physical activity opportunities are still limited at the university level for SWD, this confidence may also transfer into greater levels of independence, as well as activities outside of therapy and daily living. Disability services should consider integrating inclusive recreational physical activity for SWD early in their university years to help promote feelings of confidence and social inclusion on their college campus. These positive social and personal experiences may improve both SWD academic success and adherence to university programs (Astin, 1984; Tinto, 2007). While these results are in line with those of previous studies on PWD (Ashton-Shaeffer et al., 2001; Blinde & Taub, 1999; Choi et al., 2013; Devine & Lashua, 2002), further research should examine additional positive outcomes of recreational physical activity participation, such as possible academic benefits and long term benefits (Henchy, 2011; Kampf & Teske, 2013; Miller, 2011).

Specific outcomes very unique to SWD were also found. First, multiple participants emphasized they gained knowledge and self-awareness with exercise as a result of participation in the AE class. Although findings of improved health and interest in exercise have been found for AB university students (Henchy, 2011), these particular benefits may be much more critical for SWD. Interviews from previous research shows some SWD do not perceive themselves as able to exercise (Dysterheft et al., 2016) and find their disability to be a major barrier to exercise (Buffart et al., 2009; Rimmer, Riley, Wang, Rauworth, & Jurkowski, 2004). As observed in participants from this study, recreational physical activity participation may assist in improving a perceived ability to exercise, as well as inform SWD how to exercise and what they are capable of. Secondly, it was particularly interesting that participants emphasized earning academic credit as a positive outcome. This may indicate that SWD would be more likely to participate in recreational physical activity if they were able to obtain academic credit, increasing the likelihood of achieving the observed positive outcomes. Disability staff and educators should take this into consideration and advocate for academic recreational physical activity course credit

opportunities for SWD. The opportunity for academic credit not only may affect the participation rates and success of adapted recreation programs but could provide more equal opportunities for SWD.

Perhaps the most important information gained from this study was the participant expectations for the class and their recommendations for future programming. Alarming, most participants reported low expectations for the class design, rigor of exercise programming, and knowledge or dedication of the exercise personal assistants. Participants explained these expectations were based on previous experiences, which may give indication of a major barrier to recreational physical activity participation, previously unknown. Past studies have revealed that appeal of activities, degree of difficulty, and personal assistants/instructors are influential to both PWD and SWD PA levels (Dysterheft et al., 2016; Rimmer et al., 2004). Future research should focus on examining the extent to which negative previous experiences with adapted recreation programming acts as a barrier to PWD.

Additionally, participants made recommendations on equipment and exercise personal assistants. Participants recommended that enough equipment be available to prevent waiting or sharing of materials. This is in line with previous studies, in which lack of equipment was reported as a barrier to participation (Buffart et al., 2009; Martin, 2013; Rimmer et al., 2004). Based on the positive experiences with exercise personal assistants, many participants suggested that for future programming, assistants remain undergraduate students with career goals in physical and occupational therapy. Participants emphasized that they felt exercise personal assistants were more relatable, as well as dedicated to the class when these criteria were met. It was also suggested that exercise personal assistants and participants meet prior to the start of exercises to allow participants to explain personal preferences and abilities to their assistant. This likely may help SWD build trust with their exercise personal assistants prior to beginning an exercise program. It should be noted, during the focus groups and contact with the lead instructor, participants stated the necessity for exercise personal assistants to be provided by the class for participation. Although the participating university provided PA's for students, specific activities and locations are not included in that provision. Therefore, participants would have had to hire PA's specifically for the class. This was particularly interesting, as it may also indicate a previously unknown barrier to recreational physical activity participation.

Based on this information, disability services educators and staff should be mindful of multiple compo-

nents when designing adapted recreational programs for SWD. To ensure effective design and program implementation, disability services educators and staff should use programming strategies, such as Benefits Based Programming (Rossman & Schlatter, 2011). Originally developed to address social issues, Benefits Based Programming has been used to focus on the outcomes gained by those who participate in recreational opportunities. In order to specifically address SWD at their universities, disability services educators and staff should be aware of what activities their students want (Rossman & Schlatter, 2011; Specht, King, Brown, & Foris, 2002). SWD should be included on committees and panels to help with the design and renovation of programs (Staeger-Wilson & Sampson, 2012). By providing SWD with input and the ability to help choose available programming, the disability services providers can maximize benefits SWD gain from participation and ensure cost-effective program planning (Coleman, 1993).

Findings from this study should also be considered during the program planning process. It is pertinent for disability services providers to ensure that instructors involved in adaptive recreational physical activity can modify activities for multiple levels of ability. As stated by participants in this study, some adapted programming may not challenge SWD, thus undermining physical abilities or prevent participation (Devine, 2013). More so, instructors should be knowledgeable of adaptations to exercises, as well as social constructs of disability. Previous studies have observed that a perceived lack of knowledge of instructors/assistants, and negative perceptions or attitudes towards SWD can act as significant barriers to recreational physical activity participation (Devine & Dattilo, 2000; Devine & Parr, 2008; Rimmer et al., 2004). It is also recommended that all programs provide assistants to SWD to prevent the need for external provision. Overall, disability educators and staff should review their current programs to determine if they are meeting the expectations and goals of SWD, and then bring awareness to the successes or needs of the program (Rossman & Schlatter, 2011).

Limitations

Prior to drawing conclusions, some limitations of the study should be addressed. First, the data collected in this study is from a relatively small sample of SWD who self-selected to either participate in the AE class or not to participate in recreational physical activity at all. This resulted in a lack of randomization and should be addressed in future studies. Additionally, although participant demographics did not significantly differ, the intervention group

was selected from one university, whereas the control group participants were recruited from multiple universities. Next, the study took place at a highly accessible university, with a reputation for its dedication to inclusiveness of PWD. This dedication and the cooperation of the university kinesiology department and campus recreation allowed the intervention to be provided as a 100-level kinesiology course. Therefore, these results should be interpreted with caution and the acknowledgement that they may not apply to more diverse campuses and populations. Also, it should be noted that although the quantitative measures used failed to sufficiently denote changes from pre- to post-intervention, they may be effective in larger sample populations or following longer intervention periods. Finally, as with any qualitative study, analysis is subject to researcher bias. While multiple measures were used to minimize any bias during data collection, analysis, and interpretation, caution is recommended when generalizing results to other populations and environments.

Conclusion

Disability services providers have the opportunity to facilitate personal relationships with SWD and use SWD input to design successful, beneficial adaptive, inclusion recreational physical activity programming. Based on the results of this study, disability educators and staff may be able to better design adaptive recreation programming to provide positive social and personal outcomes to SWD.

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Table 1

Intervention and Control Group Demographics

Demographic	Intervention	Control
<i>n</i>	6	6
Age (years)	20.0 (1.26)	21.83 (2.48)
Gender	<i>M</i> = 1 (17%)	<i>M</i> = 4 (67%)
Years at University	1.42 (1.16)	2.75 (1.94)
Enrollment	Full = 6 (100%)	Full = 6 (100%)
Years since Injury/Diagnosis	20.0 (2.0)	12.67 (9.73)
Disability Types	CP (3), MD, SMA, PFFD	Arthro (2), FD, NN, RA, SMA

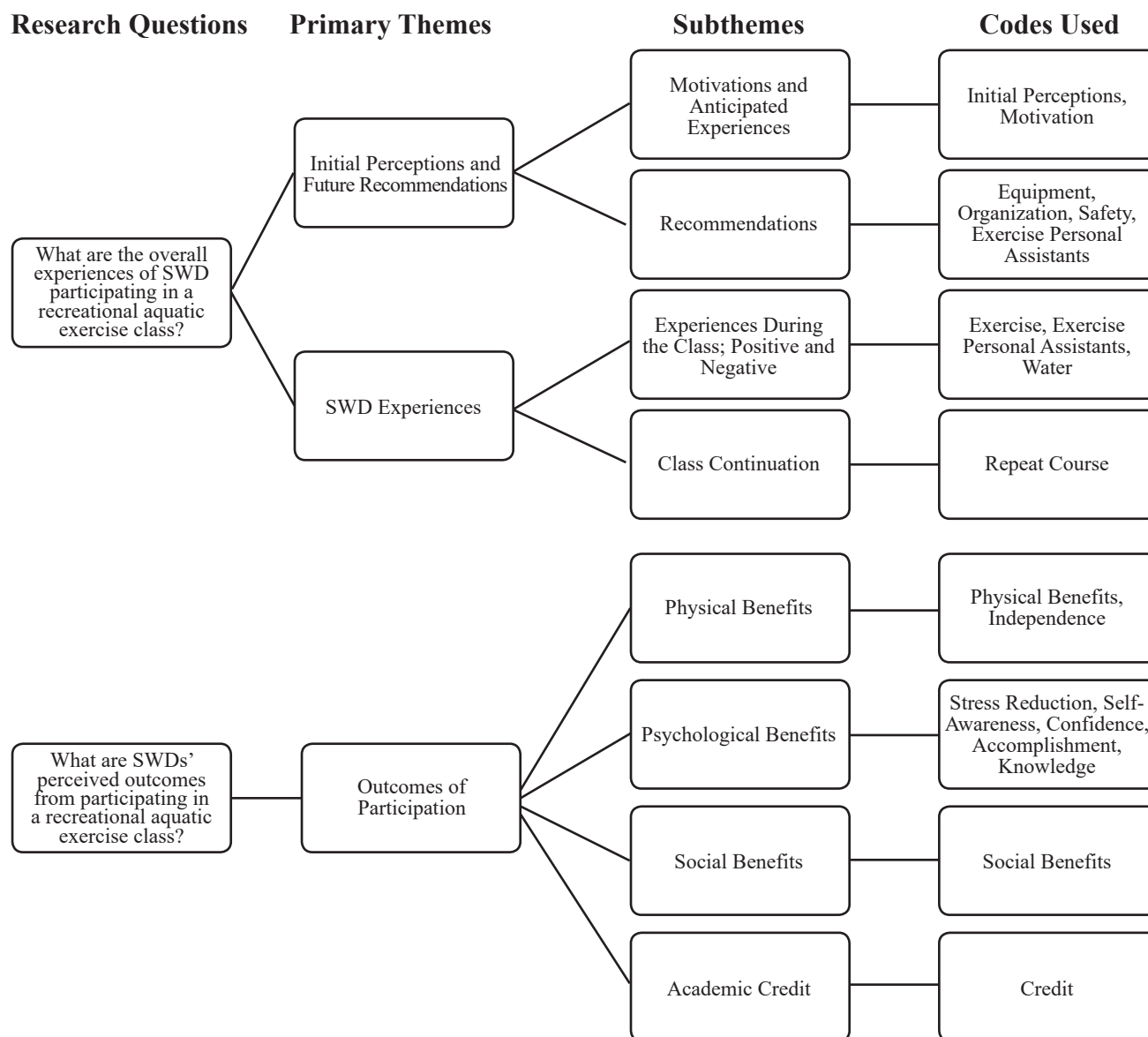
Note. M: Males; Full: Full-time enrollment; CP: Cerebral Palsy, MD: Muscular Dystrophy, SMA: Spinal Muscular Atrophy, PFFD: Proximal Femoral Focal Deficiency, Arthro: Arthrogryposis, FD: Fibrous Dysplasia, RA: Rheumatoid Arthritis, and NN: Nerve Neuralgia.

Table 2

Survey Outcome Measures

Survey	Group				
	Control		Intervention		Change Comparison
	Pre <i>M</i> (<i>SD</i>)	Post <i>M</i> (<i>SD</i>)	Pre <i>M</i> (<i>SD</i>)	Post <i>M</i> (<i>SD</i>)	<i>t</i> -score (<i>p</i>)
Godin RPA	13.66 (25.97)	10.17 (11.41)	16.17 (19.89)	40.83 (23.25)	2.00 (0.01)*
QOL Physical	62.50 (13.07)	62.83 (12.40)	71.00 (8.20)	69.00 (17.41)	-0.33 (0.75)
QOL Psychological	62.50 (13.07)	57.33 (18.74)	80.33 (12.40)	82.50 (7.45)	1.35 (0.21)
QOL Social	58.33 (31.71)	57.33 (31.33)	59.33 (17.24)	73.00 (19.74)	1.48 (0.17)
QOL Environmental	68.83 (14.87)	66.00 (23.63)	81.33 (10.52)	85.67 (8.69)	0.81 (0.44)
ESES	28.83 (3.25)	28.17 (3.54)	33.33 (3.56)	32.50 (4.85)	-0.96 (0.93)
SCOPE: Opportunities for RPA	8.67 (1.37)	8.67 (1.21)	9.33 (2.07)	9.50 (1.64)	0.14 (0.89)
SCOPE: Opportunities for Inclusion	18.00 (5.40)	19.33 (5.61)	17.17 (2.79)	17.67 (3.33)	-0.28 (0.79)

Note. Recreational Physical Activity (RPA): Leisure time PA, QOL: Quality of life, ESES: Exercise self-efficacy score; M: Mean, SD: Standard deviation. Independent t-test used to compare pre- to post-intervention outcome changes between groups. *denotes statistical significance.

Figure 1. *Qualitative interview results*

Perspectives of North American Postsecondary Students with Learning Disabilities: A Scoping Review

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Abstract

Despite the existence of policies aimed at ensuring equitable opportunities for individuals with disabilities, at the postsecondary level, students with learning disabilities and/or attention deficit/hyperactivity disorder have lower enrollment and completion rates than those without disabilities. To optimize policies and practices to support students with learning disabilities, it is crucial to incorporate the perspectives and experiences of such students. This paper presents the results of a scoping review of research based in the United States and Canada that addressed the perspectives and experiences of students with learning disabilities and/or attention deficit/hyperactivity disorder regarding postsecondary education. The five-step process for scoping reviews outlined by Arksey and O'Malley (2005) was used. A search of 10 databases resulted in 44 articles meeting the inclusion criteria, with most studies conducted in the United States ($n=35$) and using qualitative designs ($n=37$). Six themes were identified using an inductive analysis process: (1) supportive and non-supportive experiences with professors, faculty and counselors; (2) experiences of negotiating and receiving formal accommodations; (3) intrinsic factors affecting success; (4) influence of variability in timing and understanding of diagnosis; (5) stigmatization of disability status; and (6) social factors affecting success. Findings support the need for inclusive learning environments, better access to accommodations, collaboration between all stakeholders, and educational initiatives to combat negative attitudes and beliefs regarding students with learning disabilities among peers and faculty. Future research directions are also identified.

Keywords: learning disability, attention deficit/hyperactivity disorder, accommodations, stigma, social factors, self-knowledge

Education is a determinant of health, well-being, and community engagement (Canadian Council on Learning, 2010), and in North America, postsecondary education has become increasingly important. A United States (U.S.) Bureau of Labour Statistics (2014) survey indicated that individuals who attained postsecondary education had, on average, a lower unemployment rate and higher earnings than those who did not. As well, the U.S. Bureau of Labor Statistics' report (2015) on Employment Projections for 2014-2024 indicated that postsecondary education is required for entry into 11 of the 15 fastest growing occupations. Similar findings have been reported by Canadian organizations; for example, a Canadian Standing Senate Committee (2011) reported a doubling of jobs for postsecondary graduates to 4.4 million between 1990 and 2010, whereas the number of

jobs for individuals with a high school diploma or less declined by 1.2 million.

However, despite increasing numbers of individuals with disabilities entering postsecondary education and enhanced legislative frameworks to support the right to education (Katsiyannis, Zhang, Landmark & Reber, 2009; Ontario Ministry of Economic Development, Employment and Infrastructure, 2014), individuals with disabilities have lower enrollment and completion rates than those without disabilities (National Center for Special Education Research, 2009). In particular, students with learning disabilities and/or attention deficit/hyperactivity disorder (ADHD) have lower rates of postsecondary completion (Statistics Canada, 2013). As one example, the U.S.-based National Center for Learning Disabilities (2014) indicated that the rate of college completion for students

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with learning disabilities was 41%, compared to 52% of the general student population.

A significant number of persons in the United States and Canada have been identified as having a learning disability or ADHD, with respective estimates of 4.6 million and 622,300 adults (National Center for Learning Disabilities, 2014; Statistics Canada, 2013). In the U.S., learning disabilities represent the largest category of school-aged students receiving special education services. As well, students with learning disabilities are now enrolling in postsecondary education at approximately the same rate as their peers without learning disabilities (National Center for Learning Disabilities, 2014). Therefore, with increasing numbers of students with learning disabilities attending postsecondary education, it is imperative to provide appropriate services and accommodations to support learning and degree completion. Although they are separate disabilities, each with their own unique challenges that impact on learning needs (American Psychiatric Association, 2013); learning disabilities and ADHD were grouped together for the purpose of this review. This was done because these two disabilities are frequently grouped together in the literature, and because they are often comorbid (American Psychiatric Association, 2013; National Center for Learning Disabilities, 2014; Statistics Canada, 2013). Additionally, while individuals with learning disabilities and ADHD may experience different challenges, the functional consequences for academic performance often overlap (American Psychiatric Association, 2013).

Challenges in postsecondary contexts encountered by students with learning disabilities and ADHD extend beyond academic demands to encompass social, emotional, and behavioural aspects (Heiman & Kariv, 2004). For example, in the social realm, students with disabilities must create new friendships within an exceptionally diverse setting (Cunningham, 2001). As another example, in the emotional realm, students may question their own identity, including the nature and impact of their disability on their experiences and future prospects (May, 2001). Students with learning disabilities and ADHD may also experience additional challenges given the often “invisible” nature of their disabilities. According to Mullins and Preyde (2013), invisible disability can be defined as:

an umbrella term to refer to disabilities that interfere with day-to-day functioning but do not have a physical manifestation. Although some of the symptoms of the disabilities may be exhibited behaviourally, the cause of the disability cannot be seen. (p. 148)

As the number of students with learning disabilities and ADHD pursuing postsecondary education continues to increase, the diversity of professionals, such as professors, administrators, accessibility and academic advisors, and other support personnel, involved in supporting learning needs must ensure appropriate and effective programs and services for these students, particularly within legislative environments that support students’ rights to education, equity, and accommodations. In parallel, there is a recognition of the importance, aligned with adult learning principles and a human rights focus, of incorporating students in planning programs and services so that they optimally fit their needs and experiences (Mullins & Preyde, 2013). Furthermore, a review of literature published in the *Journal of Postsecondary Education and Disability* in the past thirty years found that the second most common, and most steadily increasing, type of study involved students with disabilities describing their experiences, perceptions, and attitudes (Madaus, Lalor, Gelbar & Kowitt, 2014). Thus, this scoping review summarizes the evidence generated thus far regarding the perspectives and experiences of students with learning disabilities and/or ADHD regarding postsecondary education, to inform future programs and services. It also points to future directions for expanding this body of research.

Research Objective

This scoping review aimed to provide an overview of existing research addressing the following question: how do students with learning disabilities and/or attention deficit/hyperactivity disorder perceive, experience, and negotiate postsecondary education in North America?

Study Design and Procedure

A scoping review was conducted to outline key concepts addressed in this area of research, summarize the evidence available, and identify directions for future research. Given the focus of the study on perspectives and experiences of students, a scoping review was an optimal approach as it allows inclusion of a variety of research designs (Levac, Colquhoun & O’Brien, 2010). The reviewers used Arksey and O’Malley’s (2005) steps, including: (1) identifying the research question; (2) identifying relevant studies; (3) study selection; (4) charting the data; and (5) collating, summarizing and reporting the results. These steps were carried out by the first two authors, who were occupational therapy students at the time of study completion, as well as two additional occu-

pational therapy students, with supervision from the third author, an occupational therapy faculty member.

Identifying Relevant Studies

Health sciences and education databases were searched, including: CINAHL, EMBASE, MEDLINE, PsycINFO, PubMed, Scopus, CBCA Education, ERIC, JSTOR, and ProQuest Education Journals. As recommended by Arksey and O'Malley (2005), an inductive approach was used in the study identification and selection phase, to enable search terms to be revised based on on-going results. Three categories of search terms were used, and included the synonyms of each term, along with a building block strategy in which the search terms were searched individually and then combined systematically using Boolean operators. The building block strategy used was (invisible disability OR disabilities OR non-visible disability OR learning disability OR dyslexia OR dyscalculia OR dysgraphia OR dyspraxia OR non-verbal learning disability OR attention deficit disorder OR attention deficit/hyperactivity disorder) AND (experience OR experiences OR perspective OR perspectives OR negotiate) AND (postsecondary education OR postsecondary institution OR tertiary education OR higher education OR university OR college OR postsecondary).

Searches were limited to peer-reviewed literature published in English from 1994 to 2014 conducted in the Canadian and/or U.S. context. Additional inclusion criteria were that an article addressed a research study (qualitative, quantitative, or mixed methods); focused solely on the perspectives and experiences of students with learning disabilities and/or ADHD, or included a section in which such perspectives and experiences were presented separately; and, focused on postsecondary education, or included a section in which results pertaining to postsecondary education were presented separately. The time frame of 1994 to 2014 was selected given that significant policy changes occurred in the United States and Canada related to disability and inclusion in the early 1990s. For example, both the 1990 Americans with Disabilities Act (Department of Justice, 1990) and Canada's five-year National Strategy for the Integration of Persons with Disabilities (1991-1996) aimed to promote inclusion of individuals with disabilities (Prince, 2004; United States Department of Justice Civil Rights Division, 2015). We focused on Canada and the U.S. only, given the diversity of policies across national contexts.

Study Selection

The list of 10 databases was split in half, with two reviewers searching each database. A title and abstract screen was first conducted on the resulting 31,935 arti-

cles in relation to the inclusion criteria. To increase inter-rater reliability, as suggested by Levac et al. (2010), two reviewers applied the inclusion criteria to each title and abstract independently to determine fit. When fit was difficult to determine, or the two reviewers disagreed on inclusion, the article was included for full-text screen. At this point, all duplicate articles were also removed, resulting in 242 articles.

The 242 articles were divided evenly between the four reviewers for a full-text screen in relation to the inclusion criteria. Each article was read and independently assessed for relevance by one reviewer. Where there was uncertainty about the relevance of an article ($n=55$), as is suggested by Levac et al. (2010), the other three reviewers were consulted, and the inclusion decision was reached by consensus. The research supervisor was consulted for the few discrepancies that could not be resolved. Overall, 44 articles were ultimately included in the review.

Charting the Data

A data extraction table was constructed to extract relevant information regarding methodology, methods, and findings, including: study purpose; research question; theoretical perspectives; disciplinary location; rationale for study; methodological approach; study design; location; type of postsecondary institution; number of participants; participant characteristics; type of disability; sampling methods; data collection methods; data analysis methods; main findings: supports; main findings: barriers; main findings: student's strategies; other important findings; author's conclusions; limitations; implications for future research/practice/policy; and, other implications presented. The process began with all reviewers and the research supervisor extracting data for three randomly selected articles, as a way of ensuring the table was comprehensive and being used in a reliable manner across reviewers. Through this iterative process, as was suggested by Levac et al. (2010), alterations were made to ensure the table captured all information and findings relevant to our question. Once the table was finalized, each reviewer was randomly assigned 10 or 11 articles and independently completed the data extraction tables for these.

Collating, Reporting, and Summarizing the Results

Using an inductive process, each reviewer examined their completed data extraction tables to determine categories across the findings and implications of the studies. Next, the reviewers came together to identify categories that crossed all studies. The reviewers collaboratively condensed findings into themes by looking for patterns in findings across categories.

Findings

Of the 44 articles included (see Table 1), the majority were conducted in the United States ($n=35$). Qualitative studies were most common ($n=37$), encompassing the use of qualitative interviews ($n=20$), focus groups ($n=8$), phenomenology ($n=6$), ethnography ($n=4$), case study design ($n=3$), reflexive case study ($n=2$), and grounded theory ($n=2$). Three articles reported on quantitative web-based surveys. The remaining four articles used a mixed methods design, consisting of surveys and qualitative interviews or focus groups. The findings are organized into six themes: (1) Supportive and Non-Supportive Experiences with Professors, Faculty and Counselors; (2) Experiences of Negotiating and Receiving Formal Accommodations; (3) Intrinsic Factors Affecting Success; (4) The Influence of Variability in Timing and Understanding of Diagnosis; (5) Stigmatization of Disability Status; and (6) Social Factors Affecting Success.

Supportive and Non-Supportive Experiences with Professors, Faculty, and Counselors

Supportive and non-supportive experiences with professors, faculty, and counselors were discussed in 25 articles. In several studies, students indicated that support from professors or personnel from university counselling services was the most important factor in their academic performance (Banks, 2014; Bolt, Decker, Lloyd & Morlock, 2011; Cornett-Devito & Worley, 2005; Denhart, 2008; Duquette, 2000; Erten, 2011; Greenbaum, Graham & Scales, 1995; Hadley, 2006; Hinckley & Alden, 2005; Koch, 2006; Litner, Mann-Feder & Guerard, 2005; Mytkowicz & Goss, 2012; Quinlan, Bates & Angell, 2012; Stage & Milne, 1996). One-on-one interaction with professors and opportunities to build relationships were seen as key, particularly when students experienced instances of helpfulness, concern, and accommodation for their disabilities (Cornett-Devito & Worley, 2005; Denhart, 2008; Duquette, 2000; Erten, 2011; Greenbaum et al., 1995; Hadley, 2006; Hadley & Satterfield, 2013; Hutcheon & Wolbring, 2012; McCleary-Jones, 2008; Koch, 2006; Mytkowicz & Goss, 2012; Nielson, 2001; Perry & Franklin, 2006; Quinlan et al., 2012).

Supportive instructors provided individualized instruction to meet student learning needs (Greenbaum et al., 1995; Mytkowicz & Goss, 2012; Quinlan et al., 2012), built rapport, and listened attentively to concerns (Cornett-Devito & Worley, 2005; Hadley & Satterfield, 2013; Koch, 2006), demonstrated knowledge about learning disabilities and accommodations (Bolt et al., 2011; Cornett-Devito & Worley, 2005),

and were available outside the classroom to support learning needs (Cornett-Devito & Worley, 2005; Hadley & Satterfield, 2013). Such professors took the time to work with students and focussed on their strengths to foster self-confidence and ability (Cornett-Devito & Worley, 2005; Hadley, 2006; Koch, 2006; Quinlan et al., 2012). The students also reported that an effective and informed instructor did not simply have a positive, non-judgmental view of disability, but also was aware of difficulties students face in developing strategies to address unique learning needs. Supportive educators were able to challenge and engage students in exploring ways to overcome barriers to learning (Cornett-Devito & Worley, 2005; Denhart, 2008; Erten, 2011; Koch, 2006; Mytkowicz & Goss, 2012; Quinlan et al., 2012; Velde, Chapin & Wittman, 2005).

Students described the nature of relationships with learning disability support personnel in a variety of ways, often combining the concepts of friend, mentor, and guide. Students felt appreciated and understood when disability support personnel ensured they were able to obtain appropriate accommodations, and helped them learn how to prioritize and study (Hadley, 2006; Koch, 2006; Perry & Franklin, 2006). Furthermore, guidance counselors and learning disability specialists were seen to play a crucial role in the self-development of students, providing social support and enhancing academic performance (Denhart, 2008; Hinckley & Alden, 2005; Koch, 2006; Mytkowicz & Goss, 2012).

In a smaller number of studies, students reported negative experiences with faculty members (Duquette, 2000; Hadley & Satterfield, 2013; McCleary-Jones, 2008; Nielsen, 2001; Troiano, 2003). A general lack of cooperation from instructors, faculty, and administrators was reported in three studies (Cawthon & Cole, 2010; Denhart, 2008; Greenbaum et al., 1995), and their negative attitudes were a barrier for students who required additional support for learning needs (Denhart, 2008; Erten, 2011; Hadley, 2006, 2007; Hadley & Satterfield, 2013; Lightner, Kipps-Vaughan, Schulte & Trice, 2012; Quinlan et al., 2012). Non-supportive instructors demonstrated a lack of knowledge and awareness about disabilities (Cawthon & Cole, 2010; Cornett-Devito & Worley, 2005; Erten, 2011; Greenbaum et al., 1995; Hadley, 2006; Nielsen, 2001) and were not flexible in providing accommodations (Cornett-Devito & Worley, 2005; Duquette, 2000; Ginsberg, 2008; Hadley & Satterfield, 2013). They refused to work individually with students to address learning needs, maintained rigid policy and teaching style, and questioned students' ability to succeed (Cornett-Devito & Worley,

2005; McCleary-Jones, 2008; Perry & Franklin, 2006; Stage & Milne, 1996).

Erten (2011) found that there was a gap in the understanding of learning disabilities, where students' academic success is taken as proof that their disability is not a problem of relevance to their academics. Students attributed their academic performance issues to this lack of understanding and course instructors' negative attitudes towards their disability (Denhart, 2008; McCleary-Jones, 2008; Nielsen, 2001; Perry & Franklin, 2006; Stage & Milne, 1996). Students reported anxiety when meeting with professors, attributing this to the assumption that professors were uninformed and unconcerned about students with disabilities (Hadley, 2006; Lightner et al., 2005). In the classroom setting, students reported non-supportive aspects of instructional methods such as professors moving through class material very quickly (Erten, 2011; Hadley, 2006, 2007), and not providing adequate time (Hadley & Satterfield, 2013; Lightner et al., 2012; Troiano, 2003). As an alternative, students sought help from peers or campus support services (Cawthon & Cole, 2010; Erten, 2011; Hadley, 2006; Koch, 2006; Lightner et al., 2012; Perry & Franklin, 2006).

Experiences of Negotiating and Receiving Formal Accommodations

Within 23 articles, formal accommodations were addressed as an important aspect of postsecondary education experiences. In the context of these findings, accommodations refer to needs-based requests required in the classroom for students to successfully meet course expectations, such as extra time to complete exams, note-takers, and assistive technology. Supports and services are used to refer to the overarching framework of accessibility centres in postsecondary settings. In 11 studies, participants expressed that accommodations or supports and services were necessary for postsecondary success (Bolt et al., 2001; Csoli & Gallagher, 2012; Denhart, 2008; Erten, 2011; Ginsberg, 2008; Greenbaum et al., 1995; Hadley, 2006, 2007; McCleary-Jones, 2008; Quinlan et al., 2012; Velde et al., 2005). See Table 2 for a list of specific accommodations reported by students.

However, in several studies ($n=10$), students expressed challenges in obtaining accommodations, supports, or services (Cawthon & Cole, 2010; Denhart, 2008; Greenbaum et al., 1995; Hadley, 2006, 2007; Hadley & Satterfield, 2013; Lightner et al., 2012; McCleary-Jones, 2008; Quinlan et al., 2012; Stage & Milne, 1996). Greenbaum and colleagues (1995) found that institutional barriers, such as rigid program requirements, made securing accommodations difficult, and in three studies participants report-

ed being unaware of services and accommodations available to them (Cawthon & Cole, 2010; Dwyer, 2000; Lightner et al., 2012).

Lightner and colleagues (2012) found that students reported many reasons for delaying acquisition of services, including a lack of time; the cost of psychological testing; the perceived hassle of accessing accommodations; and a lack of knowledge about one's disability, services available, or how to access services. Requirements to disclose disability (Quinlan et al., 2012) and fears of others' negative attitudes toward disability and being singled out or socially excluded for obtaining accommodations (Denhart, 2008; Erten, 2001; Quinlan et al., 2012) were cited as reasons students decided not to access accommodations. Three studies found that students experienced frustration across different contexts, including the process for receiving accommodations or extended time, and inadequate support from proctors (Hadley, 2006, 2007; Hadley & Satterfield, 2013).

Students in three studies expressed a necessity for a better network of supports and services to meet their needs (Dowrick, Anderson, Heyer & Acosta, 2005; Hadley, 2006, 2007), and one study highlighted the need for services to educate peers and faculty (Dowrick et al., 2005). Students felt professors' lack of knowledge did not excuse not making accommodations, rather that instructors should perceive the experience as an opportunity to learn (Quinlan et al., 2012). Despite the challenges of time and institutional barriers, students reported that offices for students with disabilities could be mediators that helped them manage their lives more effectively (Erten, 2011) and learn compensatory strategies (Getzel & Thoma, 2006). Students also reported that disability campus services and instructors assisted them with organization, and with understanding their strengths and weaknesses (Erten, 2011; Hinckley & Alden, 2005; Lightner et al., 2012).

Three studies explored the experience of postsecondary students with disabilities on clinical placements (Csoli & Gallagher, 2012; Kolanko, 2003; Velde et al., 2005). Kolanko (2003) found that some participants viewed using accommodations on placement as a last resort, as they did not want to disclose their disability to clinical supervisors. In a study by Csoli and Gallagher (2012), some students would only choose to disclose their disability after determining the perceptions of supervisors regarding learning disabilities and gauging their receptivity to disclosure. These studies identified a number of clinical challenges, such as a lack of time, difficulty attending to detail (Kolanko, 2003), and organizing placement responsibilities (Velde et al., 2005).

With respect to evaluating specific accommodations, supports and services, the reviewed studies discussed both coaching and the use of technology. Coaching programs for students with ADHD were investigated in five studies, which revealed positive outcomes in relation to time management skills (Parker & Boutelle, 2009; Parker, Hoffman, Sawilowsky & Rolands, 2011, 2013), organizational skills (Ginsberg, 2008; Hinckley & Alden, 2005; Parker & Boutelle, 2009; Parker et al., 2011, 2013), goal-setting and attainment skills (Parker & Boutelle, 2009; Parker et al., 2011, 2013), coping skills (Ginsberg, 2008; Parker et al., 2013), and self-regulation skills (Parker & Boutelle, 2009; Parker et al., 2011, 2013), as well as enhanced grades (Parker et al., 2011, 2013), self-efficacy (Parker & Boutelle, 2009; Parker et al., 2011, 2013), self-confidence (Parker & Boutelle, 2009; Parker et al., 2011), motivation (Parker & Boutelle, 2009; Parker et al., 2011, 2013), and self-awareness (Parker & Boutelle, 2009; Parker et al., 2011). Aspects of the coaching relationship found to contribute to positive outcomes included a caring (Parker et al., 2011; Parker, 2013) and collaborative (Parker & Boutelle, 2009) relationship where coaches engaged in ways that accommodated students' thinking styles and personalities (Parker et al., 2011). Students appreciated coaches who held them accountable for their learning (Parker et al., 2011, 2013), which enhanced their sense of autonomy and self-directed behaviour (Parker & Boutelle, 2009).

Four studies addressed the impact of technology on student learning, specifically related to supports and barriers, communication tools, and online courses (Hollins & Foley, 2013; Koch, 2006; Madaus, Bannerjee, McKeown & Gelbar, 2011; McCleary-Jones, 2008). For example, Madaus and colleagues (2011) discussed how course communication tools, such as email, chat rooms, and discussion boards, can facilitate learning for students with learning disabilities. Students reported positive aspects of online courses to include flexibility in scheduling and easy access to information in one location. Barriers to online courses included not having enough direction; delays in response, support, or feedback from professors; sole reliance on written communication; poorly organized websites; lack of knowledge on use of the course management system; and a lack of face-to-face interaction with professors. Additionally, it was found that online software did not allow extra time for assignments or tests, making it difficult to access accommodations (McCleary-Jones, 2008).

The transition from high school to postsecondary education in relation to accommodations was discussed in seven studies (Bolt et al., 2011; Cawthon

& Cole, 2010; Hadley, 2006, 2007; Hadley & Satterfield, 2013; Lightner et al., 2012; Stage & Milne, 1996). Students expressed increased expectations to seek out their accommodations in postsecondary settings (Lightner et al., 2012). Hadley (2007) found that students were critical of the amount of accommodations available in college compared to those available in high school, and reported feeling challenged to meet academic expectations with the limited services available to them. In two studies, students found writing services and peer tutors in postsecondary institutions to provide minimal assistance (Hadley, 2006; Stage & Milne, 1996). Finally, four studies noted the importance of effective transition planning (Cawthon & Cole, 2010; Hadley, 2006, 2007; Hadley & Satterfield, 2013).

Intrinsic Factors Affecting Success

Students perceived that particular attitudes ($n=9$) were crucial factors in postsecondary academic success, such as having a strong drive to succeed (Ekelman, Bazyk & Bazyk, 2013; Greenbaum et al., 1995; Perry & Franklin, 2006; Stage & Milne, 1996), a positive attitude toward themselves and learning (Duquette, 2000; Hinckley & Alden, 2005), and a belief in their ability to overcome adversity (Greenbaum et al., 1995; Hadley, 2006; Hinckley & Alden, 2005; Velde et al., 2005). These students also viewed themselves as being equal to the challenge offered by postsecondary studies (Duquette, 2000), and as being tenacious (Ginsberg, 2008; Greenbaum et al., 1995), and motivated to succeed (Greenbaum et al., 1995; Hinckley & Alden, 2005; Stage & Milne, 1996).

However, students connected having a disability, and the associated academic challenges, with poor self-confidence (Kolanko, 2003; Nielsen, 2001), poor self-esteem (Nielsen, 2001; Orr & Goodman, 2010), feeling self-conscious (Orr & Goodman, 2010; Stage & Milne, 1996), and self-blame (Duquette, 2000). Students also compared themselves to peers (Duquette, 2000; Erten, 2011; Hadley, 2006), which sometimes led to feelings of stupidity, inadequacy, and embarrassment (Kolanko, 2003; Orr & Goodman, 2010). However, many students with disabilities were able to develop self-efficacy (Cornett-Devito & Worley, 2005; Hadley & Satterfield, 2013; Hinckley & Alden, 2005), self-confidence (Ekelman et al., 2013; Hinckley & Alden, 2005; Kolanko, 2003), self-knowledge (Hinckley & Alden, 2005), self-reflection (Hinckley & Alden, 2005), self-understanding (Denhart, 2008; Litner et al., 2005; Stage & Milne, 1996), and self-acceptance (Kolanko, 2003). Acknowledgement and belief in their potential increased students' ability to persist and be successful academically (Hinckley & Alden, 2005).

The various skills that students found beneficial in negotiating postsecondary education ($n=10$) included conflict resolution (Anctil, Ishikawa & Scott, 2008), persistence and perseverance (Anctil et al., 2008; Duquette, 2000; Greenbaum et al., 1995; Litner et al., 2005), patience (Litner et al., 2005), self-determination (Cornett-Devito & Worley, 2005; Getzel & Thoma, 2006), self-advocacy (Anctil et al., 2008; Banks, 2014; Connor, 2009; Getzel & Thoma, 2006; Hadley, 2006; Troiano, 2003), problem-solving (Getzel & Thoma, 2006), goal setting (Duquette, 2000; Getzel & Thoma, 2006), self-management (Getzel & Thoma, 2006), negotiation (Troiano, 2003), assertiveness (Troiano, 2003), resourcefulness, and creativity (Duquette, 2000). Having knowledge about oneself and one's disability was also important (Anctil et al., 2008; Getzel & Thoma, 2006; Troiano, 2003), as well as knowledge about one's rights (Getzel & Thoma, 2006) and the legal and ethical responsibilities of postsecondary institutions (Troiano, 2003).

Fifteen studies addressed how students with disabilities became increasingly proficient in self-accommodation strategies while completing postsecondary education and connected these to their overall postsecondary success. These students were able to examine their own learning style and create learning strategies specific to their strengths and weaknesses (Dwyer, 2000; Hinckley & Alden, 2005; Hollins & Foley, 2013; Litner et al., 2005; Nielsen, 2001; Perry & Franklin, 2006; Stage & Milne, 1996; Troiano, 2003; Velde et al., 2005). A number of these strategies are common to many postsecondary students, including using a calendar or planner (Ginsberg, 2008; Hinckley & Alden, 2005; Perry & Franklin, 2006), making lists (Denhart, 2008; Ginsberg, 2008; Hollins & Foley, 2013; Perry & Franklin, 2006; Stage & Milne, 1996), studying in a quiet and distraction-free area (Ginsberg, 2008; Koch, 2006; Stage & Milne, 1996), using earplugs for concentration (Perry & Franklin, 2006), highlighting and underlining important text (Denhart, 2008; Hollins & Foley, 2013; Stage & Milne, 1996), constantly reviewing the material (Stage & Milne, 1996), sitting at the front of the class (Velde et al., 2005), asking for help from classmates and friends (Stage & Milne, 1996; Velde et al., 2005), and studying using practice tests (Greenbaum et al., 1995). Other strategies that students with disabilities reported using included setting short- and long-term goals (Hinckley & Alden, 2005; Stage & Milne, 1996), creating daily routines and organizing their time (Hadley & Satterfield, 2013; Stage & Milne, 1996), setting a timer while studying (Koch, 2006), using technology such as electronic books and tape recorders (Denhart, 2008; Litner et al., 2005; Stage

& Milne, 1996), allowing extra time to accomplish a task (Denhart, 2008; Koch, 2006; Stage & Milne, 1996), using positive self-talk (Hinckley & Alden, 2005; Hollins & Foley, 2013; Perry & Franklin, 2006), and taking fewer classes or studying part-time (Duquette, 2000; Perry & Franklin, 2006).

The Influence of Variability in Timing and Understanding of Diagnosis

Emerging in 13 studies, this thematic area addressed how the timing of the diagnosis of a learning disability or ADHD, as well as students' understandings of the diagnosis, were influential to postsecondary education experiences and success (Cawthon & Cole, 2010; Denhart, 2008; Dwyer, 2000; Erten, 2011; Getzel & Thoma, 2006; Ginsberg, 2008; Greenbaum et al., 1995; Lightner et al., 2012; Litner et al., 2005; Nielsen, 2001; Perry & Franklin, 2006; Troiano, 2003; Velde et al., 2005). A positive influence of receiving a diagnosis was reported in eight studies, which indicated that receipt of a diagnosis served to validate students' feelings regarding the symptoms and experiences of their disability (Denhart, 2008; Dwyer, 2000; Erten, 2011; Ginsberg, 2008; Nielsen, 2001; Perry & Franklin, 2006; Troiano, 2003; Velde et al., 2005). Two studies reported findings supporting early diagnosis (Nielsen, 2001; Troiano, 2003), which provided students with a greater amount of time to learn about, understand, and develop ways to manage their symptoms (Getzel & Thoma, 2006; Litner et al., 2005; Perry & Franklin, 2006; Troiano, 2003). While several studies noted the validating effect of receiving a diagnosis, some studies found negative impacts. For example, the diagnosis was viewed as a burden (Perry & Franklin, 2006), and students who were diagnosed later in life experienced greater challenges in understanding and accepting their disability (Troiano, 2003), as well as greater academic challenges (Nielsen, 2001).

Stigmatization of Disability Status

Twenty-five studies reported findings regarding stigmatization, defined in this review to encompass receiving differential, negative treatment based on the perceptions of others (Barga, 1996; Brown, 2009; Cawthon & Cole, 2010; Connor, 2012; Cornett-Devito & Wortley, 2005; Csoli & Gallagher, 2012; Denhart, 2008; Dowrick et al., 2005; Erten, 2011; Ginsberg, 2008; Greenbaum et al., 1995; Hadley, 2006; Hadley, 2007; Hutcheon & Wolbring, 2012; Koch, 2006; Kolanko, 2003; Lightner et al., 2012; Litner et al., 2005; Low, 1996; Orr & Goodman, 2010; Perry & Franklin, 2006; Quinlan et al., 2012; Stage & Milne, 1996; Troiano, 2003; Velde et al., 2005). Two recurrent

ideas were prominent in these studies. The first was the desire to have an identity beyond disability. Students discussed a fear that they would be “labeled,” and a desire for confidentiality was reported in ten studies (Hadley, 2006; Hutcheon, & Wolbring, 2012; Koch, 2006; Lightner et al., 2012; Litner et al., 2005; Orr & Goodman, 2010; Perry & Franklin, 2006; Quinlan et al., 2012; Velde et al., 2005). The second recurrent idea was the participants’ disclosure of their disability. Participants in these studies expressed fears of negative impacts of disclosing their disabilities or had a general reluctance to disclose. Although less common, some participants discussed how disclosure was helpful or required to receive supports or services (Cawthon & Cole, 2010; Csoli & Gallagher, 2012; Greenbaum et al., 1995; Hadley, 2007; Lightner et al., 2012; Litner et al., 2005; Low, 1996; Orr & Goodman, 2010; Perry & Franklin, 2006; Quinlan et al., 2012; Stage & Milne, 1996; Troiano, 2003).

Stigmatization regarding use and types of accommodations was also reported. Participants reported a reluctance to use accommodations due to the negative perceptions of their peers and others, as accommodations were viewed as a marker of weakness, as a privilege, or their disability was viewed as an excuse (Cornette-Devito & Wortley 2005; Denhart, 2008; Erten, 2011; Hadley, 2007; Lightner et al., 2012; Litner et al., 2005; Stage & Milne, 1996). Consequently, some students would rather receive a lower grade than request accommodations (Denhart, 2008). Finally, participants described feeling that their disability was a barrier or gatekeeper, that the label did not provide a solution, or that their disability caused them embarrassment (Barga, 1996; Brown, 2009; Cornette-Devito & Wortley 2005; Dowrick et al., 2005; Erten, 2011; Koch, 2006; Lightner et al., 2012; Stage & Milne, 1996; Troiano, 2003; Velde et al., 2005).

Social Factors Affecting Success

Social supports were reported as impacting students’ experiences in postsecondary education in 21 articles (Anctil et al., 2008; Banks, 2014; Cawthon & Cole, 2010; Connor, 2012; Duquette, 2000; Dwyer, 2000; Ekelman et al., 2013; Getzel & Thoma, 2006; Ginsberg, 2008; Greenbaum et al., 1995; Hinckley & Alden, 2005; Kolanko, 2003; Lightner et al., 2012; Litner et al., 2005; McCleary-Jones, 2008; Nielsen, 2001; Orr & Goodman, 2010; Perry & Franklin, 2006; Rabiner, Anastopoulos, Costello, Hoyle & Swartzwelder, 2008; Troiano, 2003; Velde et al., 2005). Most commonly reported ($n=13$) was the influence of family on a student’s success (Anctil et al., 2008; Duquette, 2000; Getzel & Thoma, 2006; Greenbaum et al., 1995; Hinckley & Alden, 2005; Lightner et

al., 2012; Litner et al., 2005; McCleary-Jones, 2008; Nielsen, 2001; Orr & Goodman, 2010; Perry & Franklin, 2006; Troiano, 2003; Velde et al., 2005). Of those studies, most regarded the family as having positive impacts. Friends and significant others were reported sources of support in eight studies (Duquette, 2000; Getzel & Thoma, 2006; Greenbaum et al., 1995; Hinckley & Alden, 2005; McCleary-Jones, 2008; Orr & Goodman, 2010; Troiano, 2003; Velde et al., 2005). In four studies, support was received from peers with learning disabilities or ADHD (Duquette, 2000; Getzel & Thoma, 2006; Ginsberg, 2008; Hinckley & Alden, 2005). Physicians were reported as a support in two studies and medication as a support in four studies (Cawthon & Cole, 2010; Duquette, 2000; Dwyer, 2000; Litner et al., 2005; Perry & Franklin, 2006; Rabiner et al., 2008).

Other supports included support groups, roommates, churches, internet forums, and pets (Duquette, 2000; Getzel & Thoma, 2006; Ginsberg, 2008; Greenbaum et al., 1995; Hinckley & Alden, 2005; McCleary-Jones, 2008; Troiano, 2003; Velde et al., 2005). Factors contributing to supports included an early diagnosis, participation in extracurricular activities, and an ability to make friends and interpret social interactions, whereas a lack of time to make or maintain friendships as a result of the demands of course work negatively impacted students. The reported impacts of having support included increased confidence, maintenance of personal worth, encouragement to attend postsecondary education and be successful, assistance with navigating systems, understanding disability needs, and seeking services. Alternatively, a lack of support for some participants resulted in development of increased independence and greater personal strength (Banks, 2014; Connor, 2012; Ekelman et al., 2013; Getzel & Thoma, 2006; Ginsberg, 2008; Greenbaum et al., 1995; Hinckley & Alden, 2005; Kolanko, 2003; Lightner et al., 2012; Litner et al., 2005; Orr & Goodman, 2010; Perry & Franklin, 2006; Troiano, 2003).

Discussion

Based on the assumption that it is crucial to draw upon students’ voices to inform practices and policy (Dwyer, 2000; Erten, 2011), this scoping review provides an amalgamation of what has thus far been learned from U.S. and Canadian students with learning disabilities and ADHD within research examining their lived experiences in postsecondary education. A comprehensive search of 10 databases found 44 studies published between 1994 and 2014 to answer our research question: “How do students with learning

disabilities and/or attention deficit/hyperactivity disorder perceive, experience, and negotiate postsecondary education in North America?” Six themes were generated: (1) Supportive and Non-Supportive Experiences with Professors, Faculty, and Counselors; (2) Experiences of Negotiating and Receiving Formal Accommodations; (3) Intrinsic Factors Affecting Success; (4) The Influence of Variability in Timing and Understanding of Diagnosis; (5) Stigmatization of Disability Status; and (6) Social Factors Affecting Success. Overall, the majority of the reviewed research focused on students’ experiences with faculty, accommodations, and intrinsic factors affecting success, while the remaining three themes were comparatively less prevalent.

Currently, students with disabilities are often required to navigate postsecondary environments that reinforce their “otherness” as they request accommodations and advocate for their rights (Green, 2007; Quinlan et al, 2012). The results of this review bring to light ways such a request-based system can be connected to delays and challenges in accessing accommodations, linked to issues such as faculty misunderstandings, complex processes for acquiring accommodations, and stigma. Thus, these findings further support consideration of changing from request-based systems of “special” accommodations towards the incorporation of universal design principles (Denhart, 2008; Hollins & Foley, 2013; Madaus et al., 2011).

Universal design is a method of creating products and environments that can be used by the greatest number of individuals without the need for adaptations or specialized designs (Ringaert, 2002). By considering a wider range of human abilities and functioning, a more accessible and inclusive environment can be created. In the realm of education, this encourages institutions to adopt instructional approaches that will benefit the greatest number of students possible. For example, the provision of lecture notes in alternate formats, such as audio recordings, can serve as a strategy for all students to review lecture content at their own pace and in a format consistent with individual learning needs. The wider availability of resources may also reduce the number of students who need to formally request accommodations for tasks such as note-taking. As summarized by the National Center on Universal Design for Learning in its UDL Guidelines – Version 2.0: Research Evidence (2011), extensive basic and applied research supports various universal design principles and strategies. As one specific example, in a pilot program aimed at training postsecondary faculty, it was found that faculty were largely unaware of the universal design for learning

principles and knew very little about the challenges faced by students with disabilities. After learning about, and implementing, universal design principles into the courses they taught, faculty found that there was an increase in student engagement and self-sufficiency, and overall positive effects on student learning outcomes (Langley-Turnbaugh, Blair & Whitney, 2013). This review reveals the attributes and behaviors of faculty whom students with learning disabilities and ADHD experienced as supportive, as well as those experienced as non-supportive. These findings can be drawn upon to inform educational programs and materials for faculty to assist them in optimizing learning environments for students with disabilities.

Critical disability scholars have argued that the notion that disability is something that needs to be “fixed” should be altered, and for a shift in focus from “disabilities” to “abilities” that places greater emphasis on student strengths and progress (Connor, 2012). Findings of this scoping review suggest that the stigma students with disabilities face can impact several aspects of postsecondary education experiences, including self-perceptions, experiences with faculty, staff and instructors, and their willingness to access accommodations. These findings point to the continued need to work with students with disabilities within educational and advocacy efforts aimed at dispelling myths and changing attitudes towards these students amongst their peers and faculty members. In relation to addressing students’ perceptions of themselves so as to diminish internalization of broader negative societal stereotypes regarding disability, several studies noted the importance of students perceiving that they understand their diagnosis and its implications for their learning. Such education has been identified as foundational for effective self-advocacy and should begin as early as possible in a student’s learning journey (Michaels & Orentlicher, 2004; Troiano, 2003).

In their roles as accessibility advisors, counselors, coaches, support personnel, and volunteers, disability service providers are uniquely positioned in the postsecondary environment to provide a variety of supports and services for students and faculty. For example, creating awareness of, and advocating for, disability rights on campus by educating faculty, staff, and the general student population about what it means to have an invisible disability and the predominant misconceptions related to these disabilities, can aid in decreasing stigma and enabling more inclusive learning environments. Disability service providers can also accomplish this by educating postsecondary faculty and staff on relevant accessibility legislation and standards, universal design principles and strategies, as well as providing recommendations for how

these standards, principles and strategies can be applied to lectures, course material, and online learning.

This review also supports the need for effective transition planning and provides support for a range of approaches used by disability service providers to support transitions (Bolt et al., 2011; Hadley, 2006; Hadley, 2007; Hadley & Satterfield, 2013). In addition to educating students on the services available to them, reviewing how to access accommodations, and linking students with various support personnel, disability service providers can facilitate workshops or coaching programs aimed at developing the skills necessary for postsecondary education success, such as self-advocacy and organizational and time management strategies. Finally, disability service providers can play an important role in helping students to gain a better understanding of their disability and its impact on their academic success, which in turn will assist students in identifying their strengths and accommodation needs.

Future Research

Methodological suggestions made within this body of literature point to ways to enhance generalizability of findings and ascertain causal connections, such as larger samples, more diverse student participants, and longitudinal designs (Bolt et al., 2011; Denhart, 2008; Dwyer, 2000; Erten, 2011; Madaus et al., 2011; McCleary-Jones, 2008; Orr & Goodman, 2010; Parker et al., 2011, 2013; Velde et al., 2005). Although it was noted that studies focusing on the experiences and perspectives of students with disabilities are important, the need for a greater emphasis on evaluative studies has been identified (Denhart, 2008; Erten, 2011; McCleary-Jones, 2008; Bouteille, 2009; Parker et al., 2013; Madaus et al., 2014). Future evaluative studies addressing what practices, programs and techniques are effective, and with what students in what situations, should include students in the measurement of outcomes as a means to direct the development of effective programs and services for postsecondary students with learning disabilities and/or ADHD (Madaus et al., 2014).

Several studies called for further examination of accommodation needs and the process of receiving accommodations for students with learning disabilities and ADHD, including the factors impacting access to accommodations and success at the postsecondary level (Bolt et al., 2011; Denhart, 2008; Greenbaum et al., 1995; Hutcheon & Wolbring, 2012; Stage & Milne, 1996). Building on existing research showing positive effects of universal design principles (Hall, Strangman & Meyer, 2003; Langley-Turnbaugh et al., 2013; Orr & Bachman Hammig, 2009),

further research into the implementation and effectiveness of universal design principles in the classroom would also be beneficial to determine how the implementation of such principles impacts the experiences and success of students with learning disabilities and ADHD. Expanding on the knowledge regarding students' conceptualizations of supportive faculty as well as key student skills and attitudes, further research is required to determine the nature and effectiveness of educational and skill development programs aimed at faculty and students (Cornett-Devito & Worley, 2005). Moreover, researchers have indicated the need for further study of the amount and nature of discrimination that students with disabilities face, the impact of self-efficacy across disabilities and ethnic groups, and the impact of these factors on success in postsecondary education (Denhart, 2008; Dowrick et al., 2005). Lastly, of the 44 studies that were reviewed, only nine were conducted in Canada. Additional research in a Canadian context would be beneficial to conduct national comparisons that could provide greater insights into how differing policies and practices impact the experiences of students with learning disabilities and ADHD in navigating postsecondary education.

Limitations

This scoping review has several limitations. First, the review is limited to research that focussed on students with learning disabilities and ADHD, therefore excluding many other "invisible" disabilities such as mental health conditions or visual and hearing impairments. Included research was also limited to studies published in English and in two countries. In addition, although methodological limitations and recommendations made by authors were tracked, consistent with the methodology of scoping reviews, a quality assessment of the reviewed literature was not conducted.

Conclusion

This scoping review summarizes existing research addressing supports and barriers in postsecondary institutions for individuals with learning disabilities and/or ADHD, as perceived by the students themselves. Drawing on this existing evidence, learning support personnel can develop and expand their role in addressing disparities in postsecondary education for students with learning disabilities and ADHD. For example, as change agents, such personnel can take an active role in advocating to address misunderstandings and stigma. Success in this area requires collaboration amongst key stakeholders, in ways that acknowledge the voices and strengths of students with invisible disabilities.

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Table 1

Descriptive Characteristics of Included Articles

Article	Methodology & Design	Context	Sample Size	Gender	Ethnicity	Diagnoses
Anctil et al. (2008)	Mixed methods, on-line survey & interviews	Northwest USA	Survey, $n=104$; Interview, $n=19$	Survey: Male (M), ($n=52$) Female (F) ($n=52$) Interview, M ($n=10$) F ($n=9$)	Survey: Majority, Caucasian ($n=90$) Interview: Majority, Caucasian ($n=17$)	Learning disabilities, including ADHD
Banks (2014)	Qualitative (QUAL), case study	Mid-Atlantic USA	$n=3$	M ($n=3$)	African American ($n=3$)	Language-based learning disabilities
Barga (1996)	QUAL, interviews & classroom observation	USA	$n=9$	M ($n=5$) F ($n=4$)	Caucasian ($n=9$)	Learning disabilities
Bolt et al. (2011)	Quantitative (QUAN), on-line survey	Mid-western USA	$n=55$	M ($n=17$) F ($n=38$)	Not reported	Learning disabilities
Brown (2009)	QUAL, ethnography	B.C., Canada	$n=4$	M ($n=1$) F ($n=3$)	Caucasian ($n=3$)	Learning disabilities
Cawthon et al. (2010)	QUAN, online survey	USA	$n=110$	Not reported	Not reported	Learning disability, including ADHD
Connor (2009)	QUAL, interviews	USA	$n=3$	M ($n=1$) F ($n=2$)	Caucasian ($n=2$); Aboriginal ($n=1$)	Comorbid learning disability & ADHD
Connor (2012)	QUAL, interviews	Northeastern USA	$n=3$	M ($n=1$) F ($n=2$)	Caucasian ($n=2$); Aboriginal ($n=1$)	Comorbid learning disability & ADHD
Cornett-Devito et al. (2005)	QUAL, phenomenology	Midwest USA	$n=21$	M ($n=9$) F ($n=12$)	Majority, Caucasian ($n=18$)	Learning disabilities, including ADHD
Csoli et al. (2012)	QUAL, interviews	Ontario, Canada	$n=2$	F ($n=2$)	Not reported	Learning disabilities
Denhart (2008)	QUAL, phenomenology	USA	$n=11$	M ($n=3$) F ($n=8$)	Caucasian ($n=11$)	Learning disabilities, Comorbid ADHD
Dowrick et al. (2005)	QUAL, focus groups	USA, Multiple	Not reported	Not reported	Varied	Learning disabilities
Duquette (2000)	Mixed methods, questionnaire, interviews, & focus group	Ontario, Canada	Questionnaire ($n=36$), Interview ($n=17$), Focus group ($n=6$)	M ($n=9$) F ($n=27$)	Not reported	Learning disabilities

Article	Methodology & Design	Context	Sample Size	Gender	Ethnicity	Diagnoses
Dwyer (2000)	QUAL, phenomenology	Canada	<i>n</i> =8	F (<i>n</i> =8)	Not reported	ADHD, Comorbid dyslexia diagnosis (<i>n</i> =1)
Ekelman et al. (2013)	QUAL, semi-structured interviews	USA	<i>n</i> =10	M (<i>n</i> =6) F (<i>n</i> =4)	Caucasian (<i>n</i> =5); Other (5)	Learning disabilities, ADHD
Erten (2011)	QUAL, focus groups	Canada	<i>n</i> =7	F (<i>n</i> =7)	Not reported	Learning disability (<i>n</i> =5), Comorbid ADHD (<i>n</i> =1) or mobility (<i>n</i> =1)
Getzel et al. (2006)	QUAL, focus groups & semi-structured interviews	Virginia, USA	<i>n</i> =34	M (<i>n</i> =16) F (<i>n</i> =18)	Caucasian (62%)	Learning disabilities & ADHD
Ginsberg (2008)	QUAL, case study	USA	<i>n</i> =1	M	Not reported	Comorbid ADHD & Dysgraphia
Greenbaum et al. (1995)	QUAL, interviews	Mid-Atlantic, USA	<i>n</i> =49	M (<i>n</i> =30) F (<i>n</i> =19)	Caucasian (<i>n</i> =48)	Learning disabilities
Hadley (2006)	QUAL, focus groups	Midwest USA	<i>n</i> =26	Not reported	Not reported	Learning disabilities
Hadley (2007)	QUAL, focus groups & semi-structured interviews	Midwest USA	<i>n</i> =10	M (<i>n</i> =2) F (<i>n</i> =8)	Not reported	Learning disabilities
Hadley et al. (2013)	QUAL, focus groups & semi-structured interviews	Midwest USA	<i>n</i> =10	M (<i>n</i> =2) F (<i>n</i> =8)	Not reported	Learning disabilities
Hinckley et al. (2005)	QUAL, interviews	New England, USA	<i>n</i> =13	F (<i>n</i> =13)	Not reported	ADHD
Hollins et al. (2013)	Mixed Methods, interviews & on-line goal-based tasks	North-eastern USA	<i>n</i> =16	M (<i>n</i> =4) F (<i>n</i> =12)	Not reported	Learning disabilities
Hutcheon et al. (2012)	QUAL, semi-structured interviews	Alberta, Canada	<i>n</i> =8	M (<i>n</i> =7) F (<i>n</i> =1)	Not reported	ADHD
Koch (2006)	QUAL, case study	USA	<i>n</i> =1	M	Not reported	Comorbid learning disabilities & ADHD
Kolanko (2003)	QUAL, collective case study	USA	<i>n</i> =7	M (<i>n</i> =1) F (<i>n</i> =6)	Not reported	Learning disabilities, Comorbid ADHD (<i>n</i> =2)
Lightner et al. (2012)	QUAL, phenomenology	USA	<i>n</i> =42	M (<i>n</i> =23) F (<i>n</i> =19)	Not reported	Learning disabilities, Comorbid ADHD (<i>n</i> =6)
Litner et al. (2005)	QUAL, ethnography	Quebec, Canada	<i>n</i> =16	Not reported	Not reported	Learning disabilities, including ADHD
Low (1996)	QUAL, ethnography	Ontario, Canada	<i>n</i> =9	M (<i>n</i> =3) F (<i>n</i> =6)	Majority, Caucasian (<i>n</i> =7)	Learning disabilities

Article	Methodology & Design	Context	Sample Size	Gender	Ethnicity	Diagnoses
Madaus et al. (2011)	QUAL, interviews	USA	<i>n</i> =10	Not reported	Not reported	Learning disabilities & ADHD
McCleary-Jones (2008)	Mixed methods, surveys & focus groups	South Central USA	<i>n</i> =10	M (<i>n</i> =3) F (<i>n</i> =7)	Majority, Caucasian (<i>n</i> =8)	Learning disabilities
Mytkowicz et al. (2012)	QUAL, semi-structured interviews	USA	<i>n</i> =14	M (<i>n</i> =8) F (<i>n</i> =6)	Not reported	Learning disabilities and/or ADHD, Comorbid (<i>n</i> =5)
Nielsen (2001)	QUAL, interviews	Alberta, Canada	<i>n</i> =8	M (<i>n</i> =4) F (<i>n</i> =4)	Not reported	Learning disabilities
Orr et al. (2010)	QUAL, multiple case study	Midwestern USA	<i>n</i> =14	M (<i>n</i> =8) F (<i>n</i> =6)	Majority, Caucasian (<i>n</i> =12)	Learning disability, Comorbid ADHD (<i>n</i> =6)
Parker et al. (2009)	QUAL, phenomenology	Vermont USA	<i>n</i> =7	M (<i>n</i> =4) F (<i>n</i> =3)	Not reported	Learning disabilities & ADHD
Parker et al. (2011)	QUAL, interviews	Midwestern USA	<i>n</i> =7	M (<i>n</i> =6) F (<i>n</i> =1)	Not reported	ADHD
Parker et al. (2013)	QUAL, interviews	Multiple campuses, USA	<i>n</i> =19	M (<i>n</i> =9) F (<i>n</i> =10)	Not reported	ADHD
Perry et al. (2006)	QUAL, grounded theory	Arkansas, USA	<i>n</i> =10	M (<i>n</i> =7) F (<i>n</i> =3)	Caucasian (<i>n</i> =10)	ADHD
Quinlan et al. (2012)	QUAL, interviews	USA	<i>n</i> =10	M (<i>n</i> =6) F (<i>n</i> =4)	Caucasian (<i>n</i> =10)	Learning disabilities, including ADHD
Rabiner et al. (2008)	QUAL, web-based survey	Southeast USA	<i>n</i> =1648 total, <i>n</i> =68 reported ADHD	M (<i>n</i> =24) F (<i>n</i> =44)	Majority, Caucasian (<i>n</i> =62)	ADHD
Stage et al. (1996)	QUAL, ethnography	Midwest, USA	<i>n</i> =8	M (<i>n</i> =4) F (<i>n</i> =4)	Not reported	Learning Disabilities
Troiano (2003)	QUAL, grounded theory	East Coast, USA	<i>n</i> =9	Not reported	Not reported	Learning Disabilities
Velde et al. (2005)	QUAL, phenomenology	USA	<i>n</i> =5	M (<i>n</i> =1) F (<i>n</i> =4)	Not reported	Learning disability, Comorbid ADHD (<i>n</i> =1)

Table 2

Formal Accommodations

Source	Specific Accommodations Reported
Cawthon & Cole (2010)	High school: assistive technology, alternate test format, tutor Postsecondary: classroom assistant, counseling, separate test location, extra time, other (priority registration, reduced load)
Denhart (2008)	Self-understanding, traditional accommodations, writing assistance, organization strategies, and visual strategies
Duquette (2000)	Extra time, note-taker, quiet room for exams
Dwyer (2000)	Classroom accommodations via formal process
Ginsberg (2008)	Computer, word processor for tests, note-taker for lectures
Hadley (2006)	Books on tape, note-takers, quiet room for exams, and extra time on exams, tutors, test proctoring
Hadley (2007)	Tests in a private and quiet location in testing centre, student proctors, extra time on exams, writing assistance, note-takers
Hadley & Satterfield (2013)	Test proctoring, books on tape, extra time for exams, note-takers for lecture through the office for students with disabilities
Hinckley & Alden (2005)	ADHD coaching services
Lightner et al. (2012)	Tutoring
McCleary-Jones (2008)	Quiet testing location, extra time
Parker & Boutelle (2009)	Coaching
Parker et al. (2011)	Coaching
Parker et al. (2013)	Coaching
Perry & Franklin (2006)	Extra time, written assignments and exams, note-taker, tutor
Quinlan et al. (2012)	Extra time and note-takers
Stage & Milne (1996)	Tutors
Velde et al. (2005)	Untimed testing, reduced distractions, special adviser, note-takers, cognitive strategy training, tips for reading articles, extra time

Applying Salutogenesis to the Experiences of Students with Disabilities in the Netherlands

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Abstract

Students with disabilities face several barriers during their academic lives. However, as many of them manage to access a variety of resources, their experiences can be examined through the lens of salutogenesis, which is employed to analyze the mechanisms whereby people succeed in preserving their wellbeing while dealing with stress and difficulties. This study seeks to explain how students with disabilities identify and use resources to reach their academic goals, and to understand how their sense of coherence (namely, a global orientation that expresses the extent to which a person feels that the world is comprehensible, manageable, and meaningful) developed over time. This exploratory study has a dual focus: to test the applicability of salutogenesis to students with disabilities and to investigate their life experiences. A life course perspective has been adopted to allow for an in-depth exploration of the life histories of 11 students with disabilities at Wageningen University. After the participants designed a timeline of their life, semi-structured interviews were conducted. The identified general resistance resources included social support and supportive environments, as well as flexibility, persistence, and awareness of their own skills and limits. Specific resistance resources ranged from aids and treatments to institutional services and disease information. Such resources were identified through reflexive processes that led the students to understand first the stressors that they were facing and then the resources that they needed to deal with these stressors. Finally, some recommendations for disability services providers are reported.

Keywords: Students, disability, salutogenesis, resources, life course perspective

Beginning academic studies brings about changes and new demands in the lives of students and is particularly challenging for students with disabilities, who show higher course failure and lower graduation rates than students of a similar age but without disabilities (Murray, Lombardi, Bender, & Gerdes, 2013; Sanford et al., 2011). In fact, these students have been found to face several physical and social barriers at the academic level that reduce their likelihood of success (Agarwal, 2011; Johnson, 2006). Nonetheless, the number of students with disabilities entering higher education has been gradually increasing over the last decades (Eckes & Ochoa, 2005; Paul, 2000) and, in spite of the difficulties they have to deal with, not all of them think of themselves as disabled (Tinklin & Hall, 1999). In this study, disability is defined as “the disadvantage or restriction of activity caused by a contemporary social organization which takes no or

little account of people with impairments and thus excludes them from participation in the mainstream of social activities” (Union of the Physically Impaired Against Segregation, 1976, p. 14). It is important not to confuse the concept of disability with that of handicap, as the latter may result from a disability and indicates a limitation on the fulfillment of a role that is considered normal (depending on age, sex, social, and cultural factors) for an individual (World Health Organization, 1980).

The positive experiences of students with disabilities can be understood through the lens of the salutogenic theory, which has been used to study the mechanisms whereby people succeed in maintaining their health and wellbeing while handling stressful situations (Antonovsky, 1979). This theory originated when Antonovsky, a medical sociologist, was studying the emotional health of a group of women who

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had been imprisoned in concentration camps during the Second World War (Antonovsky, 1987). In particular, Antonovsky found that some of these women successfully preserved their health; thus, he asked himself the “salutogenic question,” namely, how they succeeded in leading a good life (i.e., an active and productive life) in spite of such a negative experience (Eriksson & Lindström, 2008). Actually, health is a broad and complex concept, which has been defined as a state of complete physical, mental, and social wellbeing, and not merely the absence of disease (World Health Organization, 1948); therefore, being healthy does not necessarily mean not having an impairment.

In fact, although external observers often perceive people with disabilities as leading undesirable lives, some such people state that they lead a happy and satisfactory life (Albrecht & Devlieger, 1999). It is also true that not all disabilities are visible to the eyes of an observer. In fact, whereas physical, sensory, or mobility impairments may be apparent, hidden disabilities (e.g., attention deficit disorders, learning disabilities) are not as noticeable (Wolf, 2001).

Since some students with disabilities have been found to deal successfully with academic difficulties by being able to access appropriate equipment, social support, and positive responses from the university staff (Holloway, 2001; Murray et al., 2013), the salutogenic model may help shed light on their experiences.

Moreover, whereas some authors describe people with disabilities as ill (Naidoo, 2006), the salutogenic model (Figure 1) rejects the ill/healthy dichotomy and introduces a more dynamic ease/dis-ease continuum, where people constantly move between the ease (total health) and disease (total absence of health) poles. On this continuum, the occurrence of stressors is common. A stressor is a demand made by the internal or external environment and whose resolution requires a non-automatic, energy-expending action (Antonovsky, 1979). For example, the physical and social barriers faced by students with disabilities at the academic level can be thought of as stressors.

Then, Antonovsky identified resources that contribute to the resolution of the tension generated by a variety of stressors and called them generalized resistance resources (GRRs). Along with GRRs, Antonovsky also introduced the concept of specific resistance resources (SRRs), which are mobilized to deal with a specific stressor. The distinction between GRRs and SRRs has been further clarified by Mittelmark et al. (2016, p. 75), who specified that, whereas a GRR is a generality, an SRR is a particularity “whose meanings are defined in terms of the particular stressors they are invoked to manage.”

The ability to mobilize such resources effectively depends on the individual's sense of coherence (SOC), defined by Antonovsky (1987) as a global orientation that expresses the extent to which a person feels that the world is comprehensible, manageable, and meaningful. GRRs and SRRs originate from the social, cultural, and historical context in which people live, and they provide individuals with meaningful life experiences that further shape their SOC. In particular, it was found that, given a certain degree of disability, a person with a strong SOC is more likely to move towards the healthy pole of the ease/dis-ease continuum, thus suffering fewer handicaps than a person with a weak SOC (Schnyder, Büchi, Mörgeli, Sensky, & Klaghofer, 1999).

SOC was initially thought to develop mainly during childhood, reaching full development by the age of 30, after which it was expected to remain relatively stable (Bengel, Strittmatter, & Willmann, 1999). Nevertheless, Rena, Moshe, and Abraham (1996) argued that SOC's stability is an open issue, requiring further longitudinal research. Boström and Lassen (2006) pointed out that learning and meta-learning processes have the potential to shape the development of SOC. More recently, it was also found that both the stimulation of reflexive processes and empowerment can strengthen SOC (Super, Wagemakers, Picavet, Verkooijen, & Koelen, 2015). Nonetheless, a lack of qualitative studies in the salutogenic literature has been identified, along with a knowledge gap regarding how SOC is “shaped by historical and structural processes of which individuals are a part” (Harrop, Addis, Elliott, & Williams, 2006, p. 9). Given the complexity of these processes, it has been argued that their investigation requires qualitative research methods such as life histories.

Study Aim and Rationale

The salutogenic theory has not been used frequently in studies addressing individuals with disabilities (Lustig, Rosenthal, Strauser, & Haynes, 2000) and students (Heiman, 2004), and yet a call for the inclusion of their voices in research studies has been made in the past, to take their perspectives into account seriously (Healey, Bradley, Fuller, & Hall, 2006; Hurst, 1996; Preece, 1995). This study answers this call by involving students with disabilities at Wageningen University (the Netherlands) as, according to a national survey of students with disabilities in Dutch universities, they have a more positive experience than their Dutch peers (i.e., students with disabilities in the other Dutch universities) with their university's disability services, particularly in the following areas: intake, information, education adjustments, teachers'

knowledge and understanding, available resources, and guidance received (Steenkamp, 2013).

At the time of this study, disability in The Netherlands was regulated mainly by the Act on Equal Treatment of Disabled and Chronically Ill People (2003), which gives people with disabilities the right to access facilities and services that let them participate fully in society. In Dutch postsecondary education, students with disabilities were found to spend more time on their studies, make slower academic progress, and have lower exam grades and higher dropout rates than students without disabilities (see Table 1) (van den Broek, Muskens, & Winkels, 2013).

The focus of this study is twofold, consisting in the exploration of the applicability of the salutogenic model to the population of college students with disabilities and the identification and description of the life experiences of students with disabilities. Therefore, the aim of this study is to explain how these students identify and use the available GRRs and SRRs in order to reach their academic goals, and to understand how their SOC (namely, the ability to mobilize such resources) developed over time.

In order to achieve the study aim, the students' main stressors, GRRs, SRRs, and life experiences were investigated. This study, therefore, not only contributes to the aforementioned knowledge gap, but also allows for the development of recommendations for universities and society as a whole to foster the opportunities for success for students with disabilities.

Methodology

This research adopts a life course perspective, which locates individuals in their historical, social, and cultural contexts, and examines the life course as a multilevel phenomenon in which multiple pathways intertwine (Elder, 1998; Elder & Rockwell, 1979). In this study, retrospective data about the participants' lives were collected (Wadsworth et al., 2003). Prior to participation, each participant read and signed an informed consent form. An oral consent process was designed for a participant with visual impairments. This study was conducted with the approval of Wageningen University Social Sciences Ethics Committee.

Sampling Process

The target group for this study consists of students with disabilities attending Wageningen University. Criteria for inclusion in the study sample were attending Wageningen University as a student and having a disability. With respect to this latter criterion, a "student with disabilities" is here intended as any

student with an impairment, "who requires additional support, advice or guidance to enjoy equal access to educational provision" (Baron, Phillips, & Stalker, 1996, p. 364). Exclusion criteria were not being a university student (e.g., Ph.D. researcher, high school intern) and not being able or willing to speak English during the interviews.

The sample was recruited through three non-probability sampling strategies: purposive sampling, snowball sampling, and self-selection sampling. The latter strategy is reflected in the diffusion of leaflets, emails, and Facebook posts to publicize the study. Any student interested in participating in the study could contact the first author, and a meeting was planned. Finally, 20 students were reached, and 11 eventually joined the study (Table 2). The reasons for non-participation and dropout were having health problems and being too busy.

The final study sample includes only women, as no men contacted the researcher to join the study. Therefore, attempts were made to include men: two men were reached through purposive sampling, but they said that they were too busy and did not participate. Further attempts to reach men were curtailed by time constraints. Participants' ages ranged from 19 to 35 years, with the average age being 24.3 years. Nine participants were Dutch, one was Chinese, and one was German. The participants' real names are not reported in this paper; pseudonyms are used to protect their privacy. A summary of the participants' characteristics is provided in Table 3.

As shown in Table 3, the disabilities of three participants were reported as both visible and hidden. This arises because these participants would sometimes (but not always) use crutches or a wheelchair to cope with chronic tiredness, thus making their impairment visible to external observers. Another difference between the participants lay in the time that passed between the emergence of the symptoms and the diagnosis. For example, one participant waited for four years to receive a proper diagnosis, another waited for one year; others received a diagnosis as soon as the first symptoms appeared. However, for confidentiality purposes, this information is not included in Table 3.

Study Design and Data Collection

This research employs a case study design, as this allows for the detailed examination of a set of phenomena (Abercrombie, Hill, & Turner, 1984), and undertakes a life history approach, which is particularly suited to unveil the processes that take place in individuals' lives (Bakar & Abdullah, 2008). The first author collected data in October and November

2015. Two meetings were planned with each participant. A first, preliminary meeting was organized to start developing a relationship between the interviewer and the interviewee (DiCicco-Bloom & Crabtree, 2006) and to inform the potential participants about the study's aim and methods. At this meeting, the students were asked to design a timeline of their lives (i.e., a series of events written down in chronological order) prior to the second meeting. A timeline was requested not only to minimize the chances of recall bias, which is frequent in retrospective studies (Kruijshaar et al., 2005; Shiffman et al., 1997), but also because it is a useful tool for qualitative researchers to explore changes over time and contextual factors contributing to such changes (Deacon, 2000). Life experiences were explained to the participants as defining moments, or moments that they perceived as particularly important in their lives; then, examples of timelines were provided to the participants in order to facilitate their timeline design process. The participants were also asked whether they needed any kind of special accommodations; five of them requested to be interviewed in a specific place (i.e., at home or in their preferred campus building), and such requests were always fulfilled. At the second meeting, an in-depth interview was conducted. After an initial phase of familiarization with the participant, the timeline was discussed. The questions were not too rigid, and probes and follow-up questions were employed to unveil any potentially meaningful paths of inquiry. An interview guide was developed in order to improve the study's reliability and to provide guidance on the interview's phases and on the sequence of questions. Each interview was audio-recorded and transcribed to be available for data analysis.

Data Analysis

Data analysis was carried out according to Ritchie and Spencer's (2002) Framework Analysis, as this has often been employed in health-related research and is suitable for the development of recommendations (Srivastava & Thomson, 2009). Framework Analysis involves five steps, namely, (1) familiarization, (2) identifying a thematic framework, (3) indexing, (4) charting, and (5) mapping and interpretation.

In the first stage, an overview of the data was gained by reading the transcripts and listening to the recordings, thereby starting to list themes and key ideas. In the second step, the research notes from the previous stage were reduced according to *a priori* issues (i.e., originating from the research questions) and topics of interests (i.e., emerging from the interviews themselves). This process led to the development of five main categories, namely, academic goals, salu-

togenic mechanisms, stressors, resources, and life experiences. Each category was further divided into themes that were applied to the transcript during the indexing stage. At this stage, the software ATLAS.ti (Thomas Muhr, Berlin) was used to optimize the coding process, thus facilitating comparisons between quotes. In the fourth step, data were entered on a chart, to allow for thematic analysis. In the mapping and interpretation stage, relations between key dimensions were traced, on the basis of the researcher's interpretation and knowledge of the literature.

Given the interpretative nature of qualitative data analysis and the subjectivity of the researcher's interpretation, the results from the data analysis were cross-checked between the first and the second author. However, no inconsistencies between the two interpretations were found. In addition, all the participants received the study results via email to let them check for any inaccuracies and to protect their privacy.

Results

The participants in this study all had to face various stressful situations throughout their lives. Within the participants' family context, stressors were connected to parents' or siblings' health problems, absence of parents, and lack of child-parent connection. As the participants grew up and started primary and secondary school, new stressors emerged, such as pressure from teachers, exclusion by peers, and work overload. When the participants did not receive any help, additional stressors arose, such as not completing the school year successfully, devaluation of disability experiences, and loss of energy.

[High school] was hell! I was struggling with so much, and I got very little help from my school... I felt invalidated and hindered in my experience, also regarding my disability, I felt invalidated in the accommodations I needed and I didn't get. When things get worse, it gets so difficult to advocate for yourself when you're tired and everything hurts. (Anna)

Stressors within the academic context were studying full-time, not being able to attend lectures, and being prevented from studying and enjoying academic life because of pain and tiredness. Sometimes, students themselves brought on some of these stressors (e.g., studying full-time) as a result of a "pushing through" attitude, which ended up being detrimental to their health.

Some stressors varied depending on the nature of

the disability. Claudia, a student with dyslexia, had to re-sit many exams because it was difficult for her to display all her acquired knowledge in one three-hour exam. Students with attention disorders did not always avail of the extra services to which they were entitled, as they did not always remember to reserve such services in time. Some students with chronic tiredness had difficulty attending morning lectures or studying full-time. When students had muscular pain, handwriting was often perceived as distressing and uncomfortable. Finally, mental illness was associated with specific stressors at the academic level; Juliana reported that giving and receiving feedback was stressful and harsh. However, the students also succeeded in identifying both general and specific resistance resources in order to deal with such difficulties.

General Resistance Resources

Both external and internal GRRs were identified. External GRRs included social support, people's understanding, advice, and supportive environments. These resources often influenced one another, for instance when the students' networks did not merely give them care and understanding, but also helped them to make their disability more manageable.

I asked a friend of mine if he wanted to drive me to the lectures...and I asked my housemates to buy groceries for me. (Sarah)

In other cases, GRRs such as money helped the participants to access more specific resources, for example expensive diagnostic practices that would eventually shed light on their symptoms. The students' main internal GRRs were flexibility, persistence, and awareness of their own skills, limits, and resources. Sometimes, the students' persistence emerged as a consequence of other people's (e.g., doctors, parents, teachers) distrust in their capacities.

[My teacher] was like: "No, you should forget about that, you wouldn't be able to do that." I was crying! It was my life's dream, and it was just flushed in the toilet... And that was really hard... but I was like: "No, this is my life!" (Claudia)

Actually, several study participants did not think of themselves as disabled and complained about other people's paternalistic and belittling attitude.

He started giving me medical recommendations, and I was like "Yeah, I'm already doing that," what makes you think I haven't consulted a doctor? I don't know, people have a very weird thing with giving medical recommendations to people

they barely know, it's really awkward. (Anna)

I'm very smart...and then some stupid doctor tells me: "You're not going to study" ...so I was like: "I will, I will see how it goes" ...I wanted to try myself. That was my decision to make. (Claire)

When students were aware of their limits and resources and were also determined to reach their objectives and/or face their problems, they succeeded in adopting several strategies to overcome their difficulties, such as taking the initiative to understand and solve their problems, looking on the bright side of life, and prioritizing. The latter strategy did not just mean choosing among a list of activities, but also treating health as a priority. However, strategies were particularly effective when they were timely. In fact, when the students ignored their difficulties and waited too long before acting, this resulted in the further exacerbation of their problems.

I couldn't really go on with my normal life...this was really going on for years now, and I was always thinking "yeah, I will be fine after I graduate" ...then I saw I'm almost graduating and I'm not feeling fine, so I should do something, otherwise it will just go on, and on, and on. I don't want to have this for another...has it been fifteen years or something? (Juliana)

[When I suffered from energy loss] I kept going to school but, as a result of always pushing myself, I got those health problems again. (Iris)

Specific Resistance Resources

The identified SRRs were diverse and particular and fell into three main categories: aids and treatments, institutional services, and disease information.

All the participants made use of different aids or treatments depending on the nature of their health problem. For instance, students with chronic tiredness benefited from rest and sleep, but also from means of transport such as electric bikes and cars. Medicines were an SRR for several participants, but they did not always work as expected, and sometimes became a source of harm.

I've got some medication, but it only made me worse, so I stopped recently. But also the therapy, it didn't really work, so I got a new one...Right now it didn't really work, and sometimes it made me worse, but I hope they will find something. (Juliana)

With respect to institutional services, students with disabilities in the Netherlands have the right to extra services during both high school and university. At the academic level, study advisors and student deans were often mentioned by the participants as a precious source of advice and assistance. The resources most frequently listed by the students were exam adjustments (e.g., a 25% extension of the exam's duration, doing the exam on a computer and/or in a separate room, being able to stand up and walk during exams, and being able to go to the toilet anytime during exams); and thesis adjustments (a 50% extension of the time allowed to complete a thesis, support and cooperation from the thesis supervisor at the planning stage, and having a place to work on the thesis).

Finally, disease information refers to the participants' knowledge about their own health problems. In this respect, the diagnosis was often framed as a resource by the participants, as it shed light on their health condition and was usually followed by proper treatment. However, some participants had contrasting feelings regarding their diagnosis.

[When I got the diagnosis I was happy], I finally had some accepted proof that I was different, and that that was not my fault. (Sarah)

[My feeling on getting the diagnosis] was double, I think...because I knew it finally, but I also, it was also like...yeah, my whole life was gone, basically. (Claire)

Timing of the diagnosis also influenced the participants in different ways, and it usually had negative effects both when it was late and when it was early and unexpected.

I think I'm getting crazy, I think I'm getting crazy, everybody says that I'm healthy, and I'm not. (Sarah)

The doctor sent me to the hospital, and...it was bad, I had to have immediate surgery...you become immediately old...A lot of things happen to you, and, from a child, I became an adult in three or four months. (Flora)

According to some participants, the visibility of the disease was also a potential resource, as it could make their friends more willing to help them deal with a specific stressor.

I was walking with crutches, it's something that people can see, it's visible...and people see that and want to help, and at that time it was very nice to rely on people. (Sarah)

Still, visibility and other people's knowledge of the disease were not always regarded as a good thing. Both Sarah and Yoyo had chronic tiredness, but, whereas Sarah found the visibility of her disability helpful, Yoyo wanted to keep her privacy, without sharing any information about her health problems.

My friends, no one knows about this...If one person knows, all people will know, so I don't want to share, because they would think you are a patient, but now I'm not...I want them to treat me like a normal person. That's my issue. (Yoyo)

Therefore, even under similar circumstances, the same SRR could be helpful for one person but perceived as undesirable for another person. An overview of the main GRRs and SRRs identified in this study is included in Table 4.

Life Experiences

Life experiences were investigated as they have the potential to shape SOC (Antonovsky, 1979). Common life experiences included repeating a school year, negotiating accommodations with the school staff, and moving out of home. However, the students' perception of these experiences was varied. For example, two of the participants had to repeat a school year in the past, but timely knowledge of this information helped one of them to make sense of what was happening, and this ultimately influenced her perception of such events.

And then they let me wait for a whole summer, and at the end of the summer they said "no," so that was really bad...That made me lose faith in humanity and everything, and my life fell to pieces, really. (Claudia)

I knew, in December I already knew that I had to repeat the year...so I had a long time to get used to it, and actually it was kind of nice, because it made me enjoy the lessons I could go to. (Marie)

Furthermore, the students' childhood experiences were found to be particularly influential, as the participants who received constant support in serene family settings became more optimistic and resilient than those who grew up in isolation and in stressful family

environments. In the context of the participants' life experiences, learning processes were also identified and were triggered by reflection, experience, and observation of role models. Such processes enabled the participants to recognize useful resources or to understand how to tackle their difficulties.

At the beginning it was not easy to accept that I needed help, but now I do, because I got more life experiences. I just experienced what happens if you do not say things in time, and what happens when you do say things in time. (Esther)

My life, well, it hasn't been all flowers and pretty. As people say, "my life has been a mess" in the end, but I'm happy that I already had the basis to understand the difficulties and try to overcome them, and that gives me a lot of calmness. (Claudia)

Learning processes over the life course could also give rise to negative expectations about the future, in particular, when they were associated with scarce access and use of resistance resources, and with a series of adverse experiences.

Some things I think will always be difficult... Now some things are working, but I think I'll have difficulties later in life. I don't know if a potential employer would accept that, so I'm afraid... Sometimes I think, maybe one day I'll get a job, and then they could tell me "you take too much time," and then they could fire me. I'm afraid about that. (Claudia)

Discussion

As pointed out in previous studies, students with disabilities undergo a lot of stress and face obstacles and barriers in many areas of the educational environment (Agarwal, 2011; Johnson, 2006; Murray et al., 2013; Tinklin & Hall, 1999). This study confirms those observations, in that all the participating students had withstood several stressful situations in both their personal and their academic life. However, the students also showed an ability to mobilize resources to cope with those stressors. Among external GRRs, social support—which was often a source of other resources—had a preponderant role, as also indicated by other research studies (Holloway, 2001; Murray et al., 2013). In addition, this study identified the students' internal GRRs, with awareness (of their own skills and limits) and persistence playing an important role in the determination and effective-

ness of their coping strategies. Similarly, in a study conducted by Swan (2016), women's fortitude at difficult moments was found to help them overcome their difficulties and undertake more healthful eating practices. Furthermore, the importance of self-determination for students with disabilities in postsecondary education has been pointed out by past research studies (Field, Sarver, & Shaw, 2003), along with goal setting, self-management, and self-awareness, which were perceived by students with disabilities as important to stay in school and get the support they needed (Getzel & Thoma, 2008).

Still, divergences were observed among the participants with regard to their perception of stressors and resources. For example, whereas Claudia perceived a specific experience (e.g., repeating a year during high school) as a stressor, Marie perceived it as stimulating. The participants' perception of an experience as either stressful or motivating depended on several factors, such as the time of occurrence of the experience and the participants' ability to make sense of the situation (triggered by their SOC) and to identify and access appropriate resources. In fact, the perception of a stressor as such is very personal, and, although it can be expected that people with similar disabilities face similar barriers, it does not mean that they all perceive such barriers as stressors. In addition, in relation to a specific stressor, the same resource could be seen as helpful for one person but not (or even undesirable) for another. This finding can be interpreted in the light of Antonovsky's (1979) thinking, as he wrote that the usefulness of SRRs sometimes depends on chance or luck, thus being helpful only in particular situations. For instance, medicines were helpful for some participants but did not always have the desired effects for others, and sometimes even made the situation worse.

Insights from the Life Course Perspective

Wadsworth et al. (2003) stated that childhood experiences have the potential to influence an individual's future life. In this study, childhood contextual influences were indeed among the factors that determined the participants' ability (or inability) to cope with stressors later in their lives. Parents' and families' constant support put the participants on a safe developmental trajectory, as they felt confident that there was somebody to back them up if necessary. These students therefore gained more experience with identifying and using resources over the years and became able to identify and use resources as adults. On the other hand, participants with childhood experiences characterized by loneliness and poor communication with their parents and families, once adults, found it

hard to ask for help. Compared with the other participants, these students' positive life experiences, as well as the time they spent accessing and using GRRs and/or SRRs, were more limited. Claudia, for example, had to take care of herself since childhood and never got appropriate support from the high school she attended. Although at the time of this study she reported having access to a relatively large variety of resources and services at Wageningen University, she also believed that she would have difficulties in the future, and this pessimism came from her negative, former experiences, including the scarcity of resources that she could access when she was younger.

However, some participants' limited opportunities for finding and using resources over the years could still be compensated by later events. For instance, given a certain event, its timing could have different consequences for the participants' SOC. In fact, the life course perspective presupposes that the impact of life events depends on when they occur in a person's life (Elder, 1998). Time of receiving help constitutes an example of the difference between optimistic and pessimistic participants, as the students that received support as soon as it was needed eventually learned to find and use resources more easily than the students who started to get help only later in their life. As access to help and/or treatment also depended on the availability of a diagnosis, timing of the diagnosis was crucial as well. In fact, when the diagnosis came late, the participants felt anxious because of the uncertainty of their health conditions, and their symptoms remained untreated for a relatively long time. Similarly, when the diagnosis came unexpectedly, the participants were scared and were not prepared to deal with its implications. Thus, both conditions had a potentially negative impact on SOC. This reflects the fact that events that occur late or early can have adverse effects (Elder, 1998).

Sense of Coherence and Resource Identification

Figure 2 provides a visual description of the mechanisms whereby the participants in this study were able to identify resources, and the way in which this was found to affect their SOC. As premised by Antonovsky (1987), the foundation of individuals' SOC is laid during childhood. The combination of salutogenesis and the life course perspective in this study allowed for further confirmation of this statement. Still, later experiences also shaped SOC. Interestingly, the life course perspective did not allow for the identification of any intrinsically negative or positive events for the development of SOC, but rather disclosed that the same event could have either a positive or a negative impact on SOC, depending on its timing.

The participants' life histories consisted of a variety of experiences that included dealing with stressors. The salutogenic theory postulates that a person needs to mobilize GRRs and/or SRRs to deal with the tension caused by a stressor. The participants in this study first engaged in a reflexive process that enabled them to understand the characteristics of the stressor they were facing, such as its causes and implications. Then, learning processes fostered by experience, reflection, and observation of role models helped them to identify the most appropriate resource for dealing with such stressor. In particular, the participants' awareness of their own skills and limits, previously identified among their main GRRs, fostered such reflexive processes. This finding further clarified the relationship between GRRs and SRRs, whereby the former "enable one to recognize, pick up and use specific resistance resources in ways that keep tension from turning into debilitating stress" (Mittelmark et al., 2016, p. 74). In fact, GRRs may help people identify, access, and use SRRs; for example, the GRR "money" was used by one of the participants to access the SRR "specialized diagnostic services". If the participant had access to such a resource, she used it to deal with the tension generated by the stressor. The described mechanisms are coherent with Boström and Lassen's (2006) observations, which emphasized that learning experiences originating from specific situations may have a profound effect on SOC. Finally, according to the salutogenic model, using resistance resources to deal with a stressor provides the individual with meaningful life experiences, which in turn shape his/her SOC.

Disabled or Not?

Although this study focused on disability, it is worth noting that several of our study participants did not always define themselves as disabled. This was also observed by Tinklin and Hall (1999) in their research involving students with disabilities in higher education. After all, although an impairment is easily acknowledgeable, the same cannot be said for a disability. In fact, whereas the World Health Organization defined the term impairment as "any loss or abnormality of psychological, physiological, or anatomical structure or function" (World Health Organization, 1980, p. 47), the concept of disability is multifaceted and has been explained by a variety of models. According to the medical model, disability is caused by an impairment, and its origin lies "in the individual's supposed deficiency" (Abberley, 1998, p. 79). The social model, on the other hand, moves the source of the disability from the individual to society as a whole. In this case, individuals with dis-

abilities are confronted with a disablist society that disables them because of their impairments (Oliver, 1996). The participants in this study felt closer to the interpretation provided by the social model, as they rejected people's paternalistic attitudes, which often drew on the medical model. Furthermore, whereas an impairment can be documented, there are no "requirements" to belong to the "community" of people with disabilities (Watson, 2002). The reflection upon the distinction between disability and impairment can be taken even further. For example, according to Scully (2004), many people consider deafness a disability, whereas deaf people think of themselves as a linguistic minority, and "the presence of impaired hearing" is different than the "absence of subtitling on TV."

Likewise, the majority of the participants in this study, although facing barriers of many kinds, also managed to enroll and study at a university, sometimes with very good academic results. Therefore, it is questionable whether any labels would be appropriate to describe this study population; ultimately, people with disabilities may take different positions on the ease/dis-ease continuum (Rena et al., 1996), and their variations in health over the life course are no different than those of any other person (Rimmer, 1999). However, it must be acknowledged that the participants' perception of their disability status may depend on several factors; for example, this study's participants were all able to study at the academic level and to participate in interviews; it can be assumed that students with more serious health impairments may have decided not to participate in this study. Furthermore, the participants' ability to identify, access, and use GRRs and SRRs may also have influenced the perception of their disability, as SOC is known to influence the psychosocial effects of a given health problem (Schnyder et al., 1999).

Limitations and Strengths of the Study

Although several measures were taken to avoid any source of bias, this study presents some limitations that are worth addressing. Firstly, some characteristics of the sample (e.g., socioeconomic status and religious beliefs) could not always be collected, and generalizability of the findings is prevented by the sample size ($n=11$) and the absence of men in the sample. In fact, no men spontaneously contacted the researcher to express interest in participating. This may be due to the fact that women have a greater tendency than men to report functional problems and are more involved with health and healthcare (Merrill, Seeman, Kasl, & Berkman, 1997), whereas men are more likely to internalize public stigma (Vogel, Wade, & Hackler, 2007). Future studies may anticipate this

possibility, and several strategies may be planned to involve men, such as writing gender-tailored recruitment messages, designing recruitment advertisements so that the definition of disability is in no way perceived as stigmatizing, and empowering potential participants by making the meaningfulness of their contribution clear. However, generalizability of the findings was not of primary importance, as this study rather aimed to obtain richer and in-depth accounts, which would not have been achievable with a large sample. Furthermore, issues related to non-response must be considered. In particular, the reasons behind non-participation and/or dropout were health problems and being too busy (the latter often being a consequence of the former). This tendency seems to point to the phenomenon of selective attrition, which may thus be more likely to occur among this study population.

A limitation concerning the study methodology is recall bias. Recall bias usually occurred when the participants were describing their childhood years or when they were confused about the actual sequence of events. However, the timeline design addressed this limitation by letting the participants reflect on their lives prior to the interview. On the other hand, a strength of this study's methodology lies in the combination of salutogenesis and a life course perspective, which allowed the authors to investigate the contextual influences shaping SOC and unveil the effect of timing on its development.

Conclusions and Recommendations

The salutogenic framework was employed to understand how students with disabilities identify and use resources in order to deal with stressors. GRRs for students with disabilities included social support and supportive environments, as well as flexibility, persistence, and awareness of their own skills and limits. SRRs ranged from aids and treatments to institutional services and disease knowledge. Nevertheless, the same resource could be perceived as useful by one student and as undesirable by another student. The effectiveness of resource mobilization depended on the timely activation of learning processes that enabled the students to understand the nature of the stressor that they were facing and the resources they needed to cope with such stressor.

Further research can be recommended to acquire more knowledge about salutogenesis and the life course perspective. For example, as this study sample included only women, future research studies may also address men with disabilities, to unveil any possible differences in life experiences and access to resources between men and women. Moreover, fu-

ture research may focus on the life experiences of students without disabilities, to offer a comparative perspective with respect to their life histories and salutogenic pathways.

Based on this study's findings, some recommendations can be made for the implementation of academic—and, more generally, social—disability services. For example, building and strengthening networks can help students with disabilities to access new resources and to receive social support. Furthermore, as it was found that the same thing could be considered a resource by one person and a stressor by someone else, it is important to tailor advice to the complexity of students' life experiences, rather than to their specific health impairment. Some students were not even aware of their own limits and resources until someone brought them to their attention, and such situations might require proper education of the school staff (at all educational levels) about disability and its implications, as students mostly have contact with teachers and mentors/advisors. Disability service providers (DSPs) at university level may therefore investigate students' experiences, resources, and assets rather than focusing only on their problems and impairments. In this respect, DSPs may consider developing a list of questions to employ while counseling, to understand and explore students' experiences, paying particular attention to their childhood, adolescence, and former educational experiences. Some students may acquire a disability during their time in college. As observed by Lustig et al. (2000), the occurrence of a disability in the life of a person may disrupt the balance between demands and available resources (thus compromising life's manageability) and lead some people to experience their world as chaotic (thus compromising life's comprehensibility); therefore, it might be an idea for DSPs to assess students' SOC, for example by using the SOC scale (Antonovsky, 1993), and to consequently look for ways to strengthen their SOC. In any case, it is important for DSPs to be visible, or easily traceable (through social networks, the university's website, Facebook groups, and so forth), so that students know where to go when they need help.

With respect to possible ways to strengthen students' SOC, Super et al. (2015) suggested the stimulation of reflexive processes and empowerment. At the academic level, learning opportunities can be created by providing students with adequate preparation to actively and independently carry out a task (for example, training courses could be organized to help students to undertake a thesis project independently), or by adopting teaching methods that foster students' responsibility, encourage capacity building, and stim-

ulate students to identify and use the resources that are present within their group.

Finally, the adoption of a life course perspective allowed for the emergence of the importance of timing within salutogenic processes. This suggests not only that disability services and interventions should be provided from the beginning of each new educational level, but also that they should be provided as early as needed during the lives of people with disabilities.

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Table 1

Disability in Dutch Postsecondary Education

Students who reported having one or more disabilities in Dutch postsecondary education	Between 10 and 14% (Steenkamp, 2013)
Disabilities that university students perceive as the most hindering	Concentration problems, dyslexia, tiredness, mental health problems, and ADHD (Steenkamp, 2013)
Students with at least 150 study credits by the spring of their third year	31% among students with disabilities; 39% among students without disabilities (van den Broek et al., 2013)
College dropout rates	4% among students with disabilities; 2% among students without disabilities (van den Broek et al., 2013)

Table 2

Participants Recruited through each Sampling Strategy

Sampling strategies	Students reached	Students who participated
Self-selection sampling	13	7
Purposive sampling	4	2
Snowball sampling	3	2
Total number of students	20	11

Table 3

Participant Characteristics

Name	Type of disability	Acquired or congenital	Hidden or visible
Yoyo	Chronic tiredness	Acquired	Hidden
Flora	Chronic tiredness	Acquired	Hidden
Iris	Chronic tiredness	Acquired	Hidden
Anna	Mental health problems, chronic tiredness, and pain	Acquired	Hidden and visible
Marie	Chronic tiredness and pain	Acquired	Hidden and visible
Sarah	Concentration problems, chronic tiredness, and pain	Acquired	Hidden and visible
Claire	Chronic pain	Acquired	Hidden
Monika	Migraine	Acquired	Hidden
Claudia	Learning disability	Congenital	Hidden
Juliana	Mental health problems	Acquired	Hidden
Esther	Blindness	Congenital	Visible

Table 4

Participants' GRRs and SRRs

GRRs	Social network, care and understanding, advice, supportive environments; flexibility, persistence, awareness of one's own needs, limits and resources, and confidence in one's own skills/resources
SRRs	Aids and treatments (e.g., pain relief medication, guide dog to assist a visually impaired person to move around), institutional services (e.g., legislation, disability services) and disease awareness (—timely— knowledge of one's own disease, diagnosis, visibility)

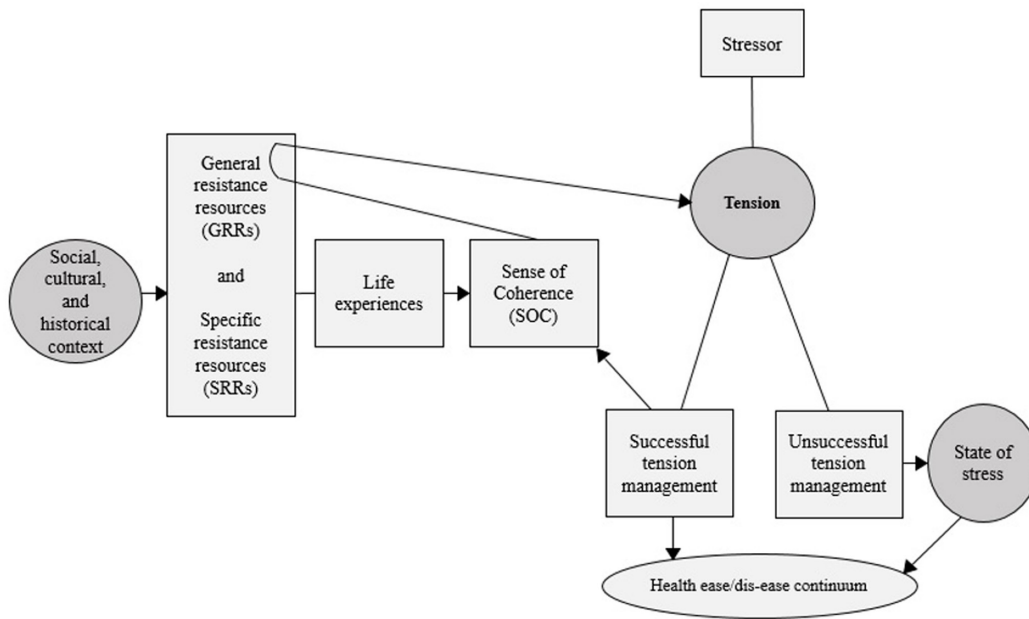


Figure 1. The salutogenic model of health (adapted from Antonovsky, 1979, pp. 184–185).

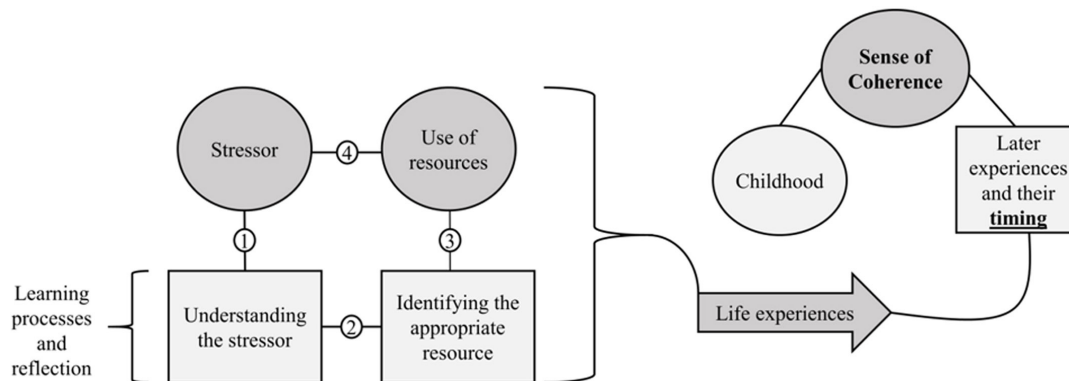


Figure 2. Visual description of the participants' salutogenic mechanisms. The numbers in the picture indicate the sequence of the steps leading to the identification and use of resources.

An Innovative Postsecondary Education Program for Students with Disabilities in STEM (Practice Brief)

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Abstract

Careers in the science, technology, engineering, and mathematics (STEM) fields have many benefits, including decent salaries, a strong employment outlook, and high job satisfaction. Unfortunately, workers with disabilities are underrepresented in the STEM fields. This practice brief describes a program designed to support college students with disabilities in STEM programs. The program, the Alabama Alliance for Students with Disabilities in Science, Technology, Engineering, and Mathematics (AASD-STEM), is a multicomponent program, with a major emphasis on mentoring, and is funded by the National Science Foundation. Preliminary program evaluation data highlighted positive changes in key attitudes and behavior related to STEM degree persistence and success for students participating in the AASD-STEM program.

Keywords: STEM, college students with disabilities, postsecondary programs for students with disabilities

The fields of science, technology, engineering, and mathematics (STEM) are critical to our global leadership and economy (Committee on Equal Opportunities in Science and Engineering [CEOSE], 2013). Employment opportunities in the STEM areas are expanding at a rapid rate. The U.S. STEM workforce surpassed 7.4 million workers in 2012; it is expected that the workforce will increase significantly through 2018, reaching an estimated 8.65 million workers (STEMconnector, 2012). The earnings of workers in many STEM fields are higher than non-STEM workers (Schiavelli, 2011), and there is a high level of job satisfaction of workers.

There is concern, however, that too few people are going in to STEM programs today (Terrell, 2007) and that currently the U.S. economy needs more workers who have high levels of knowledge and skills in STEM (Rothwell, 2014). One strategy to address this supply problem is increasing the number of students from underrepresented groups pursuing STEM (National Science Foundation, 2002, NSF). Persons with disabilities are considered an underrepresented group; in fact, it has been suggested they comprise one of the largest untapped pools of potential Amer-

ican engineers, mathematicians, scientists, technologists and technicians (CEOSE, 2006).

Problem

Even though the percentage of students with disabilities (SWD) enrolled in postsecondary STEM majors has increased, persons with disabilities continue to be underrepresented in STEM programs and careers (National Center for Science and Engineering Statistics, 2015). Barriers to STEM careers for persons with disabilities have been identified and include a range of factors from K-12 educational issues (e.g., lack of encouragement to pursue STEM based on stereotypes), employment issues (e.g., employers being less likely to hire workers with disabilities), and postsecondary education-related issues (e.g., low rates of individuals with disabilities earning a degree) (Alston, Bell, Hampton, 2002; Eriksson, Welanders, & Granlund, 2007; Madaus, Foley, McGuire, & Ruban, 2002; Price, Gerber, & Mulligan, 2007). Research addressing postsecondary education-related issues underscores the gaps in support services that create barriers for SWD in postsecondary education

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programs and the need to provide support and experiences that (a) help students develop self-efficacy, self-determination, and content knowledge; and (b) provide the opportunity to apply content knowledge (Dunn, Rabren, Russell, Massey, & Martin, 2014; Jenson, Petri, Day, Turman, & Duffy, 2011; Moon, Todd, Morton & Ivey, 2012).

The NSF's Research in Disabilities Education program has funded multiyear Alliances whose purpose is to increase the participation and achievement of SWD in associate, undergraduate, and graduate STEM programs, increasing the number entering the workforce (<https://www.washington.edu/doit/RDE/partners.html>). The focus of the Alliances vary. The Georgia STEM Accessibility Alliance's approach is using a virtual world as the primary service-delivery model, with the primary interventions including virtual mentoring and teaching, social networking, academic support, transition assistance, and preparation of instructors; whereas, the MIND Alliance for Minority Students with Disabilities in Science, Technology Engineering and Mathematics emphasizes a culturally sensitive student experience and career assessment and counseling approach as primary interventions.

Many of the projects are nearing the end of their support, and, as such there is limited data on the effectiveness of the various interventions. Ohio's STEM Ability Alliance has reported on the effectiveness of student learning communities, the primary intervention in their program (Izzo, Murray, Priest, & McArrell, 2011). Increases in self-determination, self-advocacy, and career development for students who participated in the learning communities were reported. The Pacific Alliance for Supporting Individuals with Disabilities in STEM Fields Partnership reported on five years of findings. The promising practices in their program were mentoring, academic support, and career-related experiences and support. The results indicated a high level of satisfaction with academic, mentoring, and career support. Short-term outcomes included increases in STEM interest and academic and career aspiration (Roberts, Takahashi, Park, Uyehara, & Brown, 2014). The purpose of this practice brief is to describe one of the NSF Alliance's postsecondary education programs designed to increase the quantity and success of SWD in STEM programs. Preliminary program evaluation data are provided.

Description of Practice

The Alabama Alliance for Students with Disabilities in Science, Technology, Engineering, and Math-

ematics (AASD-STEM) is comprised of five colleges and universities, and local school systems in central Alabama. Table 1 provides demographic information on the 247 students participating in the program since its inception in 2009 through 2016. The sample was predominantly from Auburn University (54.3%), White (53%), female (51.4%), and undergraduate (92.3%). In addition, participants were most likely to disclose their condition as Attention Deficit Disorder (ADD)/Attention Deficit Hyperactivity Disorder (ADHD) (26.3%) or as a systemic health/medical condition (21.1%). Finally, students were most likely enrolled in STEM programs related to the Biological/Life Sciences (32.8%) or Engineering (25.1%).

The AASD-STEM program is a multicomponent program, with a major emphasis on horizontal and vertical mentoring. Horizontal mentoring occurs twice a semester within three distinct groups (or bridges) and is facilitated by a faculty member, who also provides individual mentoring as needed. Vertical peer mentoring occurs with clusters of ten or fewer students across the bridges. Each cluster is facilitated by a Graduate Bridge mentor. Clusters meet at least once a week (see Table 2 for a more in-depth description of the Mentoring Bridge Model). Students are expected to participate in a minimum of two hours of mentoring activities each week. The project is overseen by a Principal Investigator, who is an Assistant Provost, and two Co-Principal Investigators from other participating institutions. Co-investigators come from a range of backgrounds (e.g., STEM fields, special education). While mentoring occurs at each individual institution, students from the different institutions have the opportunity to interact with each other via the annual Student Research Conference. Students also have the opportunity to participate in research internships. Table 3 describes additional program components.

Outcomes

The evaluation plan includes an internal and external evaluator. The internal evaluator focuses primarily on formative issues, providing feedback to the AASD-STEM partners about the implementation of project interventions; whereas, the external evaluator provides oversight on the process and is focused on outcomes and alliance-wide issues. The evaluation plan is designed to examine the extent to which the project components, called interventions, are implemented to achieve project goals. Information pertaining to students' interest in STEM, Alliance activities, self-advocacy behaviors, and self-efficacy was collected through surveys.

Student Surveys

Several surveys were designed to assess constructs related to student quality. More specifically, these surveys included measurement scales constructed to represent the constructs of interest in STEM careers, benefits of being involved in AASD, issues and challenges faced in college, self-advocacy knowledge and behaviors, academic efficacy, and intention to persist in their degree program (see table 4). Reliability estimates were very supported of these scales ranging from .617 to .931, with a median of .840. Student surveys were administered twice each year (fall and spring) since Fall 2011 to examine changes in students over each academic year. The following results are restricted to the first three full years of the program (2011-2014).

Results

Table 5 summarizes the responses of AASD-STEM participants who participated in the program over multiple years between Fall 2011 to Spring 2014. Changes were also examined with each academic year and will be reported in this section.

Changes within each academic year. In general, students reported their greatest improvements over the 2011-12 academic year, generally remaining stable the next two years.

2011-12. A matched sample of 76 students was used to examine changes over the 2011-12 academic year. Statistically significant changes ($p < .001$) were reported pertaining to students' ability to deal with issues and challenges faced in college and self-advocacy behaviors. More specifically, 94.7% of participating students indicated improvement in their use of effective self-advocacy skills and 88.2% in their ability to face issues and challenges. An increase in the ability to face issues and challenges pertaining to academic and social issues that confront them was reported by 94.7% and 89.3%, respectively. Also, over 80% of students reported increases in their ability to face issues and challenges pertaining to accommodations and disclosure, time management, social issues, and general college adjustment.

2012-13. The examination of a matched sample ($n=78$) of participants from the 2012-3 academic year, revealed that student quality generally remained stable. While average self-advocacy knowledge score declined somewhat in 2011-12, an increase occurred during 2012-13 with 69.2% of matched students' scores equal or better at the end of the year. AASD-STEM participants also reported being better able to face issues and challenges, with over 50% of them improving in all areas and over 60% when facing academic or accommodations/disclosure issues. Further-

more, over 60% of students reported improvements in terms of their academic self-efficacy and intention to persist in their current degree program.

2013-2014. Using a matched sample ($n=70$), the greatest improvement in 2013-14 was in the reported use of services provided through the Office for Students with Disabilities with 79.7% reporting increased use of such services. Consistent with the prior year, over 50% of students reported being better able to face challenges, with over 60% in relation to facing academic or accommodations and disclosure issues. Furthermore, over 70% of students reported improvements in terms of their academic self-efficacy, while 60% reported improved study skills and 50% reported increased intention to persist in their current degree program.

Changes over multiple years. Table 4 provides a summary of a matched sample of AASD-STEM participants from Fall 2011 to Spring 2014. These results are limited to the 11 measures of student quality that have been part of the project for a minimum of a two-year period. Matched data were available for 25 to 29 participants over this three-year period of time. Over 50% of these students reported improvement on each of the 11 student quality measures. This improvement was statistically significant ($p < .001$) for 8 of the 11 measures. One hundred percent (100%) of those students participating in the project over three years (2011-2014) reported improvements in use of self-advocacy behaviors. In addition, over 90% reported increased ability to face issues and challenges pertaining to academic and social issues, while over 75% of students reported being better able to deal with issues related to their accommodation and disclosure or time management issues. Furthermore, over 80% reported improved study skills behaviors and the use of services provided through the Office of Disability Services. Finally, 76% improved their knowledge of self-advocacy, and 67% reported increased levels of academic efficacy.

Implications and Portability

A serious issue relative to STEM advancement and education is the underrepresentation of SWD in STEM degrees and careers. In fact, the NSF has made increasing the number of persons with disabilities in STEM a national priority. Even though there are several limitations associated with preliminary project evaluation data, the results of this study are encouraging and have implications for future program development.

One potential limitation is the nature of surveys, which were used to collect much of the data. First,

these data were self-reported. Participant responses could have been influenced by the fact they received a stipend for program participation. Additionally, the program model includes several components. It is not possible from the survey results to identify which of the program components (e.g., mentoring, outreach activities) were most influential. Finally, the response rate ranged from 67% to 97% over the three academic years. While this is a good rate, perhaps those who completed the surveys were more invested in the program and more successful in their area of study. After the first year, to increase the response rate several of the institutions changed procedures for awarding stipends. Instead of awarding stipends at the beginning of the semester, stipends were awarded at the end of the semester, contingent on program evaluation completion.

A second limitation was the challenge of including a control group. As such, it is difficult to discern if the improvements experienced by program participants were actually a result of their participation in the program or consistent with typical skill improvement that occurs as students adjust to college. Researchers are challenged in finding control groups when working with special populations. The pool for potential control group students was greatly limited due to the limited number of eligible students at participating institutions. To be eligible, a student needed to have GPA of 2.7 and disclose his or her disability.

While the noted limitations should be considered when interpreting the results, the results are quite promising and provide direction for the development of programs to support SWD at the postsecondary level. The results highlighted positive changes in key attitudes and behavior related to STEM degree persistence and success for students participating in the AASD-STEM program, a program designed to support SWD in STEM programs.

The AASD-STEM program was designed specifically to facilitate increased academic and social integration to increase students' chances of persistence (Tinto, 1975) in STEM preparation programs and likelihood to enter STEM fields. To date, 66 students have graduated. Of those, 43% have secured jobs in STEM fields and 43% have continued on to graduate school. Five percent have obtained employment in non-STEM fields. Of all students who ever participated in the program, only one did not continue in the program due to lack of interest.

The areas of greatest improvement in student quality were not the STEM-related constructs; although, there were improvements in all of these areas too. The greatest areas of improvement were in participants' ability to handle challenges faced in college

across several areas, including accommodations and disclosure, time management, social and academic issues, as well as self-advocacy. While these are not STEM-specific, the literature has consistently identified these skills and attitudes as factors important to student success in postsecondary education settings (DO-IT, 2014; Dunn et al., 2014; Izzo et al., 2011).

The AASD-STEM program assumes that students admitted to STEM discipline programs have an aptitude for basic science and mathematics and are committed to STEM professions. Students who were struggling academically were provided support through tutoring, counseling, mentoring, and other means. However, attending to the social integration of students is likely just as important as the academic dimension and probably reinforces it. Previous research has shown that faculty mentors provide an important support and peers can provide guidance by example and serve as a resource for information about services, supports, advocacy (Stodden, Dorrick, Anderson, Heyer, & Acosta, 2005). As well, social and professional networks have the potential to strengthen achievement and interest in STEM endeavors (Izzo et al., 2011).

Future research should examine more specifically the impact of the different components of the program, perhaps identifying which components have the biggest impact on student success, which could then inform program refinement. As well, it would be noteworthy to examine the relationship between student characteristics and specific interventions.

In closing, postsecondary education support programs for students with disabilities need to be multidimensional. It is important to design programs that attend to both the social and academic needs of students (Tinto, 1975). By doing so, we increase the likelihood these students will persist and succeed in postsecondary programs, contributing to positive adult outcomes.

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Table 1

AASD-STEM Participant Demographics (247 Participants as of Spring 2016)

Participant Characteristic	Number	Percentage
Site/Institution:		
Auburn University (AU)	134	54.3
Tuskegee University (TU)	39	15.4
Alabama State University (ASU)	26	4.0
Auburn University at Montgomery (AUM)	38	10.5
Southern Union State Community College (SUSCC)	10	15.8
Sex:		
Male	120	48.6
Female	127	51.4
Race/Ethnicity:		
White	131	53.0
Black or African-American	92	37.2
Hispanic	10	4.0
Asian or Pacific Islander	7	2.8
American Indian/Alaska Native	1	0.4
Not Reported	6	2.4
Condition:		
Asperger's syndrome/autism spectrum disorder	7	2.8
Attention deficit disorder (ADD)/attention deficit hyperactivity disorder (ADHD)	65	26.3
Deaf or hard-of-hearing (D/HoH)	15	6.1
Physical impairment/orthopedic/mobility impairment	29	11.7
Systemic health/medical condition	52	21.1
Psychological/psychiatric condition	15	6.1
Learning disorder	28	11.3
Blind or visual impairment	8	3.2
Speech impairment	4	1.6
Acquired/traumatic brain injury	4	1.6
Other condition	20	8.1
Major (area):		
Architecture/Industrial Design	6	2.4
Biological/Life Sciences	81	32.8
Computer/Information Sciences	13	5.3
Engineering	62	25.1
Mathematics/Statistics	9	3.6
Physical Sciences	16	6.5
Psychology	39	15.8
Undeclared – Science & Math	21	8.5
Student Classification:		
Undergraduate	228	92.3
Graduate	19	7.7

Table 2

AASD-STEM Mentoring Model

Horizontal Mentoring	Vertical Mentoring
Three groups Bridge to Baccalaureate Peer Mentoring Program - Consists of freshmen and sophomores who plan to obtain a bachelor's or associate's degree in STEM disciplines - Meeting topics include time management, study skills, academic assistance resources, class registration advice, and mentoring - Goal for participants is to move in to the Bridge to Post Baccalaureate Program Bridge to Post-Baccalaureate Peer Mentoring Program - Consists of juniors and seniors who are pursuing a bachelor's degree in STEM disciplines - Meeting topics include co-op opportunities and research internships, class registration advice, and speakers from STEM disciplines, graduate school, industries, or government - Goal for participants is to move into the Graduate Bridge Peer Mentoring Program or join the STEM workforce Graduate Bridge Peer Mentoring Program - Consists of graduate students who have demonstrated a commitment to pursuing a doctorate in STEM fields - Meeting topics include conference presentations, applying for post-doc opportunities, scientific grant writing, and future faculty preparation - Goal for participants is to obtain a doctorate in a STEM discipline and join the STEM workforce - Faculty mentor facilitates Bridge meetings and provides additional individual mentoring	- Occurs with clusters of ten or fewer students across Bridges - Each cluster had a Graduate Bridge mentor who facilitates the vertical peer mentoring and serves a mentor for the Bridge to Post-Baccalaureate students - The Bridge to Post-Baccalaureate students serve as mentors to the Bridge to Baccalaureate students - Peer mentors provide support, encouragement, and information to their mentees - Clusters meet once a week in informal settings
Bridges meet separately the second and fourth month of each semester	

Table 3

AASD-STEM Program Components

Component	Description
Recruitment	Varies from institution to institution, but includes letters to parents of all entering freshmen and dissemination of applications through offices of disability services
Financial aid in the form of stipends and/or scholarships	- Students receive a stipend for program participation, dependent on active participation and maintaining a minimum required GPA \$2000/academic year for undergraduate students \$3500/academic year for graduate students
Continuous monitoring and assessment	- Students' grades, program participation levels, and progress toward degree completion are monitored - Students evaluate program, their participation in program, and their own personal growth two times a year
Research internships	- Undergraduate students spend eight weeks doing research with a STEM faculty member at a research lab on the campus of one of the AASD-STEM institutions - Participants have also participated in off-campus research labs at industry locations - Research areas have included a variety of topics in mechanical engineering, psychology, computer science, aerospace engineering, civil engineering, and biology - Students receive \$3,500 stipend for summer research participation 56 completed internships through summer 2014
Student advocacy group	- Open to all students, faculty, and staff and is not exclusive to those with disabilities - Called the "Students Enabling Students Association," monthly group meetings were held on the AU campus - Group members assisted with campus visits for high school students
Student research conference	- Occurs annually - Features research presentations by students, presentations by faculty members on STEM research areas, and breakout sessions on self-advocacy and the use of assistive technologies - The conference provides networking opportunities for faculty, students, and staff within the Alliance - Faculty members mentor students and provide guidance and support for students in preparation for research presentations
Research Presentations	- Students, particularly graduate students, were supported in their efforts to conduct research and present their findings at conferences - Over 120 presentations were given by students at regional and national conferences. - Presentation formats have included both oral and poster presentations
High school outreach	High school SWD tour postsecondary institutions to learn about STEM, the AASD-STEM project, financial aid, and disability services and interact with college SWD in STEM
Special seminars	- Special seminars are planned throughout the year depending on students' interests and needs - Topics such as summer research opportunities, graduate school admission processes, study skills, assistive technologies, etc. were integrated into monthly Bridge meetings

Table 4

Measurement Scales, Reliabilities, Definitions

Construct/Scale	Items	Reliability (Spring 14)	Description
STEM Interest ^a	6	.704*	Interest in an advanced degree in STEM and STEM careers.
Issues and Challenges ^a	24	.919	
Accommodations/Disclosure	4	.671	
Academic Needs	9	.859	
Time Management	3	.838	
Social Issues	8	.812	
Self-Advocacy			
Self-Advocacy Behaviors ^a	18	.840	Meeting with and making sure faculty are aware of necessary accommodations, knowing and using available resources
Self-Advocacy Knowledge ^b	20	.807	Office of Accessibility (Student Disabilities) services, ADA, self-advocacy knowledge
Academic Skills			
Academic Efficacy ^a	8	.925	Confidence in ability to succeed in classes and overcome academic challenges
Study Skills Behaviors ^a	16	.923	Making good use of study time, avoid procrastination and cramming, managing and prioritizing assignments.
Intent to Persist ^a	9	.931	Intentions to pursue additional coursework, complete degree program and work in STEM.

Note. *Not administered in Spring 2014, reliability reported for Spring 2013. ^a 5-point response scale,

^b multiple choice test

Table 5

Matched Sample (over multiple years in AASD-STEM)-Fall 2011-Spring 2014

Fall 2011-Spring 2014	Items	N	F 2011 Mean (SD)	SP 2014 Mean (SD)	Change (Matched)	Percent Improvement
Issues and Challenges ^a	24	29	2.89 (.16)	3.89 (.54)	+1.0*	100.0%
Accommodations and Disclosure	4	29	3.21 (.51)	3.81 (.78)	+.60*	82.8%
Academic Issues	9	29	2.82 (.32)	4.05 (.55)	+1.23*	96.6%
Time Management	3	29	2.48 (.60)	3.31 (.88)	+.83*	79.3%
Social Issues	8	29	2.74 (.25)	3.99 (.61)	+1.25*	96.6%
Self-Advocacy						
Self-Advocacy Behaviors ^a	18	25	2.20 (.37)	3.78 (.53)	+1.58*	100.0%
Self-Advocacy Knowledge ^b	20	25	76.6%	78.6%	+2.00%	76.0%
Academic Skills						
Academic Efficacy	8	27	4.23 (.55)	4.29 (.63)	+.06	67.0%
Study Skills Behaviors ^a	16	27	3.18 (.70)	3.57 (.76)	+.39*	81.5%
Fall 2012-Spring 2014	Items	N	F 2012 Mean (SD)	SP 2014 Mean (SD)	Change (Matched)	Percent Improvement
Disability Services – Planned or Used	14	35	1.54 (2.4)	3.89 (3.3)	+2.35*	82.9%
Intent to Persist	9	38	4.65 (.47)	4.55 (.89)	-.09	57.9%

Note. ^a 5-point scale, ^b multiple choice, * $p < .001$

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- **Participant Demographics and Institutional Partners/Resources:** Maintain the anonymity of the students, colleagues, and campus(es) discussed in the article but provide a clear demographic description of participants (e.g., number of students, disability type, gender, race and/or ethnicity whenever possible, age range if relevant) and the types of offices or agencies that were collaborative partners (if relevant).
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