Disability-Informed Graduate-Student Mentors Foster Co-Regulation for Undergraduates in STEM with Learning and Attention Disabilities

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Abstract

As young adults transition into adulthood they must develop effective self-regulation techniques to help them navigate the heightened expectations of independence placed upon them. During this challenging developmental stage, mentors and other supportive individuals can facilitate co-regulation processes that help young adults reach self-regulation. This qualitative research identifies and characterizes supportive processes of regulation that graduate student mentors engaged in as part of their mentorship interactions with undergraduate mentees with learning disabilities and attention-deficit hyperactivity disorder (LD/ADHD). Participants were part of a larger campus-based study with 52 undergraduate mentees with LD/ADHD and 57 graduate student mentors. Data were transcripts from mentor group meetings (N = 20) discussing LD/ADHD and the mentorship experiences, undergraduate group meetings (N = 13) discussing LD/ADHD experiences and supports, and an instrumental mentor case study. Structural coding was used to identify content related to mentorship experiences; process coding was used to describe the actions and roles undertaken by mentors; content analysis was used to examine relative salience of topics discussed during mentor group meetings. Four themes emerged describing the ways in which mentors acted as co-regulators for mentees including: Fostering Positive Relationships, Guidance Based on a Similar Path, Supporting Strategy Generation, and Supporting Mentees by Setting Limits. Findings highlight key actions and processes for effective co-regulation techniques used by disability-informed mentors, that support the self-regulation practices of undergraduate students with LD/ADHD to reach their educational, career, and personal goals.

Keywords: social support, resilience, young adults, self-regulation, graduate mentor

Background

Young adults with learning disabilities (LD) and attention deficit/hyperactivity disorder (ADHD) who are transitioning to new adult roles and contexts through college pathways face additional challenges to managing self and accessing appropriate supports within the college pathways (Kreider et al., 2015). LD, such as dyslexia, refers to a diverse group of neurodevelopmental conditions involving neurobiological differences that result in impaired academic learning and related difficulties in information processing, attention, memory, organization, and time management (American Psychiatric Association, 2013). ADHD is another high incidence neurodevelopmental condition whose primary symptoms manifest as persistent difficulties with sustained attention, hyperactivity, and/or impulsivity (American Psychiatric Association, 2013). LD and ADHD co-occur at a rate of almost 50% (DuPaul et al., 2013).

Beyond the co-occurrence of the LD and ADHD conditions, both conditions are characterized by overlapping symptom manifestations in the executive functioning areas of attention control, working

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memory, inhibition, and cognitive flexibility (Barkley, 1997; Varvara et al., 2014); as such, LD/ADHD is used herein. The core executive functions of the brain that are challenged in LD/ADHD are also the executive functions that are foundational to self-regulation (Hofmann et al., 2012). Self-regulation refers to the ability to manage behaviors and emotions to foster well-being and success toward desired goals (Murray & Rosanbalm, 2017).

Young adults with LD/ADHD attend four-year colleges at rate about half that of the general population (21% compared to 40%) and have lower postsecondary completion rates than those without disabilities (Cortiella & Horowitz, 2014; Hechtman et al., 2016; Kuriyan et al., 2013). When in college, undergraduates with LD/ADHD face challenges in accessing academic accommodations (McGregor et al., 2016), managing nonacademic responsibilities (McGregor et al., 2016; Wolf, 2006), have a higher risk of emotional challenges (DuPaul et al., 2017), and participate in fewer academic activities than their peers (DuPaul et al., 2017). For students with LD/ADHD, challenges while in college can impact psychosocial health, college success, and ultimately, life course trajectory (Gerber, 2012; Masten, 2009; Murray & Rosanbalm, 2017).

Academic success for college students with LD/ADHD pursuing a science, technology, engineering, or math (STEM) field of study can be additionally challenged by both the nature of STEM education and the environment within STEM classrooms. College students in STEM with high incidence invisible disabilities, such as LD and ADHD, report barriers that arise from STEM faculty and peer behaviors, as well as curricular structures, such as lockstep required course sequences taught across interrelated programs (Friedensen et al., 2021). STEM faculty report having a poor understanding of disabilities and little guidance regarding how to support their students with disabilities within what is perceived as rigorous and demanding fields of study (Bettencourt et al., 2018), and are less receptive to requests for academic accommodations (Bettencourt et al., 2018; Riggs, 2022). Peer-driven hyper-competitive STEM atmospheres serve as additional environmental challenges for students with LD/ADHD (Bettencourt et al., 2018), whose self-regulation symptom manifestations can include challenges in regulating emotional state (Lagacé-Leblanc et al., 2022). As such, being enrolled in STEM for students with LD/ADHD can compound self-regulation challenges experienced by young people transitioning to new adult roles and contexts.

The transition to adulthood for college students entails learning to manage academic demands, college life, and the developmental expectations of young adulthood. Expectations of young adulthood entails learning to manage one's daily life, health, finances, and independent living while also navigating ambiguities in their social roles and exploring potential career and life paths (Arnett, 2006). This transitionary phase requires young people with disabilities to also garner the supports needed to manage their disabling condition while learning to navigate their new adult roles and contexts (Kreider et al., 2015), which are key for successfully meeting personal and societal expectations (Masten, 2009). For college students with disabilities, these developmental expectations extend to learning to manage disability-related challenges within both academic and everyday life contexts of young adulthood (Kreider et al., 2015).

Self-regulation is a critical skill for meeting expectations related to both college demands (Ommundsen et al., 2005) and young adulthood's new and continually evolving roles and contexts (Murray & Rosanbalm, 2017). Self-regulation requires abilities to manage emotions, thought processes, and actions to persist and achieve goals, even during stressful situations (Murray et al., 2015). Students with LD/ADHD are challenged in learning to self-regulate actions, emotions, and/or thoughts toward meeting academic and professional development goals and performance expectations (Butler, 1998; H. Schunk & K. Dibenedetto, 2022; Major et al., 2013). For young adults with LD/ADHD, supportive relationships with others, such as those offering co-regulation support, can facilitate the development and implementation of critical self-regulation skills (Murray & Rosanbalm, 2017).

Co-regulation refers to processes used by a supportive individual to assist a younger person in adjusting responses to situations and demands in order to self-regulate and maintain goal-directed behavior (Murray & Rosanbalm, 2017). For young adults, co-regulators can be supportive adults such as coaches, parents, or mentors that support the skills needed for increased independence, self-regulation, and for building resilience (Murray et al., 2015). Typical actions of individuals that function as co-regulators include providing a warm relationship, creating a welcoming environment, and providing instruction within the specific contexts of the young person's life (Murray et al., 2015).

Mentors within their supportive interactions, can help young people learn to self-regulate when coping with new and/or challenging situations, such as when a mentor guides a student in reflecting on potential

strategies or avenues for addressing a challenge. Mentorship entails the development of a dynamically collaborative relationship where mentors provide advising through role modeling, career guidance, skill development, sponsorship, and psychosocial and emotional support (National Academies of Sciences & Medicine, 2019). Mentoring practices are common on college campuses and are one type of support that can foster problem-solving abilities for students with LD/ADHD (Kreider, Medina, & Koedam, 2021).

Key aspects of mentorship for college students with disabilities extend beyond guidance on accessing needed supports; mentorship must also include guidance and coping strategies for navigating the experience of being an individual with a disability (Brown et al., 2010). Contemporary mentorship for neurodiverse college students typically entails individualized one-on-one support from a trained peer who supports academic skills and the transition to college life (Ames et al., 2016; Rando et al., 2016). Peer mentorship programs are also emerging on college campuses for students with autism and report positive outcomes in social skills, academic performance, and sense of belonging (Duerksen et al., 2021).

The term "disability-informed mentorship" refers to mentorship by which mentors, as part of their mentorship, actively grow in their understanding of the mentee's LD/ADHD condition and experiences (Kreider et al., 2018). These mentors, who were supported and informed by campus personnel with expertise in LD/ADHD, have demonstrated potential to help students with LD/ADHD develop self-regulation abilities within a college environment (Kreider et al., 2018). While mentorship has been linked to positive impacts on college students' academic achievement, professional development, and persistence within higher education (Coles, 2011), sparse research informs as to how mentorship can facilitate self-regulation for young adults with LD/ADHD. As demonstrated by prior research on disability-informed mentorship, co-regulation through mentorship is a valuable practice in supporting students with LD/ADHD (Kreider et al., 2018, 2021).

This study's purpose was to examine the types of social supports that disability-informed graduate student mentors provided to undergraduate mentees with LD/ADHD. Specifically, we wanted to understand the types of supports that helped mentees self-regulate emotions, cognitions, and actions to persist towards the mentee's goals. Study aims were to (a) identify and characterize the interactions that mentors engaged in as part of their process in supporting the co-regulation needs of undergraduate student mentees with LD/ADHD, and (b) explore the process by which mentors addressed the disability-related needs of their undergraduate mentees.

Methods

Design

This study is a qualitative descriptive design (Vaismoradi et al., 2013, 2016) using secondary data analysis to examine experiences of co-regulation support provided by graduate student mentors.

Brief Description of the Parent Study

The data for this analysis came from a larger four-year study that developed, implemented, and tested a holistic (i.e., academic and psychosocial) multi-level (i.e., personal, interpersonal, institutional) model of coordinated campus-based supports for undergraduate students with LD/ADHD (Kreider et al., 2018). At the personal level, undergraduates with LD/ADHD participated in group meetings (1-2 hours long) in which didactic presentations were provided, followed by facilitated discussions focused on participants' experiences specific to the topic. Topics centered on academic and career, understanding the LD/ADHD condition, health and wellness, stress and time management, and communication. Undergraduates also participated in biweekly meetings with assigned graduate student mentors for the purpose of professional development within their chosen field of study.

At the interpersonal level, graduate students were matched to their undergraduate mentee with LD/ADHD based on the mentee's field of study. Graduate student mentors met as a group two to three times a semester for approximately one hour to receive support from members of the research team with disability and STEM expertise. Topical information provided to the mentors included education about LD/ADHD, universal design for learning, academic accommodations, and campus-based resources available for students with LD/ADHD. Mentor group meetings also involved abbreviated topical content provided during the undergraduate mentee group meetings and facilitated discussions regarding their mentorship experiences and understanding of the LD/ADHD condition. These group meetings also served as a forum for mentors to ask questions regarding their mentorship or ask disability- related questions. These group meetings also functioned as a forum for mentors to share strategies regarding LD/ADHD-related challenges encountered during their mentorship process.

At the institutional level, a Partnership Council among various academic and health units across campus was created to discuss and implement campus-based supports for students with LD/ADHD. This paper focuses on the interpersonal processes used within the mentorship supports developed for the interpersonal level of the parent study.

Participants

Participants were 52 undergraduates with LD/ADHD and 57 graduate student mentors (Table 1). Undergraduates were aged 21.2 ± 3.5 years of whom, 22 (42%) reported LD, 18 (35%) reported ADHD, and 12 (23%) reported co-occurring LD and ADHD. The undergraduate sample included 1 freshman, 16 sophomores, 27 juniors, and 8 seniors at the time of study enrollment. Undergraduates were eligible to enroll in the study if they were (a) registered with the campus disability office and eligible to receive accommodations related to an LD/ADHD, (b) available to participate in the study for two academic years (four consecutive non-summer semesters), and (c) enrolled in a science, technology, engineering, mathematics, or social, behavioral, or economic sciences field of study (STEM).

Purposive sampling was used to enroll graduate student mentors. PhD students were sought unless the pool of potential PhD students was limited in a specific STEM field of study. Graduate students were eligible to participate if (a) they were pursuing a graduate degree within a STEM field of study, (b) they had at least two years of remaining graduate studies at the University of Florida, and (c) an undergraduate participant in a similar STEM field was already enrolled in the study. Graduate students were not expected to have a disability or understanding of disabilities. Graduate student mentors were recruited from the University's graduate school, graduate program listservs, and word of mouth.

Most undergraduates and graduate student mentors were compensated for each semester of active participation in study activities. Participants who were not compensated were one undergraduate mentee and five graduate student mentors. These participants were prohibited from receiving compensation due to international student visa restrictions but chose to participate despite forgoing compensation.

Written informed consent was obtained from all graduate student mentors and undergraduate mentees prior to engagement in study activities. All study activities occurred at the University of Florida, with oversight provided by the University's Health Science Center Institutional Review Board.

Data Sources and Analysis

Data from mentor group meetings and undergraduate group meetings were collected via audio recording and written responses from participants. All audio recordings were transcribed verbatim for qualitative data analysis. Qualitative examination of data from the parent study that related to the mentorship process and experiences were used to understand the mentoring relationship. Data were transcripts from mentor group meetings (n = 20); transcripts from undergraduate mentee group meetings (n = 30), of which 13 contained textual segments regarding mentorship experiences; and an instrumental case study of one mentor's experience in implementing mentorship support. A thematic analysis was used to explore how mentors acted as co-regulators within the larger study's mentorship activities. Data from mentor group meetings and undergraduate mentee group meetings were analyzed for patterns and themes regarding mentors' roles and how mentorship roles were related to constructs associated with co-regulation as defined by Murray and colleagues in their 2015 seminal report informing on toxic stress and self-regulation from a developmental perspective (Murray et al., 2015). Structural coding, which entails categorizing data representing a specific topic, was used to identify data segments within mentor and undergraduate group meetings related to participants' mentorship experiences (Saldaña, 2013).

Afterwards, an initial deductive coding approach was implemented in which data were again structurally coded, this time for general categories related to the co-regulation skills mentors can implement to support young adults (Murray & Rosanbalm, 2017). Specifically, text pertaining to (1) mentees helping mentors understand about their LD/ADHD, (2) actions or conversations within the mentorship that addressed LD/ADHD concerns, and (3) mentors helping mentees manage or understand (a) LD/ADHD-related challenges; (b) emotions around LD/ADHD; (c) thoughts about LD/ADHD-related experiences, problem-solving, strategy development, and planning; and (d) expectations and actions around follow through and accountability, such as timeliness within the mentorship relationship or other personal and professional development situations.

Process coding, whereby participants actions are labeled, was then used to code the continual actions, roles, and emotions that mentors implemented within the mentor-mentee relationship with a focus on mentors' responses to difficult or triggering situations within the relationship (Saldaña, 2013). Process coding yielded conceptual understanding of role-related constructs of co-regulation used by mentors in supporting mentees (i.e., themes) and nuanced descriptions of mentorship roles and actions (i.e., subthemes) (Charmaz, 2014). Finally, axial coding was used to further explicate and describe the dimensions and contexts in which mentorship support was provided (Saldaña, 2013).

Following identification of conceptual themes and subthemes, categorizations were triangulated with data from an instrumental case study (Grandy, 2010).

Table 1

Participant Demographics

Participants [*n*]	**Gender *n* (%)**	**Race *n* (%)**	**Ethnicity *n* (%)**	**Mean Age (*SD*)**	**Field of Study *n* (%)**
Undergraduates with LD [52]	Male 26 (50) Female 24 (46) Not reported 2 (4)	White 37 (71) Black 8 (15) Asian 1 (2) Other[β] 4 (8) Not reported 2 (4)	Hispanic 9 (17) Non-Hispanic 26 (50) Not reported 17 (33)	21.2 (3.5)*	Physical/Biological Sciences[☼] 22 (38) Social/Behavioral/Economic Sciences 17 (30) Technology 1 (2) Engineering 15 (26) Mathematics 2 (4)
Graduate student mentors [57]	Male 28 (49) Female 28 (49) Not reported 1 (2)	White 29 (50) Black 6 (11) Asian 13 (22) Other[β] 3 (5) Not reported 6 (11)	Hispanic 5 (9) Non-Hispanic 39 (68) Not reported 13 (23)	24.5 (4.7)[&]	Physical/Biological Sciences 20 (38) Social/Behavioral/Economic Sciences 14 (27) Technology 3 (6) Engineering 12 (23) Mathematics 3 (6)

Note. **n* = 51; [☼] includes chemistry, physics, astronomy, earth/ocean/atmospheric, agricultural, environmental, life, health science, [β] "Other" categorical responses were either ethnicity or mixed-race responses, [&] *n* = 46

The case study was written as a reflective response to a written query regarding a mentor's overall mentorship experience within the study. This step enabled verification of the identified mentorship roles and provided relevant illustrative quotations that further corroborated themes and subthemes (Creswell, 1998).

Following the thematic analysis and code reduction, a content analysis was used to quantify if each identified role and related actions were discussed within the 20 mentor group meetings. Each action was treated as a binary variable and tallied; a value of 0 or 1 (0 = not discussed within the meeting; 1 = yes, discussed within the meeting) was used to index whether the role-related action was discussed during each meeting. Descriptive statistics were used to characterize the frequency of the role-related actions.

NVivo 12 Pro qualitative data analysis software (QSR International Pty Ltd., 2018) was used to aid in organizing codes and conceptual categories. Rigor was enhanced through constant comparison of the data to emerging findings, peer debriefing, discussion of findings among team members, and presentation of findings at local conferences.

Results

Four themes emerged from the data that describe the primary tasks and mentorship roles that mentors engaged in when serving as co-regulators to their undergraduate mentees. These themes were (a) *Fostering Positive Relationships,* (b) *Guidance Based on a Similar Path,* (c) *Supporting Strategy Generation,* and (d) *Supporting Mentees by Setting Limits.* During the mentor group meetings, the topics most often discussed were mentors' experiences around fostering positive relationships (i.e., n = 17 mentor group meetings; 85%; Table 2) and the provision of guidance, which was primarily based on mentors' own experiences (i.e., n = 17 mentor group meetings; 85%; Table 2).

A total of nine sub-themes were identified that represent key mentor role-related actions in providing mentees' co-regulation. Key actions/sub-themes included (a) Emotional Support [Theme 1], (b) Establishing Trust [Theme 1], (c) Creating a Safe Space [Theme 1], (d) Advice Based on own Experience [Theme 2], (e) Professional Direction [Theme 2], (f) Co-creating Solutions [Theme 3], (g) Suggesting Strategies [Theme 3], (h) Accountability [Theme 4], and (i) Linking to Other Resources [Theme 4].

Provision of emotional support was discussed in the greatest number of mentor group meetings (n = 16; 80%; Table 2), with advising that was based on mentors' personal experience as the second most frequently discussed (n =15; 75%; Table 2).

Mentors, in their disability-informed mentorship, provided mentorship that was targeted toward helping mentees cope, leverage strengths, and progress toward goals across the breadth of the mentee's roles and contexts. Within their process of addressing disability-related needs, providing emotional support was the priority; it served to create a safe and trusting mentoring relationship whereby mentees could begin to describe personal challenges as well as disability-related symptoms and impacts. In learning about their mentees and their specific LD/ADHD experiences, mentors also learned about mentees' strengths, which enabled them to provide targeted guidance and strategies that were anchored in the mentee's strengths and interests. Additionally, throughout mentors' two-year relationship with mentees, the mentors were supported through mentor group meetings. These meetings fostered contextualized and progressively deepened understanding of their specific mentee's LD/ADHD experiences. As such, mentors supported the whole student, whereby they considered not only their mentees' academic and career development goals and challenges, but also their mentees' social, daily, and personal health and wellness expectations.

Theme 1: Fostering Positive Relationships

Mentors worked toward ensuring a responsive mentor-mentee relationship through the provision of sensitive, disability-informed, and timely emotional response. This was supported through emotional support, establishment of trust, and creation of a safe space where the mentee was comfortable sharing experiences, including disability experiences, and everyday challenges.

From the mentees' perspective, many described the benefits of having a mentor as a trusted confidant that they could turn to for help in navigating current and/or new situations and planning for life transitions and anticipated future situations. As shared by one mentee:

> To just be there and be like a sounding board to every big life decision that I had to contemplate. Being able to have that one-on-one conversation…it really makes you feel like you're part of a community of people that you can go to, that you trust…I don't think I would've made it this far without the help of my one mentor and everyone here [within the mentee group meetings]. (U19)

Emotional Support

Central to the mentor-mentee relationships were the mentors' encouragement; recognition of mentees' challenges, achievements, and hard work; and validation of the mentees' experiences and emotions. Mentors listened to their mentees, continually assessed

Table 2

Roles Assumed by Graduate Student Mentors in Mentoring Undergraduates with Learning and Attention Disorders

Themes & Subthemes	Description	Number of mentor meetings discussed within*	Validation quotation from instrumental case study
Fostering Positive Relationships	How mentors create relationships with their mentees that are approachable and forthcoming for students with LD/ADHD[&]	17	n/a[☼]
Emotional Support	Validate mentee's emotions and encourage them through difficult situations (e.g., providing encouragement, motivation, being a good listener, looking out for mentee's wellbeing, validating mentee's feelings)	16	"We frequently discussed how to adjust social skills for different settings and how to discuss learning disabilities with friends."
Establishing Trust	Foster a trusting relationship with mentees (e.g., Building rapport, trust, learning mentee's strengths and weaknesses, getting to know each other)	12	"After the first few meetings once … the students found me to not only be a mentor but a friend, our conversations shifted towards how the students struggled in social settings."
Creating a Safe Space	Establish a relationship in which both the mentor and mentee feel comfortable disclosing information about themselves (e.g., difficulties they have faced)	6	"Often, our conversations were casual, and the students felt they could discuss any issues with me as if they were talking to a friend."
Guidance Based on a Similar Path	How mentors encourage and directe mentees based on their own personal experiences combined with LD/ADHD-related understanding	17	n/a
Advice Based on own Experience	Provide guidance and share personal experiences to assist mentees in navigating their own path (e.g., class recommendations, referring to helpful resources on campus, providing examples of schedules, leading by example)	15	"In asking such questions [prompting mentee] we can… explain concepts in a way that works for the student but also help the student identify how to be successful in all courses."
Professional Direction	Suggest ways to get more involved within STEM discipline (e.g., research, curriculum, networking, prepping for post-graduation)	8	"Generally, the students did not want a mentor to fix problems or tutor them but…help them navigate college life and initiate life after college."

(Table 2, continued)

Themes & Subthemes	Description	Number of mentor meetings discussed within*	Validation quotation from instrumental case study
Supporting Strategy Generation	How mentors support their mentee in discovering helpful solutions to challenges encountered by mentees across aspects of mentee's life	9	n/a
Co-creating Solutions	Work together to generate solutions for issues that arise in the mentee's everyday life (e.g., helping mentees keep up with social networks, how to approach professors, time management strategies)	7	"Together we were able to develop a method for creating a to do list that was empowering and helped make decisions on what they have time to do and what they do not have time for."
Suggesting Strategies	Provide explicit directions or specifications about how to address challenges faced (e.g., providing planners, instructing to engage in a specific time management strategy)	4	"Although most students struggled staying organized and completing tasks on time… we at least developed a method which could be modified throughout the mentoring process."
Supporting Mentees by Setting Limits	How mentors recognize and set limits to help mentees overcome disability-related challenges and maintain a productive mentorship relationship	11	n/a
Accountability	When mentors set expectations for follow-through and then support mentees' abilities to improve follow-through	9	"One of my most important roles as a mentor was to assist in… responding to feedback."
Linking to Other Resources	Identify ways that mentees could be better supported outside the scope of the mentorship; mentors acknowledge that they cannot do things for the mentees such as talk to instructors about accommodations	4	"As a mentor, I was excited to learn about all the resources available to these students… I was surprised to find that the students I mentored were not interested in these resources as much as they were interested in our hour-long meetings each week."

Note. **n* = 20 mentor meetings; [&]Learning disabilities and attention-hyperactivity disorder; [☼]n/a = not applicable, representative quotations are aligned with sub-themes.

how the mentees were feeling and helped identify (i.e., name and contextualize) the specific challenges mentees were facing to provide emotional support. Mentors, through the affordance of a responsive relationship, attuned to their mentees' experiences and helped their mentees identify, articulate, and contextualize their disability-related experiences. This emotional support served to help mentees remain regulated and persist through their challenges, as described below by one mentor:

> I have to be a sounding board–first to see where she's at...I listen to what she's talking about… things keep popping up in her conversation where you can…pick up that's what they're struggling with right now or that's a potential issue their having. (MM8)

For the mentors, this included consideration of their undergraduate mentees' personal well-being and assisting them in understanding their potential, acknowledging their hard work and helping them gain confidence in their abilities or potential as a student with LD/ADHD. As shared by one mentor,

> [My mentee has] gotten to the point where she's comfortable telling me about her grades...she said last semester was the best semester she's ever had and so I was really…supportive of that and just brought her... a cupcake to be like, "That's awesome congratulations!" And now she feels I'm that support system for her that…if she does well on a test…she sends me pictures of her tests…So like, I think just having found a way to be supporting of her…when she does something good…has helped for her to feel more empowered...giving her that acknowledgement that I'm not sure she ever really received being an LD student...I see a huge change in her…gaining more confidence and more empowerment from just my acknowledging her successes. (MM9)

Establishing Trust

Mentors spoke of working toward creating relationships that were anchored in trust and confidentiality. As such, mentors served as being someone that their mentees could confide in. For example, one mentor stated, "When she is having trouble with a teacher, she can openly communicate her frustrations with me knowing that I would never share that information with anyone" (MM13).

The process for establishing trust began by learning about LD/ADHD and getting to know the personality, interests, and strengths of their mentees. This was often very meaningful for the mentees, as shared by one mentee:

> The last time I met with my mentor she actually kind of interviewed me and wrote down how my LD affects me in school. And I told her how it affected me, I told her how it affects every facet of my life and how it affected me, and she wrote everything down... I thought that was cool... I guess she just wanted to know to like help understand more. (U32)

Establishing trust was required prior to mentees' feeling comfortable in disclosing LD/ADHD struggles and challenges with their mentor. Thus, establishing trust was a foundational building block for creating a safe space for the mentee within the relationship.

Creating a Safe Space

Overall, mentors understood the importance of assuring mentees of utmost confidentiality in what is shared within the mentorship relationship. Mentors also spoke of the importance of conveying to their mentee their commitment to better understanding both the LD/ADHD conditions and to understanding their mentees' disability-related experiences. This commitment served to counter mentees' feelings of internalized stigma within the relationship. As expressed by one mentor,

> I think it's important to emphasize to scholars [i.e., mentees] that they aren't a failure or are weak if they need to request extra time [as part of their disability accommodation]. It seems as if sometimes these cognitive distortions can get in the way of a scholar requesting what they need. By reassuring them that such an accommodation isn't a failure, and discussing the reasons those thoughts originally occurred in the first place, we can reframe their mindset. Once they feel that they deserve this time, it will be easier [for them] to actually request this [extra] time. (M92)

Mentors' commitment to learning about LD/ADHD and how disability-related challenges manifested within the context of the mentorship interactions also served to prevent potential enactments or perceived stigma enactments within the mentorship relationship. One mentor reported the following:

> It's very rewarding being a mentor and learning through the whole process, and seeing everything through someone who has an LD, with their perspective in regards to everything…What I was

> surprised at, is that the response…even though it took a little longer to help my scholar [i.e. mentee] get organized and work with stress management and get to some of the proper resources and stuff, they responded to it really well. I've seen improvement…over the course of the year…, which leads me to one of my tips: …just bring up points repeatedly, not just because they have an LD, but to help them understand the concept. (MM11)

Some mentors described intentionally communicating with their mentees in an informal and friendly manner rather than a professional one so as to create a comfortable space at the beginning of the relationship. As stated by one mentor, "A friend rather than a superior is exactly what these students needed" (MM8). This communication style, in combination with mentor's commitment to maintaining confidentiality and learning about the LD/ADHD, aided in creating an environment where mentees could feel safe in freely talking to their mentors about academic and other life challenges and thus strengthening their relationship.

Having a safe space within the mentorship allowed mentees to feel as if they could go to their mentors for guidance and support beyond academic and professional concerns; they could reach out to their mentors for support regarding all aspects of their lives. One mentor described this support as follows:

> It's important to me that I am able to help him if he has any issues outside of school that he is willing to share with me. Recently my scholar [i.e., mentee] was having issues with the healthcare center this semester, so many of our meetings have been spent discussing the best way to resolve these issues and what he could do in the future to hopefully prevent them. (M56)

As part of building connections with mentees, several mentors reported sharing their own personal strengths and challenges. This served to foster a space where vulnerabilities were acknowledged without judgment, and where the mentee was able to feel heard and validated. One mentor shared the following:

> My scholar [i.e., mentee] and I have a great relationship. We have really bonded and will likely keep in touch after the program has ended. I think opening up about your own struggles, without making [mentoring] sessions about you, is really helpful. I think sharing personal stories and how you overcame those problems is really helpful. (M68)

Theme 2: Guidance Based on a Similar Path

The Guidance Based on a Similar Path theme describes how mentors integrated their emerging LD/ADHD-related understandings with their own personal experiences to better assist their mentees; often these personal experiences were based on having undergone a similar college education path. One mentor described this experience as follows:

> We share a lot of the same teachers because I attended undergraduate school at University of Florida as well. Therefore, when she needs to vent about a teacher or a project being hard, I can relate and truly say "I understand what you mean" or "I remember how I struggled with that project" (M68)

Advice Based on Own Experience

Guiding undergraduate mentees within the mentorship included providing both academic and personal advice, as well as professional guidance. Mentees sought guidance around the whole college experience and did not limit points of advice to only academic or STEM-related topics. Advice extended to dealing with challenges surrounding participating in, and the balancing of, interests, hobbies, and everyday life within the context of being a college student. Mentors often drew from their experiences as undergraduate students. Additionally, for some, mentors' personal stories served to illustrate for mentees alternative strategies or potential paths that the mentee may have not yet considered. As one mentor described,

> I think my mentee really liked to hear that I took a year off between undergrad and grad school. She didn't explicitly say it, but I think that [she] just kinda [liked] the concept of "You don't have to do this to be successful, [that] there are instances, probably from your perspective, I've failed in life at times, but it's still working" I think that was kind of a welcomed…pressure release [for her] (MM13)

Mentors also shared with mentees their own strategies for managing time and studying, as well as tips for how to access resources that were helpful for them. Mentors highlighted the importance of giving mentees general guidance based on their own experience while also ensuring that the mentees were making choices that best benefited themselves and that were supportive for their LD/ADHD-related strengths and challenges. One mentor explained this support as follows:

> A mentor is a teacher...we are helping them not necessarily go down our path but go down a path that we were once on…we are not leading them down a path. We are just helping them navigate their own path. (MM9).

Mentors reported assisting their mentees in identifying potential extracurricular activities that could be helpful in advancing their undergraduate studies in preparing for future careers or further education. One mentor highlighted the following

> We spend a lot of time talking about…organizations that getting involved with would help with… characteristics that they [graduate schools] look for…she just wanted [advice] on…what would be the best experience and would help further her the most (MM8).

Professional Direction

Undergraduate mentees highlighted how helpful it was to have a graduate student mentor that had been through a similar college pathway. As such, mentors could assist them in planning for their anticipated careers. From one mentee, "[my mentor] has given me some good advice about where I can go professionally in the future" (U20).

Mentors reported focusing discussion topics within the mentorship on mentees' professional identity development within their shared fields of study. This entailed identifying professional goals, suggesting helpful seminars, and, when applicable, preparing for graduate school. Mentors often offered practical advice that the mentee may not have otherwise understood or picked up on due to lacking awareness of professional etiquette or a naivety about the profession. As described by one mentor,

> My mentee had an interview recently and I was like, "Oh by the way, at interview you want to act like this; don't show up in jeans"…[we talked about] how to buy a suit, and how to act at a conference, and what to expect…[when] networking, and…you can give them a little bit of insight. (MM9)

Theme 3: Supporting Strategy Generation

Mentors described a wide range of challenges that mentees sought guidance for in the areas of daily life, academics, social life, and emotional struggles. Rather than providing advice, some mentors created opportunities for mentees to brainstorm potential solutions and strategies. Other times, mentors used the approach of suggesting strategies that could be personalized by the mentees in efforts to work with their mentee in practicing problem-solving through challenging situations.

Co-creating Solutions

Mentors collaborated with their mentees to generate solutions for challenges that mentees shared with them. Mentors described assisting in the generation of strategies using their own personal experiences, their emerging understanding of LD/ADHD, and insight from their mentees. As reported by one mentor,

> [Mentee's situation] makes employing stress management techniques - such as physical exercise – challenging, and it was necessary to explore different methods that accommodated his limitations. I think discussions of alternative methods were edifying for both of us, and it particularly helped me to look at things from a different perspective and challenge my thinking. (M94)

Mentors facilitated mentees' identification and framing of personal strengths. A strengths-based approach was used as a starting point for creating strategies that leveraged strengths and thus potentiated success and were judged to have greater potential for carry over into other areas of the mentee's life. One mentor shared the process they used,

> Ultimately the scholar [i.e., mentee] is the expert on their life. Thus, they know what works for them and what doesn't work. As a result, it's important to suggest that they cultivate strategies that play to their strengths rather than force something on them that will cause them to fail…Second, building from these strengths, it would be helpful to identify time management strategies that will be more likely to be employed given the…strengths. (M92)

Mentors drew upon their own strategies and collaborated with their mentees to personalize the strategies as a strategy for determining the best fit for the mentees' specific situations. One mentor described this process as,

> Showing my [mentee] my strategies and seeing how she does hers. This way we can combine the best of both of our plans to come up with the best strategy for her...After coming up with the best strategies. I consistently ask how her work is going. (M68).

Following up with mentees to see how the strategies were working was an important aspect in the process

for supporting both the mentees' LD/ADHD symptomology and mentees' follow-through with strategy use. Mentors reported not only supporting the mentees' problem-solving ability for current situations, but also in thinking about how to problem solve for future situations. One mentee stated the following:

> I learned so much from my mentor and she helped me make decisions about school and my future. She gave me multiple tips on what my future career would be like and I am lucky to have someone I can call whenever I have questions. (U26)

Suggesting Strategies

In addition to co-creating potential solutions, mentors at times suggested strategies they thought may be helpful; suggestions came from personal experience as well as strategies that mentors sought out. Mentors shared strategies across a broad range of areas to include providing potential solutions for time management challenges, communication difficulties, and helpful campus resources for promoting health and wellness. One mentor described needing to offer mentee strategies for overcoming social challenges that the mentor had not anticipated would be problematic:

> I was not expecting my mentorship to play such a pivotal role in social aspects of life. We frequently discussed struggles with roommates and not understanding roles in a roommate relationship. For example, some students [i.e., mentees] did not understand the difference in living with friends versus attending a social gathering (picnic, party, etc.). (M80)

At times, mentors were able to predict mentees' obstacles and provide ideas for specific strategies to mitigate anticipated potential challenges; this involved guiding mentees in what to expect or learning to predict future situations and then plan ahead. Mentors often sought potential strategies via online resources in efforts to support their mentee. One mentee shared the strategies for test-taking anxiety that was suggested, "My mentor gave me…progressive muscle relaxation... she gave me just like a bunch of tips on relaxation, de-stressing, deep breathing, holistic ideas. She like printed it out and brought it for me" (U32)

Theme 4: Supporting Mentees by Setting Limits

This theme refers to the boundaries that mentors needed to recognize and maintain in helping mentees overcome disability-related challenges and maintain a productive mentorship relationship. Mentees often had LD/ADHD-related difficulties (e.g., executive functioning) in managing their schedules and in following through with scheduled mentorship meetings. Mentors also faced limitations in support they could provide, such as when mentees needed services like tutoring or psychological counseling.

Accountability

Mentors supported mentees' commitment to the mentorship relationship through expectations of follow-through by mentees and setting limits regarding their meeting availability. Disability-related challenges to memory, managing time and schedules, and communication often initially left mentors frustrated by mentees not showing up and/or not canceling scheduled mentorship meetings. However, once mentors understood the nature of LD/ADHD symptoms and impacts on mentees' time management, initiation, and follow-through, mentors were better able to support mentees in being able to keep scheduled mentorship meetings. Once understood, mentors typically assumed the role of initiator, which initially required the mentor to be the one to schedule meeting times and send reminders. However, mentors also used their understanding of LD/ADHD symptoms to support mentees by providing scaffolded support for managing appointments and communications. This scaffolded approach allowed mentors to gradually shift the responsibility of scheduling meetings to the mentees; some did this by taking turns with mentees in assuming the scheduling tasks, others used routine meeting times and days, which allowed for gradually fewer reminders.

One mentee reported that the difficulty experienced in meeting the mentorship scheduling demands was related to LD/ADHD-related time-management challenges, as follows:

> I think it [LD/ADHD] probably affects my relationship with my mentor right now because I keep showing up late to appointments or missing them and I have to reschedule and I'm sure she doesn't like it. I think it's probably related and I'm not good at keeping track of my schedule. I haven't mastered the to-do list thing yet, so that's my problem. (U33)

Mentors also expected follow-through by mentees in trying out the strategies discussed within the mentorship meetings, such as strategies for managing academics, professional development (e.g., participation in professional clubs), and social situations (e.g., roommate situations). Mentors shared that it

was also often necessary to remind mentees to follow through with any goals that were established during the mentor/mentee meetings. One mentor explained this need as follows:

> So we've just been doing, we've set long term goals, and we've set short term goals for every like two weeks. So we come back every two weeks and revisit them and see how they went and stuff like that… throughout the week she calls and texts whenever she has questions or issues. It's been good. (M99)

Linking to Other Resources

Mentors needed to recognize and understand the limits of what they could provide mentorship for. Some mentors also had to understand and accept when they just had to let their mentees learn to use other supports, that they couldn't just do things for their mentee. Mentors shared how mentees were often challenged by talking to instructors about classroom accommodations; these mentees were oftentimes better served by learning to work with their campus disability office advisor.

Beyond disability accommodations, several mentors experienced situations in which they felt that their mentee required a type or level of support that was beyond their expertise or beyond the intended mentor role; as such, they needed to refer to appropriate resources. As one mentor expressed, "I can't give her financial advice or do anything like that so it's hard for them" (MM6). However, sometimes, especially when mentees had grown to rely on their mentor for support across multiple areas of the mentee's life, mentees could become disappointed that they needed to work with another person, such as a tutor or counselor. Mentors shared that disappointment might be linked to the prospect of needing to garner support from someone who may or may not understand about their LD/ADHD challenges, thus potentially requiring the mentee to explain to another person about the LD/ADHD. Mentors reported times where they needed to refer their mentee to the disability resource center, writing center, or campus wellness center so that their mentee could find the appropriate support, as follows:

> Right now her [my mentee's] academic life is dictating her social life, so I kind of told her to go to GatorWell [the campus-based health promotion center] and have her work with them to try and figure out a schedule, to work on stuff. For her, making it [the focus of what she works on] sleeping because she's kind of become nocturnal…She's gotten really good feedback from them about creating a study schedule, figuring out when to do things, how to get a proper sleeping schedule, proper diet, and all that kind of stuff. So now she's kind of evolving better socially because she's organized her academics and stuff. (MM9)

Discussion

Overall, this study elucidates actions and processes used by graduate-student mentors in supporting undergraduate mentees' abilities to regulate emotions, thinking, and actions toward overcoming challenges and persisting towards goals. This study identified key roles and actions that mentors undertook as part of their mentorship process in supporting mentees' regulation of emotions, thinking, and behaviors as undergraduate students with LD/ADHD. Findings show processes and contexts by which graduate student mentors acted as co-regulators in supporting their undergraduate mentees academic and personal growth. Results indicate that mentorship, as provided by mentors who are supported in developing their understanding of LD/ADHD by campus personnel who are LD/ADHD knowledgeable, can be leveraged for supporting the co-regulation needs of college students with LD/ADHD in meeting current and anticipated expectations for productive living within the college context.

Critical elements of building a supportive and responsive mentoring relationship for the undergraduates with LD/ADHD were providing emotional support, building trust, and creating a safe space to share about disability-related challenges within the relationship. This served as the foundation for establishing an environment where co-regulation of mentees' emotions and behaviors could occur organically. Notably, providing emotional support was the role that was most consistently discussed during mentor cohort meetings. This finding is consistent with literature about students with LD/ADHD that identifies supportive relationships with mentors as important for managing emotional aspects of college experiences (Mytkowicz & Goss, 2012). Mentors, through the intentional provision of emotional support and the fostering of trusting relationships, can provide encouragement that prompts the mentee's use of emotional and behavioral self-regulation, such as use of adaptive coping strategies during stressful situations, that can help students with LD/ADHD persist towards their goals.

Having a mentor who had undergone a similar college and career trajectory was important for supporting mentees' understanding of academics and

planned career. The mentors provided co-regulation of cognitions (i.e., thinking) around planning. Mentors' role modeling and sharing of personal experiences assisted mentees in envisioning and implementing pathways that best fit their personal needs within their college trajectory. Interestingly, the role of advising was discussed more often than professional direction and was the second most discussed role. This focus may be due to the range of topics addressed under the advising role, which included personal, academic, social, career, and health and wellness topics. This finding is consistent with holistic peer-mentoring practices where peers serve as the mentors and respond to a range of needs, including the peer mentees' psychosocial and academic needs (Ward et al., 2014).

Having mentors who were seen by the mentee as being successful in traversing a similar path was an important component for helping mentees envision their own ability to succeed. This finding is consistent with those of Rittmayer and Beier (2009) whereby access to others who can serve as role models or who can provide feedback bolsters self-efficacy for college students in STEM (Rittmayer & Beier, 2009). Self-efficacy refers to an individual's belief that one can persist towards goals and engage in the actions necessary to achieve the goals (Bandura, 1991). Self-efficacy with regards to beliefs about being able to persist in college is especially cogent for students with LD/ADHD in STEM. Disability-related executive functioning difficulties, such as working memory, can be particularly challenged by the types of information processing demands inherent in STEM (Brigham et al., 2011). For the mentees, having a mentor that had undergone a similar STEM path, while also having a level of understanding about LD/ADHD, was important for offering holistic guidance that also served to provide co-regulation for mentees' decision making when taking steps to reach both personal and STEM-related goals.

Mentors played a role in supporting mentees' strategy generation through co-creating strategies and, at times, suggesting strategies. Additionally, mentors assisted mentees in coping with decision-making, goal setting, and problem-solving. Mentors' actions are consistent with the tenets of co-regulation whereby the co-regulator builds self-regulation abilities by intentionally scaffolding or prompting skill and/or strategy acquisition while providing a safe environment for growth (Murray & Rosanbalm, 2017). These actions also have parallel components within positive youth development initiatives (Small & Memmo, 2004) whereby goals include seeking to optimize the young persons' trajectory across the lifespan (Lerner et al., 2011). Strengthened by parallels with key components of positive youth development models, disability-informed mentorship may be helpful in fostering young peoples' self-regulation abilities in preparation for what lies ahead as an emerging adult within a college environment.

We found that mentors needed to be prepared to face LD/ADHD symptom-related challenges within the mentoring relationship- challenges such as memory, executive attention, and/or organization challenges that manifest as the mentee not following through on agreed upon actions. However, mentors needed support in understanding that such challenges may be related to or exacerbated by LD/ADHD symptom manifestations in the mentee's everyday lives (e.g., time management difficulties). We found that mentors had to be persistent in reaching out to their mentees, and that such persistence often required mentors' understanding of LD/ADHD symptom manifestations. Some mentors also needed to be prepared for instances when the mentee needed support that went beyond the role of the mentor, such as when to refer their mentee to the campus counseling center or the campus disability support office. Overall, mentees with LD/ADHD required increased behavioral co-regulation of time management and accountability to participate regularly in the mentoring experience. This type of support is counter to conventional college mentoring practices whereby reciprocal accountability is what is typically expected in mentorship of college students and trainees (Straus et al., 2013). As such, mentors who provide support to undergraduate mentees with LD/ADHD should be prepared for symptom manifestations that may potentially challenge the healthy development of the mentoring relationship.

On college campuses, graduate students serve multiple roles, such as teaching assistants and graduate research assistants, where they will interact with other undergraduate students. When interacting with multiple students, graduate assistants working in any sort of teaching capacity will likely encounter among the students a wide range of thinking and learning styles (Horowitz et al., 2017; Nisbett et al., 2001). It is here that understanding about LD/ADHD and strategies used by, and in support of, students with LD/ADHD can be helpful and applied within other student relationships. These LD/ADHD understandings and strategies are important for providing vital co-regulation support for college-age students with a range of thinking and learning styles.

Notably, relatively few co-regulation studies are specific to young adults. Most studies focus on younger populations and how parents or caregivers serve as co-regulators (Murray & Rosanbalm, 2017). Additional studies of co-regulation in young adult

contexts such as college and early career are needed to better understand the roles of supportive others beyond family members and impacts on adult trajectories. Specifically, greater understanding is needed of the role of supportive others within the breadth of emerging adulthood's contexts including engagement in daily life tasks, managing personal health and wellness, early career, and social relational interactions.

Practical Considerations

With one in five students experiencing neurocognitive challenges to reading, writing, math, and/or attention (Horowitz et al., 2017), college campuses have a potentially enormous segment of their student body that may benefit from interpersonal relationships offering co-regulation in support of the student's self-regulation toward meeting goals and developing independence and resilience. In recent years, there has been an increase in the number of students with LD/ADHD in higher education, which has placed higher demands for service delivery within college campuses (DuPaul et al., 2009; Madaus, 2011). It can be difficult for students with disabilities to access needed accommodations on college campuses due to the prevalence of understaffing within campus disability service offices and resultant limited availability for student appointments (Toutain, 2019; Wenc, 2021). Limitations in campus disability office resources can also limit the disability office's ability to engage in outreach throughout campus, which is a barrier to creating disability-support programs for, and/or in conjunction with, academic stakeholders. Since both disability offices and academic offices have limited resources to handle such a potentially large population, disability-informed graduate student mentorship can possibly contribute to the campus' human-resource pool of individuals who are equipped to support undergraduates with LD/ADHD.

While the purpose of this study was to examine the roles and processes in which disability-informed mentors provided co-regulation support for their mentees with LD/ADHD, it should be acknowledged that such a disability-informed mentorship model required partnerships amongst academic and disability-focused personnel. Details of the parent study, including specifics and outcomes of the mentorship model are described elsewhere (Kreider et al., 2018, 2021).

Within the larger study, the on-going periodic support of the mentors in their development of understanding of their mentee's specific LD/ADHD symptom manifestations, impacts, and experiences was a critical aspect of the mentorship model. Potential limitations of the graduate student mentor model used in the parent study include the following: (a) the research team, comprised of faculty with disability and STEM expertise provided the on-going mentor support and managed the mentorship program, (b) mentors and mentees were compensated for their participation, and (c) the mentorship occurred for undergraduates within STEM fields. These limitations challenge generalization of study findings to populations outside of STEM fields of study, as well as generalization of the mentorship model to other campuses. However, that some participants were willing to participate in the parent study without compensation provides indication of the potential feasibility of the graduate student mentor model in engaging graduate students to act as mentors. While overarching recommendations may be gleaned from the mentorship model used, additional studies are needed to test for key ingredients of mentorship for undergraduates with LD/ADHD and tested across a variety of campus types.

With knowledge and expertise in LD/ADHD, the campus disability office has the potential to be the go-to place for LD/ADHD knowledge needed to inform mentors of students with LD/ADHD. Campus disability offices can partner with campus teaching resource centers and teaching assistant training programs to offer trainings and workshops to provide faculty and graduate students with knowledge and skills in working with undergraduate students having LD/ADHD. Meanwhile, the academic office personnel at the department or college level can coordinate trainings specific to mentorship skill development and can support the recruitment of graduate mentors; academic personnel can lead or co-lead the mentor support groups with support from, or in coordination with, the campus disability office and/or the campus teaching resource center.

Such a comprehensive support network, while ideal, leverages the strength of each unit to foster co-regulation supports of undergraduate students in need of LD/ADHD support. While such a model may live in the ideal, some campuses, based on the educational programs offered, may have additional resources for working toward such a model. A campus disability office could partner with educational programs such as occupational therapy and special education, to develop a range of potential supports. For example, at state universities in Florida, occupational therapy students are partnering with campus disability offices as part of students' fieldwork experiences and/or capstone projects whereby the students are working with the disability office to assist with creating and implementing needed supports for bolstering students' occupational performance and wellbeing.

Overall, we found that mentorship of students with LD/ADHD is benefitted by mentors' understand-

ing of the LD/ADHD conditions, impacts, and mentees' contextualized experiences. This finding, while observed within formal mentorship relationships, is not underpinned by any aspect of formal versus informal mentorship arrangements and is thus, likely also applicable to informal relationships. Campus investments in increasing individuals' understanding of the high-incidence LD/ADHD conditions is a low-stakes investment whose gains have the potential to ripple out and benefit students with a wide range of thinking and learning styles.

Conclusion

This study extends understanding specific to the process of co-regulation used within a campus-based mentorship for young adults with LD/ADHD in supporting abilities to meet demands associated with academic progression and emerging adult roles and new adult contexts. Findings evidence the importance of how providing holistic mentorship can support the self-regulation needs of students with LD/ADHD. Study findings are important for informing development of ecological interventions supporting transition to adult roles and contexts for individuals with disabilities.

Mentors are common social supports on college campuses that can be leveraged to intentionally serve as co-regulators in supporting mentees' academic, professional, and personal development, and disability-informed mentorship can support both academic and personal (i.e., social, daily, health and wellness) development of mentees with LD/ADHD. In their roles as co-regulators, disability-informed mentors are positioned to foster their mentees' resilience in the transition to adulthood through college pathways.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5.*

Ames, M. E., McMorris, C. A., Alli, L. N., & Bebko, J. M. (2016). Overview and evaluation of a mentorship program for university students with ASD. *Focus on Autism and Other Developmental Disabilities, 31*(1), 27-36. https://doi.org/10.1177/1088357615583465

Arnett, J. J. (2006). Emerging adulthood: Understanding the new way of coming of age. In *Emerging adults in America: Coming of age in the 21st century.* (pp. 3–19). American Psychological Association. https://doi.org/10.1037/11381-001

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50(2),* 248–287. https://doi.org/10.1016/0749-5978(91)90022-L

Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. P*sychological Bulletin, 121*(1), 65–94. https://doi.org/10.1037/0033-2909.121.1.65

Bettencourt, G. M., Kimball, E., & Wells, R. S. (2018). Disability in postsecondary STEM learning environments: What faculty focus groups reveal about definitions and obstacles to effective support. *Journal of Postsecondary Education & Disability, 31*(4), 383–396.

Brigham, F. J., Scruggs, T. E., & Mastropieri, M. A. (2011). Science education and students with learning disabilities. *Learning Disabilities Research & Practice, 26*(4), 223–232. https://doi.org/10.1111/j.1540-5826.2011.00343.x

Brown, S. E., Takahashi, K., & Roberts, K. D. (2010). Mentoring individuals with disabilities in postsecondary education: A review of the literature. *Journal of Postsecondary Education and Disability, 23*(2), 98–111.

Butler, D. L. (1998). The strategic content learning approach to promoting self-regulated learning: A report of three studies. *Journal of Educational Psychology, 90,* 682–697. https://doi.org/10.1037/0022-0663.90.4.682

Charmaz, K. (2014). *Constructing grounded theory.* Sage.

Coles, A. (2011). *The role of mentoring in college access and success.* Research to practice brief. https://eric.ed.gov/?id=ED520415

Cortiella, C., & Horowitz, S. H. (2014). The state of learning disabilities: Facts, trends and emerging issues. New York: National Center for Learning Disabilities. https://www.ncld.org/wp-content/uploads/2014/11/2014-State-of-LD.pdf

Creswell, J. W. (1998). *Qualitative inquiry and research design choosing among five traditions.* Sage.

Duerksen, K., Besney, R., Ames, M., & McMorris, C. A. (2021). Supporting autistic adults in postsecondary settings: A systematic review of peer mentorship programs. *Autism in Adulthood, 3*(1), 85–99. https://doi.org/10.1089/aut.2020.0054

DuPaul, G. J., Gormley, M. J., & Laracy, S. D. (2013). Comorbidity of LD and ADHD: Implications of DSM-5 for assessment and treatment. *Journal of Learning Disabilities, 46*(1), 43–51. https://doi.org/10.1177/0022219412464351

DuPaul, G. J., Pinho, T. D., Pollack, B. L., Gormley, M. J., & Laracy, S. D. (2017). First-year college students with ADHD and/or LD: Differences in engagement, positive core self-evaluation, school preparation, and college expectations. *Journal of Learning Disabilities, 50*(3), 238–251. https://doi.org/10.1177/0022219415617164

DuPaul, G. J., Weyandt, L. L., O'Dell, S. M., & Varejao, M. (2009). College students with ADHD: Current status and future directions. *Journal of Attention Disorders, 13*(3), 234–250. https://doi.org/10.1177/1087054709340650

Friedensen, R., Lauterbach, A., Kimball, E., & Mwangi, C. G. (2021). Students with high-incidence disabilities in STEM: Barriers encountered in postsecondary learning environments. *Journal of Postsecondary Education & Disability, 34*(1), 77–90.

Gerber, P. J. (2012). The impact of learning disabilities on adulthood. *Journal of Learning Disabilities, 45*(1), 31–46. https://doi.org/10.1177/0022219411426858

Grandy, G. (2010). Instrumental case study. In A. Mills, G. Durepos, & E. Wiebe (Eds.), *Encyclopedia of case study research* (Vol. 1, pp. 473–475). Sage. https://doi.org/https://dx.doi.org/10.4135/9781412957397.n175

Hechtman, L., Swanson, J. M., Sibley, M. H., Stehli, A., Owens, E. B., Mitchell, J. T., Arnold, L. E., Molina, B. S. G., Hinshaw, S. P., Jensen, P. S., Abikoff, H. B., Perez Algorta, G., Howard, A. L., Hoza, B., Etcovitch, J., Houssais, S., Lakes, K. D., Nichols, J. Q., Vitiello, B… (2016). Functional adult outcomes 16 years after childhood diagnosis of attention-deficit/hyperactivity disorder: MTA results. *Journal of the American Academy of Child & Adolescent Psychiatry, 55*(11), 945–952. e942. https://doi.org/10.1016/j.jaac.2016.07.774

Hofmann, W., Schmeichel, B. J., & Baddeley, A. D. (2012). Executive functions and self-regulation. *Trends in cognitive sciences, 16*(3), 174–180. https://doi.org/10.1016/j.tics.2012.01.006

Horowitz, S., Rawe, J., & Whittaker, M. (2017). *The state of learning disabilities: Understanding the 1 in 5: Executive summary.* New York: National Center for Learning Disabilities. https://www.ncld.org/wp-content/uploads/2017/03/Executive-Summary.Fin_.03142017.pdf

Kreider, C. M., Bendixen, R. M., & Lutz, B. J. (2015). Holistic needs of university students with invisible disabilities: A qualitative study. *Physical & Occupational Therapy in Pediatrics, 35*(4), 426–441. https://doi.org/10.3109/01942638.2015.1020407

Kreider, C. M., Medina, S., Lan, M. F., Wu, C. Y., Percival, S. S., Byrd, C. E., ... & Mann, W. C. (2018). Beyond academics: A model for simultaneously advancing campus-based supports for learning disabilities, STEM students' skills for self-regulation, and mentors' knowledge for co-regulating and guiding. *Frontiers in Psychology, 9*, 1466. https://doi.org/10.3389/fpsyg.2018.01466

Kreider, C. M., Medina, S., & Koedam, H. M. (2021). (Dis) ability-informed mentors support occupational performance for college students with learning disabilities and attention-deficit/hyperactivity disorders through problem-solving and a focus on strengths. *British Journal of Occupational Therapy, 84*(5), 263-270. https://doi.org/10.1177/0308022620937636

Kuriyan, A. B., Pelham, W. E., Molina, B. S. G., Waschbusch, D. A., Gnagy, E. M., Sibley, M. H., Babinski, D. E., Walther, C., Cheong, J., Yu, J., & Kent, K. M. (2013). Young adult educational and vocational outcomes of children diagnosed with ADHD. *Journal of Abnormal Child Psychology, 41*(1), 27–41. https://doi.org/10.1007/s10802-012-9658-z

Lagacé-Leblanc, J., Massé, L., & Rousseau, N. (2022). Academic impairments faced by college students with attention-deficit hyperactivity disorder: A qualitative study. *Journal of Postsecondary Education & Disability, 35*(2), 131–144.

Lerner, R. M., Lerner, J. V., Lewin-Bizan, S., Bowers, E. P., Boyd, M. J., Mueller, M. K., Schmid, K. L., & Napolitano, C. M. (2011). Positive youth development: Processes, programs, and problematics. *Journal of Youth Development, 6*(3), 38–62. https://doi.org/10.5195/jyd.2011.174

Madaus, J. W. (2011). The history of disability services in higher education. *New Directions for Higher Education, 2011*(154), 5-15. https://doi.org/10.1002/he.429

Major, A., Martinussen, R., & Wiener, J. (2013). Self-efficacy for self-regulated learning in adolescents with and without attention deficit hyperactivity disorder (ADHD). *Learning and Individual Differences, 27*, 149–156. https://doi.org/https://doi.org/10.1016/j.lindif.2013.06.009

Masten, A. S. (2009). Ordinary magic: Lessons from research on resilience in human development. *Education Canada, 49*(3), 28–32. https://eric.ed.gov/?id=EJ868694

McGregor, K. K., Langenfeld, N., Van Horne, S., Oleson, J., Anson, M., & Jacobson, W. (2016). The university experiences of students with learning disabilities. *Learning Disabilities Research & Practice, 31*(2), 90–102. https://doi.org/10.1111/ldrp.12102

Murray, D. W., & Rosanbalm, K. (2017). *Promoting self-regulation in adolescents and young adults: A practice brief*. (OPRE Report #2015-82). https://eric.ed.gov/?id=ED594226

Murray, D. W., Rosanbalm, K., Christopoulos, C., & Hamoudi, A. (2015). *Self-regulation and toxic stress report 1: Foundations for understanding self-regulation from an applied perspective.* U.S. Department of Health & Human Services: Office of Planning, Research, & Evaluation

Mytkowicz, P., & Goss, D. (2012). Students' perceptions of a postsecondary LD/ADHD support program. *Journal of Postsecondary Education and Disability, 25*(4), 345–361. https://eric.ed.gov/?id=EJ1002145

National Academies of Sciences, Engineering, and Medicine. (2019). The Science of Effective Mentorship in STEMM. Washington, DC: *The National Academies Press.* https://doi.org/10.17226/25568.

Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review, 108*, 291–310. https://doi.org/10.1037/0033-295X.108.2.291

Ommundsen, Y., Haugen, R., & Lund, T. (2005). Academic self-concept, implicit theories of ability, and self-regulation strategies. *Scandinavian Journal of Educational Research, 49*(5), 461–474. https://doi.org/10.1080/00313830500267838

QSR International Pty Ltd. (2018). NVivo (Version 12). https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

Rando, H., Huber, M. J., & Oswald, G. R. (2016). An academic coaching model intervention for college students on the autism spectrum. *Journal of Postsecondary Education & Disability, 29*(3), 257–262.

Riggs, R. J. (2022). *Perceptions of tenured science faculty regarding the provision of reasonable accommodations for students with disabilities*. Electronic Theses and Dissertations. https://doi.org/ https://dc.etsu.edu/etd/4094

Rittmayer, A. D., & Beier, M. E. (2009). Overview: Self-efficacy in STEM. In B. Bogue & E. Cady (Eds.), *Applying research to practice (ARP) resources*. Retrieved November 19, 2021 from http://aweonline.org/selfefficacy_002.html

Saldaña, P. (2013). *The coding manual for qualitative researchers* (2nd ed.). SAGE.

Schunk, D. H., & Dibenedetto, M. K. (2022). Self-regulation, self-efficacy, and learning Disabilities. *Learning Disabilities-Neurobiology, Assessment, Clinical Features and Treatments* (pp.37-49). Intechopen. https://doi.org/10.5772/intechopen.99570

Small, S., & Memmo, M. (2004). Contemporary models of youth development and problem prevention: Toward an integration of terms, concepts, and models. *Family Relations 53*(1), 3–11. https://doi.org/10.1111/j.1741-3729.2004.00002.x

Straus, S. E., Johnson, M. O., Marquez, C., & Feldman, M. D. (2013). Characteristics of successful and failed mentoring relationships: a qualitative study across two academic health centers. *Academic Medicine, 88*(1), 82–89. https://doi.org/10.1097/ACM.0b013e31827647a0

Toutain, C. (2019). barriers to accommodations for students with disabilities in higher education: a literature review. *Journal of Postsecondary Education and Disability, 32*(3), 297–310.

Vaismoradi, M., Jones, J., Turunen, H., & Snelgrove, S. (2016). Theme development in qualitative content analysis and thematic analysis. *Journal of Nursing Education and Practice, 6*(5). https://doi.org/10.5430/jnep.v6n5p100

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing & Health Sciences, 15*(3), 398–405. https://doi.org/10.1111/nhs.12048

Varvara, P., Varuzza, C., Sorrentino, A. C. P., Vicari, S., & Menghini, D. (2014). Executive functions in developmental dyslexia. *Frontiers in Human Neuroscience, 8*. https://doi.org/10.3389/fnhum.2014.00120

Ward, E. G., Thomas, E. E., & Disch, W. B. (2014). Mentor service themes emergent in a holistic, undergraduate peer-mentoring experience. *Journal of College Student Development, 55*(6), 563–579. https://doi.org/10.1353/csd.2014.0058

Wenc, T.-J. (2021). *Challenges, practices, and preferences of postsecondary accessibility service providers in Alberta when implementing accommodations for invisible disabilities* (Publication Number 28319829) [D.Psy., Walden University]. ProQuest Dissertations & Theses Global. Ann Arbor. https://scholarworks.waldenu.edu/dissertations/10281

Wolf, L. E. (2006). College students with ADHD and other hidden disabilities. *Annals of the New York Academy of Sciences, 931*(1), 385–395. https://doi.org/10.1111/j.1749-6632.2001.tb05792.x

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