Assessing and Overcoming the Functional Impact of ADHD in College Students: Evidence-Based Disability Determination and Accommodation Decision-Making

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Abstract

Information about academic, social, and occupational functioning is essential to accommodation decision-making, planning, and monitoring. However, many clinicians who assess college students for ADHD focus chiefly on symptom number or severity rather than on the barriers experienced by students in their everyday life activities. The psychological reports and supporting documentation submitted by clinicians to a college disability office were examined for evidence of functional limitations. All students described in the reports were diagnosed with ADHD and were receiving accommodations for that condition. Only 32% of clinicians provided any description of current limitations and only 42% provided any evidence of previous limitations or history of accommodations. Evidence came largely from student self-reports rather than from the reports of others, medical documentation, or educational records. These findings indicate that the data clinicians provide may be less useful to disability professionals who must select, implement, and monitor the effects of accommodations in an evidence-based manner. Several practical recommendations are offered to clinicians and disability professionals, such as the use of adaptive functioning rating scales, which can facilitate the assessment of functional limitations and the provision of effective accommodations to students with ADHD.

Keywords: accommodations, adaptive functioning rating scales, ADHD, assessment, college students

Attention-deficit/hyperactivity disorder (ADHD) is characterized by significant symptoms of inattention and/or hyperactivity-impulsivity that emerge in childhood, appear in multiple settings, and limit functioning (American Psychiatric Association, 2013). Approximately 5% of postsecondary students have ADHD and experience academic and/or social-emotional problems because of this condition (Ramsay & Rostain, 2015). Prospective, longitudinal data indicate that high school students with ADHD complete fewer academic courses, earn lower grades, and are more likely to be referred for special tutoring or remedial classes than their classmates without ADHD (Newman et al., 2011). If they attend college, students with ADHD disproportionately enroll in two-year public (i.e., community) colleges rather than in four-year colleges or universities (Newman et al., 2012). They report more problems with time management, study skills, and test-taking than their classmates and are less likely to earn high grades or complete their degrees than students without ADHD (Gormley, DuPaul, Weyandt, & Anastopoulos, 2016; Ofiesh, Moniz, & Bisagno, 2015;). Postsecondary students with ADHD also report more problems with anxiety, mood, and academic self-efficacy than their peers (Barkley, 2015a; DuPaul, Pinho, Pollack, Gormley, & Laracy, 2017; Nelson & Gregg, 2012).

Recent federal regulations identify ADHD as a potentially disabling condition that can merit accommodations in college (U.S. Department of Justice, 2016). The purpose of academic accommodations is to remove barriers for students with disabilities so they can learn, and demonstrate their learning, in a manner similar to their peers without disabilities (Gregg, Coleman, Lindstrom, & Lee, 2007; Gregg & Lindstrom, 2008). For example, a student with ADHD might require lectures to be audio recorded due to classroom design issues that create barriers to

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attention and concentration during class. Another student with ADHD might require tests to be administered in a separate room to reduce distractions in the classroom setting that might interfere with exam performance. Accommodations like these are designed to increase students' access to learning experiences, remove construct-irrelevant variance from exam scores, and safeguard students' participation in higher education (Gregg, 2009a, 2011).

Functional Impact

Determining the impact of students' inattentive and/or hyperactive-impulsive symptoms on their day-to-day functioning is central to the psychiatric conceptualization of ADHD and the legal definition of a disability (Joyce-Beaulieu & Sulkowski, 2016; Oliver, 2017). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) requires individuals with ADHD to show "clear evidence that symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning" (American Psychiatric Association, 2013, p. 60). Its authors provide examples of functional limitations experienced by adults with ADHD including low academic achievement and attainment, poor work performance or unemployment, and interpersonal problems such as conflict with parents or rejection by peers. Assessment of these functional limitations is critical to the ADHD diagnosis; their presence indicates the need for accommodations that allow students full participation in academic, social, and occupational activities (Roberts, Milich, & Barkley, 2015).

Similarly, the Americans with Disabilities Act Amendments Act (ADAAA) classifies ADHD as a disability "if it substantially limits the ability of an individual to perform a major life activity compared to most people in the general population" (U,S. Department of Justice, 2016, p. 53224). The ADAAA cautions, "not every diagnosis constitutes a disability;" an individual must also experience substantial limitations based on an "individualized assessment of functioning" (U.S. Department of Justice, 2016, p. 53224). Indeed, the provision of accommodations to students with disabilities is based on the degree the condition impacts the individual's activities, not the ADHD diagnosis itself; without functional limitations, accommodations are not necessary (Gregg, 2009b).

Although symptom severity and overall functioning may seem synonymous, empirical studies show them to be distinct constructs that are only moderately correlated (Gray, Fettes, Woltering, Mawjee, & Tannock, 2016; Lovett, Gordon, & Lewandowski, 2016). Studies investigating the association between symptom severity and academic, social, or occupational limitations in adults with ADHD have yielded median bivariate correlations ranging from .25 for individual items to .70 for composite measures. These findings indicate that symptom severity explains less than one-half of the variance of the functioning of adults with this condition (Lewandowski, Lovett, & Gordon, 2016). Disability professionals may be especially cognizant of discrepancies between symptom severity and academic functioning in college students with ADHD. Some students experience significant ADHD symptoms, but use compensatory strategies to function effectively at school (Manos, 2010). Other students with ADHD encounter barriers in certain classes, but not others, depending on the demands these classes place on attention, concentration, and inhibition. Still other students fall short of the number of symptoms required for an ADHD diagnosis, but experience substantial limitations in their academic functioning, nonetheless (D'Alessio & Banerjee, 2016; Ofiesh et al., 2015). The assessment of these limitations, independent of symptom count or severity, is therefore essential to the conceptualization of ADHD as a psychiatric disorder and as a disability (Gathje, Lewandowski, & Gordon 2008).

A thorough assessment and description of students' functioning is also needed for practical accommodation decision-making. Lindstrom, Nelson, and Foels (2015) examined the documentation required by most colleges for students seeking accommodations for ADHD. Nearly all colleges required a current ADHD diagnosis assigned by a qualified professional and evidence of functional limitations that would require academic accommodations. Similarly, Banerjee, Madaus, and Gelbar (2015) surveyed college disability professionals about their accommodation decision-making. Disability professionals typically reviewed students' documentation for evidence of current academic problems (e.g., low grades, difficulty completing degree requirements) or a history of limitations (e.g., educational or medical records showing academic or behavior problems, a need for previous accommodations, or prescriptions for medication). Indeed, disability professionals regarded evidence of current or previous limitations as more important than the student's diagnosis when making accommodation decisions.

Professional guidelines also emphasize functional impact, rather than diagnostic labels, when making accommodation decisions for college students. The Association on Higher Education and Disability (AHEAD) guidance document reads, "Each situation must be considered individually to understand if and how the student is impacted by the described condition. The salient question is not whether a given condition is a 'disability,' but how the condition impacts

the student" (AHEAD, 2012, p. 3). When third-party documentation is needed to make accommodation decisions, "the requested information should clarify the connection between the condition and the environmental barrier for which accommodations are requested" (Standing Committee on Professional Development, 2016, p. 2). Psychological evaluations and other third-party documentation that lacks information about ADHD-related barriers may be of limited usefulness in making accommodation decisions.

Finally, baseline information about students' functioning can be used to evaluate the effectiveness of accommodations and other services provided by disability professionals. Although academic accommodations are frequently provided to students with ADHD, there is surprisingly little research demonstrating their effectiveness. For example, studies investigating the effects of additional time on students' exam performance have been limited, and have yielded mixed results (Gregg & Nelson, 2012; Wadley & Liljequist, 2013). Furthermore, researchers have only recently begun to examine the effects of other accommodations, such as testing in a separate room, the provision of additional rest breaks, or access to notes or recorded lectures on the academic functioning of postsecondary students (see Lovett & Lewandowski, 2015). A thorough description of students' functioning in academic, social, and/or occupational domains, before and after the implementation of accommodations, can be used to determine their effectiveness over time.

Only recently have researchers examined the degree to which clinicians assess limitations when assessing college students with ADHD. Nelson, Whipple, Lindstrom, and Foels (2014) reviewed the psychological evaluations of 100 university students seeking academic accommodations for ADHD. Although all clinicians assigned an ADHD diagnosis, only 59% provided any information about students' limitations in academic, social, or occupational functioning. The results are limited in three respects, however. First, the study involved students seeking academic accommodations, rather than students already receiving accommodations because of a documented disability. Second, the researchers examined only students' psychological evaluations; other documentation that could indicate current or previous limitations (e.g., academic or medical records) was not reviewed. Third, the reviewers accepted any description of functional limitations, even if these limitations were not specific to ADHD. Despite these limitations, initial evidence suggests that some clinicians focus on symptom number and severity and overlook the barriers that students experience in real-world contexts.

The Current Study

Information about students' functioning is essential to accommodation decision-making, planning, and monitoring. Unfortunately, the psychological reports and other documentation submitted to college disability offices may lack information about the impact of ADHD symptoms on students' learning, social interactions, or work performance. A thorough description of students' functioning across domains would facilitate the provision of accommodations targeted to students' specific needs. In contrast, documentation that provides an ADHD diagnosis, without information about students' functioning across settings, may be less helpful to disability professionals as they attempt to remove barriers to students' participation in postsecondary education.

Information provided by multiple informants (e.g., students, teachers, peers), using multiple methods (e.g., interviews, observations, rating scales) is especially important when assessing ADHD and determining the need for accommodations (Ramsay, 2015). Although a diagnostic interview with the student remains the cornerstone of adult ADHD assessment, self-report data must be corroborated by information from other sources using other methods. Previous research has shown that young adults' recall of their ADHD symptoms in childhood is often inaccurate (Miller, Newcorn, & Halperin, 2010; Sibley, Pelham, Molina, Gnagy, Waschbusch et al., 2012). For example, Mannuzza, Klein, Klein, Bessler and Shrout (2002) found that only 78% of adults with well-documented histories of ADHD in childhood reported a history of significant symptoms, whereas 11% of adults without histories of ADHD recalled significant symptoms in childhood. Similarly, Dias and colleagues (2008) showed that only two-third of adults who reported a childhood history of ADHD had parents who corroborated their reports.

Previous research has also shown inaccuracies in young adults' reports of current ADHD symptoms and academic limitations (Sibley, Pelham, Molina, Gnagy, Waxmonsky, et al., 2012). For example, Lewandoswki, Lovett, Codding, and Gordon (2008) found that most college students without ADHD reported significant problems with distractibility and fidgetiness, and one-third of college students without ADHD also reported significant problems with inattention and feelings of restlessness. Similarly, Lewandowski, Cohen, and Lovett (2013) found that although students with ADHD report more problems with reading accuracy, comprehension, and speed than their classmates without ADHD, their actual reading performance does not differ. For these reasons, DSM-5 instructs clinicians to rely on ancillary

information, such as educational or medical records, to establish ADHD symptom onset prior to age 12 years (Criterion B; American Psychiatric Association, 2013) and to gather information from multiple informants, such as parents or teachers, to establish the presence of symptoms across multiple settings (Criterion C; American Psychiatric Association, 2013). Indeed, multimethod/multiinformant assessment is considered best practice in the assessment of ADHD in adults (Adler, Shaw, Kovacs, & Alperin, 2015; Ramsay, 2015).

The purpose of our study was to determine whether clinicians who conduct ADHD evaluations provide evidence of functional impact in the documentation they submit to college disability offices. To accomplish this task, we looked for information about ADHD-related limitations in the psychological reports and supporting documentation submitted by a large sample of college students with ADHD. All students were assigned the primary diagnosis of ADHD and were receiving academic accommodations because of that condition. We expected that most reports and supporting documentation would provide clear evidence of limitations in students' functioning, which could be used to plan effective interventions. However, if we discovered a lack of information in the documentation, we examined whether our findings might point to specific strategies that clinicians and college disability professionals might use to gather better data regarding students' functioning and facilitate evidence-based accommodation granting.

Method

Participants

Participants were 146 undergraduates (52.7% men) attending a residential, liberal arts college in the Midwest. Ages ranged from 17.5 to 21.2 years (M = 18.61, SD = .55). Ethnicities included White (89.0%), African American (4.8%), Latino (2.1%), Asian American (1.4%), and other (2.8%). All participants had a primary diagnosis of ADHD and were receiving academic accommodations for limitations associated with that condition. Specific diagnoses were ADHD, Inattentive Type/Presentation (42.5%), ADHD, Combined Type/Presentation (28.1%), ADHD, Unspecified (18.5%), and "ADD" (11.0%). Comorbid conditions included learning disability (22.0%), anxiety disorder (17.9%), mood disorder (13.8%), and communication disorder (1.4%). Students were first diagnosed with ADHD either in childhood (i.e., < 12 years, 13.8%), adolescence (i.e., 13-17 years, 22.0%), or adulthood (i.e., >18 years; 64.2%).

A psychologist (84.2%) or school psychologist (15.8%) assessed each student who submitted a professional report and supporting documentation to the college. Most reports (85.6%) were written within the previous three years, with the remainder (14.4%) written within the previous five years as required by the college. A different clinician assessed each student. If the same clinician assessed multiple students, we only included data submitted by the student assessed most recently.

Students were enrolled full-time in a private, residential college. College enrollment was approximately 2,300 undergraduates. The student population was predominantly European-American (65.7%) and female (55.2%), with most students (70%) coming from out of state. Average reported ACT Composite (M = 30), SAT Critical Reading (M = 640), and SAT Math (M = 650) scores were approximately 1.5 to 1.9 standard deviations above the mean for college applicants. The college acceptance rate was approximately 44%. Annual tuition and fees paid by students was $32,000; average total annual cost of attendance was $64,900 (National Center for Education Statistics, 2018).

The college disability office published guidelines for documentation needed to support a student's request for academic accommodations because of ADHD. According to the guidelines, documentation must be recent and include an evaluation by a physician, psychologist, school psychologist, or other licensed professional. (This study only examined evaluations conducted by psychologists or school psychologists.) The evaluation must include a description of the student's symptoms, a description of the student's functioning, a clear diagnostic statement, and recommendations for accommodations. Although not required, students were also encouraged to provide educational and/or medical records supporting a history of ADHD, previous or current pharmacotherapy or psychosocial treatment, and/or a history of formal or informal accommodations.

Procedure

The university's disability director provided redacted documentation submitted by each student to support the student's accommodations. Data for all students who were diagnosed with ADHD, had submitted documentation to the disability office, and were receiving accommodations for that condition in the previous five academic years were included in the study. All documentation submitted by each student was provided to the researchers, including psychological reports, educational records, and medical documentation. To protect confidentiality, staff at

the disability office removed identifying information from the documentation including the names and locations of students, family members, schools, teachers, and medical professionals. The study was approved by the university Institutional Review Board.

Two research assistants independently reviewed documentation to identify the accommodations clinicians recommended in their reports, using a checklist of possible accommodations (Gregg, 2009b). The research assistants also looked for evidence of current and previous functional limitations in the documentation to support these accommodations.

Evidence of functional limitations was defined as any description of academic, social, or occupational problems associated with ADHD symptoms. Examples include earning low grades in school or struggling to complete degree requirements, experiencing problems in interpersonal relationships or other social activities, or difficulty performing work-related tasks or maintaining employment (see American Psychiatric Association, 2013). Although not part of the DSM-5 conceptualization of ADHD, we also accepted other limitations in daily life activities such as problems driving safely, completing household chores, managing finances, and caring for one's physical health (see Barkley, 2015b, 2015c). In all instances, we accepted a broad range of evidence to give clinicians the benefit-of-the-doubt regarding their accommodation decisions. Such evidence must have been distinct from ADHD symptom presentation, however. For example, difficulty sustaining attention in class or forgetting to submit work (two symptoms of ADHD) would not be sufficient evidence unless it limited the student's functioning in some way (e.g., the student was earning low grades or was reprimanded at work because of these symptoms).

Research assistants coded the domain in which each student might have evidence of current functional limitations: academic, social, occupational, or other. They also coded the source of the evidence: (1) students' self-reports during diagnostic interview; (2) other-informant reports, such as an interview with a parent, teacher, or employer about the student's current functioning; or (3) results of an adaptive functioning rating scale completed by the student or another informant.

Finally, research assistants determined whether each student had evidence of previous limitations in functioning. Although DSM-5 requires evidence of ADHD symptoms prior to age 12 years, we accepted any evidence of ADHD-related limitations in functioning prior to beginning college. Such evidence might come from three sources: (1) self- or other-reports, (2) medical records, or (3) educational records. Self- or other-reported evidence included any description of academic, behavioral, or social problems, or a previous ADHD diagnosis in childhood or adolescence as recalled by the student, parent, or teacher. Evidence of limitations based on medical records included any medical documentation showing academic, behavioral, or social problems, a referral for ADHD testing, an ADHD diagnosis, or a prescription for ADHD medication prior to college. Evidence of limitations based on educational records included any school records showing barriers to academic, behavioral, or social functioning prior to college; a referral for ADHD testing, 504 Plan, Individualized Education Program (IEP), Summary of Performance (SOP); or the provision of formal or informal academic accommodations.

We determined inter-rater reliability for students' documentation by calculating the percent agreement among research assistants. Both research assistants independently coded each student's documentation. Agreement was highest for evidence of previous limitations shown by medical records (.95) and lowest for evidence of current limitations based on students' self-reports (.89). Discrepancies were resolved by review and discussion.

Results

Accommodations/Modifications

Table 1 presents the accommodations most frequently recommended by clinicians. The most popular accommodation was additional time on exams. Clinicians who recommended this accommodation suggested 25% additional time (0.7%), 50% additional time (24.1%), 100% additional time (7.3%), unlimited additional time (2.9%), or an unspecified amount of additional time (65.0%). Nearly all (96.4%) clinicians who recommended this accommodation did not indicate the type of exams for which additional time was necessary. The only other accommodation recommended by most clinicians was testing in a separate room.

One-third of clinicians recommended at least one modification to students' exams, assignments, curricula, or method of grading. Modified exams included alternate format exams (e.g., no essay or recall tests; 8.2%); simplified directions (8.2%); shortened length of exams (6.3%); or access to formulas, notes, or the textbook during exams (4.4%). Modified assignments included breaking assignments into parts (10.7%), the ability to submit drafts of assignments prior to final grade (8.8%), and other modifications (3.3%). Modified curriculum included waivers or substitutions for required coursework in a second language (11.3%)

or math (3.1%). Modified grading included use of a different grading rubric (i.e., no penalty for grammatical/spelling errors, 11.9%); use of a different grading scale (4.5%); or the ability to retake exams without penalty (3.8%). Approximately 11.3% of clinicians provided a rationale for the modifications/accommodations that they recommended.

Evidence of Functional Limitations

Approximately 32.1% of students had any evidence of current limitations (Figure 1). Evidence was most likely based on students' self-reports (32.1%) rather than the reports of others (13.8%) or results of an adaptive functioning rating scale (12.6%). When evidence of current limitations was provided, it most likely concerned academic limitations (100%) rather than social (24.0%), occupational (16.0%), or other (8.0%) limitations. When another informant reported limitations, his/her relationship to the student was most likely parent (86.4%) or teacher (50.0%). The most common rating scales were the Global Assessment of Functioning (American Psychiatric Association, 2000; 50%), Behavior Assessment System for Children (Reynolds & Kamphaus, 2015; 25%), Barkley Functional Impairment Scale (Barkley, 2011; 20%), and World Health Organization Disability Assessment Schedule (Üstün, Kostanjsek, Chatterji, & Rehm, 2010; 20.0%).

Approximately 42.1% of students had any evidence of previous functional limitations in their documentation (Figure 1). Evidence of previous limitations was most likely to be based on students' self-reports of academic, behavioral, or social problems prior to college (34.0%) or medical documentation showing an ADHD diagnosis or prescription prior to college (32.0%). Fewer students (25.8%) had educational records showing limitations prior to college, such as behavior problems in school or academic concerns. Approximately 13.2% of students had evidence that they received formal accommodations prior to college (e.g., IEP, SOP, letter from the College Board). An additional 6.9% had evidence of informal accommodations (e.g., letter from a teacher or school principal).

Table 2 shows the percent of students with evidence of functional limitations supporting each recommended accommodation or modification. On average, approximately one-third of students whose clinicians recommended a particular accommodation or modification had evidence of current limitations supporting that accommodation. When evidence was provided, it was usually based on students' self-reports. On average, roughly 40% of students whose clinicians recommended a particular accommodation or modification had evidence of previous limitations, usually based on self-reported problems in childhood or medical records showing a history of pharmacotherapy for ADHD.

Discussion

Students with ADHD face obstacles in their pursuit of postsecondary degrees (DuPaul, Weyandt, O'Dell, & Varejao, 2009). Academic accommodations are designed to remove barriers that limit students' ability to learn and to demonstrate their learning in a manner similar to students without disabilities. A thorough assessment and description of these limitations is essential for accommodation decision-making, implementation, and monitoring. Clinicians who provide this information to disability professionals can facilitate these processes and assist students in reaching their academic and occupational objectives.

Unfortunately, many clinicians do not include information about the impact of ADHD on students' functioning. In our study, only 32% of clinicians provided any description of current limitations in life activities and only 42% provided any evidence of previous limitations or history of accommodations. Although all clinicians assigned an ADHD diagnosis, most of their reports lacked any description of how this condition adversely affected students' day-to-day lives. Instead, clinicians focused chiefly on symptom number and severity and often overlooked the way these symptoms interfered with important activities, such as attending class, taking notes, meeting deadlines, studying for exams, completing tests, and engaging effectively with others. Our findings are similar to those of Nelson and colleagues (2014) who found that the documentation submitted by many college students seeking accommodations also lacked evidence of functional limitations. The lack of information about students' academic, social, or occupational functioning seen in our study is especially noteworthy given that most students were assessed after beginning college. Although their clinicians had access to the college's disability documentation guidelines, many failed to provide information about students' functioning.

Recommendations

The lack of information provided in these reports about students' real-world functioning reduces their usefulness to college disability professionals who must determine the appropriateness of accommodations and implement them in an evidence-based manner. Consequently, our findings lead to five recommendations for clinicians who conduct ADHD

evaluations and disability professionals who use these evaluations to plan and implement interventions for their students.

Clinicians should provide disability professionals with a thorough description of students' functional limitations, independent of symptom number or severity. Empirical research and professional practice recognize the disconnect between students' symptoms and their functional limitations. Previous research has shown only a modest association between the symptom severity and functional limitations experienced by adults with ADHD (Lewandowski et al., 2016). Some students with ADHD function effectively in college without accommodations; other students who fall short of the required symptom count for the ADHD label struggle in academic, occupational, or social settings. According to DSM-5, "it is precisely because impairments, abilities, and disabilities vary widely within each diagnostic category that assignment of a particular diagnosis does not imply a specific level of impairment or disability." Consequently, its authors urge clinicians to gather additional information about students' "functional impairments beyond that contained in the DSM-5 diagnosis" when making disability decisions (American Psychiatric Association, 2013, p. 25). Similarly, the ADAAA considers ADHD a disability only when it substantially limits major life activities. The ADAAA warns, "not every impairment (i.e., diagnosis) will constitute a disability" and "determination of whether an impairment substantially limits a major life activity requires an individualized assessment" (U.S. Department of Justice, 2016, p. 53224).

Students' symptom presentation and diagnostic label can be starting points for accommodation decision-making and planning, but they are insufficient by themselves. Professionals must also look for evidence that symptoms limit students' participation in higher education and select accommodations designed to remove barriers to their full participation in college (Ofiesh, 2007; Ofiesh, Hughes, & Scott, 2004). If reports lack evidence of these limitations, disability professionals must gather this information on their own which may place additional burdens on students. Furthermore, this information must be gathered from multiple informants using multiple methods.

Students' functioning should be assessed by gathering data using multiple methods from multiple informants. In our study, the information that clinicians provided about students' functioning was based largely on students' self-reports during the diagnostic interview. For example, all clinicians who described current functional limitations relied on students' self-reports and roughly 80% of clinicians who described previous functional limitations relied on self-report data. In contrast, only 32% of clinicians reviewed medical documentation, 26% reviewed educational records, and 14% provided data reported by another informant.

The use of self-report data in disability determination is supported by empirical research and clinical practice. The diagnostic interview remains the cornerstone of ADHD assessment for older adolescents and adults (Roberts et al., 2015) and college students in particular (Gordon, Lewandowski, & Lovett, 2015; Ramsay & Rostain, 2015). Furthermore, interviewing students about their current functioning and developmental history is time- and cost-effective, can facilitate students' access to accommodations, and can encourage students to become aware of their strengths and limitations and advocate for their needs. Requiring extensive documentation or testing for ADHD is prohibited by federal regulations (U.S. Department of Justice, 2016). Consequently, current guidelines encourage disability professionals to use students' reports as their primary source of information when making accommodation decisions (AHEAD, 2012).

Nevertheless, clinicians should supplement students' self-report data with information from other informants using other methods (Suhr, Cook, & Morgan, 2017). Multi-method/multi-informant data can compensate for the weaknesses inherent in students' self-report of current functioning or their recollection of childhood functioning (Lewandowski et al., 2013; Mannuzza et al., 2002). Many college students without ADHD report substantial limitations in academic activities characteristic of students with the disorder. In one study, 30% of students without ADHD reported that it takes them longer than their peers to complete assignments, 45% reported significant problems taking standardized tests, 48% said that they needed to work harder than their classmates to earn good grades, and 53% reported substantial limitations in reading comprehension (Lewandowski et al., 2008). When considered in isolation, students' self-reports of academic problems can lead to errors in accommodation decision-making. Clinicians can assist disability professionals by supplementing student-reported data with information from parents, teachers, and other informants who are familiar with students' functioning across settings (Rose, 2013).

Clinicians can also help disability professionals by gathering objective documentation showing a history of functional limitations or the need for accommodations in academic contexts (Suhr et al., 2017). Medical records indicating parental concerns about childhood behavior, a referral for ADHD testing, a previous ADHD diagnosis, or a prescription for psy-

chostimulants, would support students' self-reports of ADHD-related difficulties in childhood. Educational records such as report cards, results of previous testing, a 504 Plan, IEP, or SOP could indicate the need for academic assistance in college. Finally, documentation showing a history of accommodations, either formal (i.e., 504/IEP, letter from the College Board) or informal (i.e., letter from a teacher) could support the need for accommodations. Indeed, the ADAAA (U.S. Department of Justice, 2016), AHEAD guidelines (2012), and disability professionals themselves (Banerjee et al., 2015; Madaus, Banerjee, & Hamblet, 2010) give considerable weight to such documentation when granting accommodations. Although none of the documentation by itself is sufficient to corroborate students' self-reported limitations (see Lindstrom & Lindstrom, 2017; Lovett, 2014), clinicians can facilitate students' transition to college by gathering such documentation from parents, physicians, and schools (Shaw, 2012).

Clinicians can use rating scales to assess the functional impact of ADHD and to monitor the effectiveness of accommodations. Adaptive functioning rating scales estimate the degree to which individuals can effectively and independently perform major life activities in academic, social, occupational, or other settings. Conversely, adaptive functioning scales can also gauge the degree to which individuals experience barriers to their full participation in these settings (Reynolds & Kamphaus, 2015). Unlike ADHD rating scales, which measure symptom number or severity, adaptive functioning rating scales can assess the degree to which symptoms limit students' functioning (Gordon et al., 2015). Most rating scales assess functioning across multiple domains, such as school, work, family life, and interpersonal relationships. They estimate the range and severity of the person's disability and need for support (Lovett et al., 2016). In our study, however, less than 13% of clinicians administered an adaptive functioning rating scale, indicating that practitioners frequently overlook this time- and cost-effective method of assessment.

Adaptive functioning rating scales can be used qualitatively or quantitatively to plan and to monitor accommodations. As qualitative measures, adaptive functioning rating scales can be used to quickly screen students for functional limitations across life domains. Professionals can use students' responses to initiate a more thorough discussion about where support might be needed and which accommodations students might consider most helpful. As quantitative measures, adaptive functioning rating scales offer a numerical estimate of students' functioning in specific contexts that can be used to determine functional impact and the effectiveness of interventions. For example, many adaptive functioning rating scales are norm-referenced; that is, they allow professionals to determine the severity of a student's limitations compared to individuals of the same age and/or gender. Consequently, professionals with education and experience in norm-referenced testing can use students' scores to determine the severity of their limitations compared to peers. Furthermore, professionals might administer an adaptive functioning rating scale before and after implementing accommodations. Significant improvement in a student's ratings would support the effectiveness of accommodations. Professionals could also use baseline and follow-up ratings to document the effectiveness of supports provided to students.

Adaptive functioning rating scales are relatively easy to administer and to interpret. Students and other informants (e.g., parents, teachers) can complete them in 5-10 minutes. Many scales are available in multiple languages or can be administered during an interview. Scoring and quantitative interpretation of these scales typically require graduate-level education in psychology, counseling, education, or a related field and formal training in assessment, although specific user qualifications vary (AERA/APA/NCME Joint Committee on Standards for Educational and Psychological Testing, 2014.).

Three rating scales are especially relevant to disability professionals who work in higher education. The Behavior Assessment System for Children – Third Edition (BASC-3; Reynolds & Kamphaus, 2015) is an omnibus measure of both behavior problems and adaptive functioning for children and young adults. Parallel forms of the BASC-3 can be administered to caregivers and teachers (ages 12 to 21 years) or to students themselves (ages 12-25). Of particular interest is the BASC's inclusion of separate scales assessing ADHD symptoms, executive functioning problems, test anxiety, and functional limitations across multiple contexts. Norms allow comparison to students of the same age and/or gender, other college students, or other young adults with ADHD. Computerized scoring and interpretation facilitate intervention planning and monitoring.

The Barkley Functional Impairment Scale (BFIS; Barkley, 2011) is appropriate for children and adults. It yields an overall measure of functional limitations and subscores across 15 domains (e.g., education, family activities, social life, work). The BFIS-Children and Adolescents scale can be administered to the caregivers of youths aged 6 to 17 years. In contrast, the BFIS-Self-Report or Other-Report scales can be administered to adults aged 18+ years or to anoth-

er informant. Norms are available that can be used to identify substantial limitations for age and gender. Unlike the BASC-3, which has a per-administration cost, the BFIS permits unlimited usage for a flat fee.

Finally, the World Health Organization Disability Assessment Schedule (WHODAS 2.0) is a 36-item measure of adaptive functioning and limitations in major life domains that corresponds to the International Classification of Functioning, Disability, and Health (Üstün et al., 2010). Unlike most other adaptive functioning rating scales, the WHODAS 2.0 is designed to assess functional limitations caused by both physical and mental disabilities; consequently, it may be especially useful to disability professionals working in colleges and universities. Norms for different ages and genders, across various countries, yield scores on six domains: cognition, mobility, self-care, getting along (i.e., social functioning), life activities (e.g., school, work), and community activities. It can be completed by adults, other informants, or clinicians and it has been translated into at least 12 different languages. It may be scored using either a simple arithmetic calculation or an algorithm based on item response theory. The WHODAS 2.0 is available online to qualified professionals without cost (Gold, 2014).

Clinicians can assist disability professionals in determining the appropriateness and duration of additional time accommodations. Additional time accommodations are designed to remove test-taking barriers caused by a disability without introducing construct-irrelevant variance into students' test scores (Gregg, 2012). Additional time can reduce the effects of ADHD on exam performance by lowering anxiety, improving attention and executive functioning, or allowing students time to engage in compensatory strategies. In our study, more than 86% of clinicians recommended additional time. Most clinicians did not specify the amount of additional time that would be necessary to help students overcome barriers created by time limits (65%).

Recent studies question the validity of additional time as an accommodation for students with ADHD. Miller, Lewandowski, and Antshel (2015) compared the reading scores of college students with and without ADHD under standard and extended time conditions. Students with ADHD did not earn lower scores than their classmates without ADHD under standard time. When granted additional time, both groups of students completed more items and earned higher scores than under standard time. Students with ADHD given additional time outperformed students without ADHD under standard time in terms of the number of items completed and their overall scores. A second study examined the relationship between college students' ADHD symptoms and effectiveness of additional time (Lovett & Leja, 2015). Students with the most ADHD symptoms benefited the least from additional time on exams. Altogether, these findings suggest that additional time accommodations should be prescribed judiciously so as not to introduce construct-irrelevant variance into students' exam scores.

Clinicians can help disability professionals determine the appropriateness of additional time accommodations by assessing students' academic fluency (Ofiesh & Hughes, 2002). Students with ADHD who do not show deficits in test-taking speed would not require additional time. If deficits are found on composite measures of academic fluency, clinicians can specify the amount of time necessary to remove these barriers. The arbitrary assignment of 50% or 100% additional time may jeopardize the validity of test scores and invalidate comparisons with other students who complete the test under standard time conditions. In contrast, determining the amount of additional time needed, based on students' actual performance allows disability professionals to make informed, evidence-based accommodation decisions.

Other accommodations and modifications should be recommended cautiously, given the limited data supporting their effectiveness for college students with ADHD. Accommodations, such as testing in a separate room, access to professors' lecture notes or a note-taker, and use of technology during exams, were frequently recommended by clinicians. It is commonly believed that such accommodations are helpful; however, we know little about the effects of these accommodations on students' learning, the validity of test scores generated under nonstandard conditions, and possible iatrogenic effects of accommodations on students who receive them and their classmates who do not (Gregg & Nelson, 2012; Ofiesh & Bisagno, 2009).

For example, testing in a separate room is believed to reduce the effects of ADHD on exam performance by improving attention, decreasing anxiety, or allowing students to engage in compensatory test-taking strategies that would not be possible in a group setting (e.g., reading questions aloud; Gregg & Nelson, 2012). However, only one published study has investigated the efficacy of this accommodation on exam performance. Lewandowski, Wood, and Lambert (2015) administered parallel forms of a standardized reading test to college students in a group and private setting in counterbalanced order. Contrary to expectations, students performed significantly better in the group setting than in the private room. The researchers attributed students' higher test scores to so-

cial facilitation; students might experience increased motivation and better performance when surrounded by classmates who model effective test-taking behavior. Students who complete exams in the classroom may also benefit from opportunities to ask questions from the instructor, which is often not possible in a separate setting.

Similarly, only a handful of published studies have examined the efficacy of access to calculators or word processors during exams (Berger & Lewandowski, 2013; Bouck, 2009; Bouck & Yadav, 2008; Engelhard, Fincher & Domaleski, 2010; Lovett, Lewandowski, Berger, & Gathje, 2010). These studies have generally found that word processors benefit all students, regardless of their disability status. However, use of a calculator is associated with increased test anxiety among students with disabilities, which can compromise test performance. Clearly, more research should be directed at evaluating the effectiveness of well-intended accommodations like these.

Many clinicians recommended modifications to students' exams (23%), assignments (20%), curricula (15%) or method of grading (12%). These modifications varied in the degree to which they likely altered students' educational experiences. For example, some modifications represent only minor adjustments to standard educational practice: breaking assignments into smaller components, simplifying directions on exams. Other modifications may qualitatively change students' learning experience or exam performance: alternative format exams (e.g., multiple choice tests only); access to formulas, notes, or the textbook during exams; use of a different rubric or scale when grading.

Modifications that substantially alter students' learning experiences, method of grading, or essential components of their curriculum may not be consistent with the ADAAA. Although the ADAAA permits exam and course modifications, colleges are not required to grant modifications that "substantially alter the measurement of skills or knowledge the examination is intended to test" (§ 36.309(b)(3); "the course" itself (§ 36.309(c)(3); or "the nature of the goods, services, facilities, privileges, and advantages" offered to students (§ 36.302(a). Although well-intentioned, certain modifications may deprive students of important learning opportunities, send the unintended message that they cannot achieve like their classmates without disabilities, and lower their academic self-efficacy (Norwalk, Norvilitis, & MacLean, 2009). Disability professionals face the challenging task of determining when such modifications appropriately remove construct-irrelevant barriers to students' learning and when they compromise the integrity of students' learning experiences and the validity of test scores. Disability professionals should consult with professors when making these important decisions.

Of course, many of the educational barriers experienced by students with ADHD are best addressed by adopting principles of universal design (Rose & Meyer, 2006). Several instructional accommodations typically provided to students with ADHD could be provided to all students in the classroom. For example, a scribe's notes could be shared electronically with the entire class; professors can post learning objectives, notes, or slides on a learning management system; and lectures could be recorded and shared for students to review (Shinn & Ofiesh, 2012). Moreover, assignments and exams can be modified to reduce or eliminate factors that are not essential to course objectives. For example, all students may be permitted additional time on exams when rapid retrieval or problem solving is not a learning goal. Similarly, all students might be permitted access to a calculator or word processor during exams if arithmetic accuracy or handwriting is not essential to the course (Rappolt-Schlichtmann, Daley, & Rose, 2012). It is likely that such actions would benefit all learners and reduce the need for accommodations that single out individual students or modifications that compromise the validity of students' test scores (Lovett & Lewandowski, 2015).

Limitations and Summary

The primary threat to our study's internal validity lies in the manner with which we operationalized "limitations" when reviewing students' documentation. As in previous research, we interpreted criteria liberally, giving clinicians the benefit-of-the-doubt regarding their diagnostic and accommodation decisions (Nelson et al. 2014). For example, we accepted a wide range of data, regardless of source: student self-reports, other-reports, rating scales, and historical records. We also accepted all evidence of functional limitations, regardless of severity; students did not need to earn failing grades or fall beyond a certain threshold. We accepted evidence of limitations in any domain of functioning (e.g., educational, occupational, social), even if clinicians' accommodations tended to be academic in nature. Finally, we accepted both formal evidence of functional limitations (e.g., a prior ADHD diagnosis, accommodations on the SAT) and informal evidence (e.g., self-reported academic "problems" in elementary school, informal accommodations in high school). Despite this wide range of evidence, most students lacked information about how their ADHD symptoms affected life activities.

It is also possible that clinicians did assess students' academic, social, and occupational functioning, but did not describe their findings in their reports. If this was the case, clinicians must do a better job providing such documentation to college disability specialists, thereby enabling them to make more informed decisions regarding accommodations. At the very least, clinicians can help students and families gather other documentation supporting a need for accommodations in college, such as educational and medical records. Presumably, such documentation will be easier to obtain when students are in primary and secondary school than after they have begun their postsecondary education.

The main threat to our study's external validity is the representativeness of our sample. Although large, it reflects students receiving accommodations for ADHD at only one private college. Unlike many of the students in our study, most students with well-documented histories of ADHD are typically first diagnosed in childhood, experience academic difficulties in primary and secondary school, and continue to experience deficits in attention, concentration, and executive functioning that can limit their academic and occupational achievement as adults (Newman et al., 2012; Weyandt et al., 2013). It is possible that other college students with ADHD might have clearer evidence of functional limitations than the students we examined. Indeed, community college students diagnosed with learning disabilities are more likely to have histories of academic problems and current academic limitations than students diagnosed with learning disabilities at 4-year private colleges (Weis, Speridakos, & Ludwig, 2014). It is possible that the students in our study reflect a subgroup of postsecondary students who first seek the ADHD label after beginning college as an explanation for problems meeting the demands of a rigorous, postsecondary education (Suhr & Wei, 2013, 2017). Future research should include students attending other postsecondary institutions to determine the generalizability of our findings.

Despite these limitations, our study reveals a lack of attention to the academic, social, and occupational barriers experienced by students with ADHD in their psychological reports and supporting documentation. To maximize the value of ADHD evaluations, clinicians should more thoroughly assess and describe students' functioning across major life domains. Such information can facilitate accommodation decision-making, help disability professionals select accommodations tailored to students' needs, and monitor the effectiveness of their services.

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Table 1

Accommodations and Modifications Recommended by Clinicians

Accommodation/Modification	**Percent**
Accommodation	
Additional time on exams	86.2
Testing in a separate room	54.1
Scribe/note-taker	29.6
Additional rest breaks during exams	28.3
Access to professor's notes	24.5
Permission to record lectures	20.1
Use technology on exams	19.2
Preferential seating	18.9
Preferential registration	15.7
Recorded books	11.3
Modification	
Modified exams	22.6
Modified assignments	19.5
Modified curriculum	14.5
Modified grading	11.9

Note. Only accommodations/modifications recommended by more than 10% of clinicians are shown.

Table 2

Percent of Students with Evidence of Functional Limitations for Each Recommended Accommodation/ Modification

	Current Impairment (%)				Previous Impairment (%)			
	Self-Report	Other-Report	Rating Scale	Any	Self-Report	Medical Records	School Records	Any
Accommodation								
Additional time on exams	34.3	15.3	10.9	34.3	35.8	33.5	27.0	43.8
Separate room	33.7	19.8	11.6	33.7	34.9	34.9	27.9	45.3
Scribe/note-taker	34.0	14.9	12.8	34.0	38.3	38.3	27.7	46.8
Additional rest breaks	35.6	20.0	11.1	35.6	42.2	40.0	28.9	46.7
Access professor's notes	28.2	12.8	10.3	28.2	25.6	25.7	23.1	30.8
Record lectures	37.5	18.8	15.6	37.5	40.6	34.4	31.3	46.9
Use technology on exams	32.1	21.4	10.7	35.7	39.3	32.1	25.0	42.8
Preferential seating	43.3	30.0	16.7	43.3	43.3	40.0	40.0	56.7
Preferential registration	27.0	16.7	22.2	27.8	38.9	38.9	22.2	38.9
Recorded books	27.8	16.7	22.2	27.8	38.9	38.9	22.2	38.9
Modification								
Modified exams	30.6	16.7	13.9	30.6	30.6	30.5	25.0	38.9
Modified assignments	35.5	25.8	16.1	35.5	48.4	48.4	35.5	61.3
Modified curriculum	63.2	31.6	0.0	63.2	34.8	34.8	13.0	39.1
Modified grading	26.1	13.0	8.7	26.1	52.6	52.6	31.6	68.4

Note. Current limitations are based on (1) student's self-report, (2) another informant's report, (3) an adaptive functioning or impairment rating scale completed by student, another informant, or clinician, or (4) any evidence. Previous limitations are based on (1) student's self-report, (2) medical records, or (3) school/educational records, or (4) any evidence.

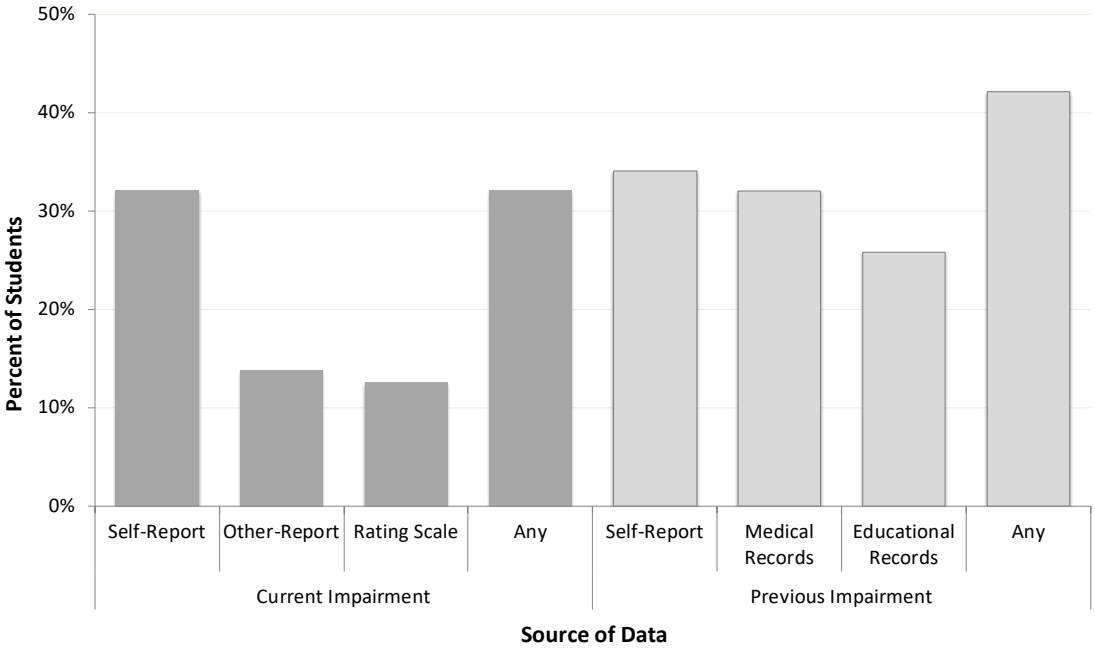

Figure 1. Percent of students with evidence of current or previous limitations based on various sources of data.