



A New Organizational and Study Skills Intervention for College Students with ADHD

Cynthia M. Hartung, *University of Wyoming*

Will H. Canu, *Appalachian State University*

Judah W. Serrano, John M. Vasko, Anne E. Stevens, Tamara M. Abu-Ramadan,
University of Wyoming

Elizabeth A. Bodalski, Emily N. Neger, Rachel M. Bridges, LaDonna L. Gleason,
Christopher Anzalone, Kate Flory, *University of South Carolina*

The transition to college can be very challenging for individuals with ADHD. Increased task and life demands happen in tandem with deficits in time management, study skills and habits, and delaying rewards to achieve longer-term goals. Cognitive-behavioral treatment (CBT) holds promise for targeting these and related challenges. Psychosocial interventions exist for the general population of adults with ADHD, but not college students. Importantly, an intervention designed for college students should be manageable in terms of time and cost. We developed such an intervention specifically for college students with ADHD; organizational, time management, and planning (OTMP) skills were the focus of this largely behavioral treatment, as these most directly relate to the executive function deficits characteristic of ADHD and to the demands of college. Academic study skills and psychoeducation regarding ADHD and medication management were also included. The intervention was tested with 30 undergraduate, post-baccalaureate, and graduate students (57% biological males; M age 22.6; 83.3% White/Non-Hispanic) from two public universities in the U.S. Participants completed a battery of self-report measures of ADHD symptoms, impairment, and OTMP skills pre- and post-treatment. Most participants reported a past diagnosis of ADHD ($n = 23$; including possible comorbidity), with all others reporting at least 5 pre-treatment symptoms of inattention (M for all participants = 6.3). The manualized intervention consisted of 6 group therapy sessions and 2 individual sessions. Results suggested that this new treatment has promise, with t-tests comparing pre- and post-intervention scores indicating significant improvements in inattention symptoms, total ADHD symptoms, self-concept impairment, total impairment, and use of organization, time management, and planning skills. In addition, participants generally reported satisfaction with the intervention and had a very high attendance rate. Future studies of this new intervention should include a randomized controlled trial, the collection of objective outcome measures, and a more diverse sample.

THE transition to college can be challenging for any student to navigate. There is a sudden loss of family structure, less individualized instruction, an increased need to manage one's own schedule, and greater access to alcohol and drugs. For individuals with attention-deficit/hyperactivity disorder (ADHD), this transition is even more challenging (Knouse &

Fleming, 2016). Research on emerging adults with ADHD has found that while hyperactivity and impulsivity tend to decline with development, inattention and self-regulatory deficits are more likely to remain into adulthood and continue to be associated with functional impairments (Stavro et al., 2007). Students with ADHD are less likely to attend college, more likely to have lower grades and be on academic probation (Heiligenstein et al., 1998; Norwalk et al., 2009), and are at higher risk for dropping out than students without ADHD (Murphy et al., 2002). Furthermore, common comorbidities that the ADHD group may experience would likely exacerbate such issues (e.g., learning disorders; Shifrer et al., 2013).

Keywords: ADHD; College students; organization; time management; CBT

1077-7229/20 © 2020 Association for Behavioral and Cognitive Therapies. Published by Elsevier Ltd. All rights reserved.

These struggles may in part be due to difficulties with time management (Reaser et al., 2007), poor study skills and habits (Advokat et al., 2011; Chevalier et al., 2017; DuPaul et al., 2009; Knouse et al., 2012; Murray & Wren, 2003), and difficulty putting off short-term rewards in favor of long-term goals (Knouse & Fleming, 2016; Shaw et al., 2013). Further, ADHD in college students is often comorbid with other *DSM-5* disorders, such as anxiety, depression, autism spectrum disorder, or substance use disorder (Anastopoulos et al., 2020), each of which may pose additional executive functioning, attentional, or emotional regulation challenges. Even with the use of stimulant medication and academic accommodations, the achievement gap between those with ADHD and those without persists (Advokat et al., 2011), indicating an urgent need for more psychosocial interventions targeting the academic challenges faced by college students with ADHD.

Currently, there are few such services available on college campuses. Thomas et al. (2015) found that only 38% of college health care providers recognized ADHD as a “problem” on college campuses. They also found that care for students with ADHD is often fragmented or outsourced. Providers at student health care centers may be reticent to treat ADHD pharmacologically, perhaps out of concern for medication abuse and diversion and student malingering of ADHD symptoms, reflected by relatively low rates of assessment and treatment of the disorder on campuses in the United States (Amyx et al., 2015; Green & Rabiner, 2012). However, Canu and colleagues found that most on-campus providers do not often offer psychosocial services that are specifically tailored to college students with ADHD (Sorrell et al., 2018). Furthermore, many college students with ADHD, as would be true for the college population at large, will have limited access to services outside of the campus setting due to time, financial, and transportation limitations, further limiting their treatment options.

To address the lack of available services, efforts have increased in recent years to develop and examine psychosocial interventions for college students with ADHD (see He & Antshel, 2017, and Prevatt, 2016, for recent reviews). Although these interventions have varied significantly in terms of research support, theoretical orientation, and method of delivery, treatments that have shown the most promising efficacy tend to be those that include cognitive-behavioral therapy (CBT) techniques. The following review focuses on existing CBT treatments that our new intervention builds upon.

Individual Interventions

Several studies examining individual-based psychosocial interventions for college students with ADHD have been published. Some have featured ADHD coaching (Prevatt et al., 2011; Prevatt & Yelland, 2015; Swartz et al., 2005), self-monitoring (Scheithauer & Kelley, 2017), or mindfulness (Gu et al., 2018), but only two took a more traditional, or “second-wave,” CBT approach (Eddy et al., 2015; Van der Oord et al., 2018). These individual-level CBT treatments focused on helping participants set and monitor treatment goals, and also covered topics such as the effective use of planners, psychoeducation about ADHD, organizational and planning skills, prioritization of tasks, breaking down large tasks, strategies for reducing distractibility, adaptive thinking techniques, overcoming procrastination, and preventing relapse.

Overall, the individual CBT approaches demonstrated good results, with Van der Oord et al. (2018) showing that, compared with the waitlist control group ($n = 28$), students in the treatment group ($n = 30$) improved on inattention, attitude, motivation, time management, test strategies, and executive functioning/planning tasks. In Eddy et al. (2015), Canu and colleagues reported modest improvements in core ADHD symptoms across the four students in the study, but noted that results varied by individual, particularly for inattention, where one student saw very large improvement while the other three resulted in very little or no change. This study also showed that domains of functioning improved consistently for participants, both in number and extent of domains affected and in subjective severity of distress across domains.

Group Interventions

In addition to the research conducted with individual treatment of college students with ADHD, several studies have been published that feature primarily group intervention designs. LaCount et al. (2015) adapted a CBT intervention for adults with ADHD (Safren et al., 2005) to include 10 weekly group sessions and 10 weekly individual sessions. Minor modifications for college students were made. Modules included psychoeducation, organization, planning, reducing distractibility, adaptive thinking, and avoiding procrastination. Results were promising, with participants ($n = 12$) showing reduced self-reported inattentive symptoms (per the Barkley Current Symptoms Scale, CSS-SR; Barkley & Murphy, 2006) and improvements in functioning in school and work settings (per the Weiss Functional Impairment Rating

Scale, WFIRS, Weiss, 2000). Trends were noted for improvements in hyperactivity/impulsivity (CSS-SR) and for self-concept and life skills (WFIRS) with small to large effect sizes evident; however, these changes failed to reach statistical significance, likely due to sample size and low statistical power (LaCount et al., 2015).

Because it was difficult to fit 20 sessions into a college semester, Hartung and colleagues also conducted a dismantling study to determine whether a smaller dose of CBT would also be effective (LaCount et al., 2018). This intervention included three sessions of organizational, time management, and planning skills training (OTMP) adapted from another treatment for adults with ADHD (Solanto, 2011). Participants were 37 college students who had elevated levels of inattentive and hyperactive/impulsive ADHD symptoms and academic impairment but were not treatment-seeking (LaCount et al., 2018). Students who met inclusion criteria were invited to participate in the OTMP intervention group. Students who expressed interest but could not attend the intervention group due to scheduling conflicts were invited to participate in an online control group. Individuals in the intervention group ($n = 22$) attended three weekly, 1-hour group sessions and individuals in the comparison group ($n = 15$) completed a set of online questionnaires on two occasions during the semester. The group sessions covered time awareness and scheduling, task and motivation management, and implementation of an organizational system. Results showed that, compared to the comparison group, those in the intervention group reported significant improvements in ratings of inattentive and hyperactive/impulsive symptoms of ADHD (as measured by the Barkley Adult ADHD Rating Scale-IV, BAARS-IV, Barkley, 2011), as well as improvements in academic impairment (as measured by the WFIRS, Weiss, 2000). Those in the intervention group also reported an increase in their use of OTMP skills, compared to baseline (LaCount et al., 2018).

Anastopoulos et al. (2020) also used CBT interventions for adults with ADHD (Safran et al., 2005; Solanto, 2011) with adaptations to fit the specific needs of college students. Their intervention is structured for two consecutive semesters, with an active phase in the first term followed by a maintenance phase in the second. The aforementioned open clinical trial included 88 students who attended 6 to 10 group CBT sessions during the active phase that were designed to concurrently cover psychoeducation about ADHD, behavioral strategies that promote improved executive functioning, and cognitive therapy. This was combined with weekly 30-minute, individual mentoring sessions where they reviewed group materials and homework, and weekly goals. While less structured, the maintenance

phase includes additional group and mentoring sessions that are focused on troubleshooting and fine tuning skills that have been taught in the active phase. Participants in the Anastopoulos et al. (2020) study improved in self-reported inattention and hyperactivity/impulsivity (Conners' Adult ADHD Rating Scale, CAARS, Conners et al., 1999), and showed executive functioning improvements in behavioral regulation and metacognition (Behavior Rating Inventory of Executive Function-Adult Version; BRIEF, Gioia et al., 2000). Additionally, participants' use of campus disability-related services and accommodations increased significantly following active treatment; ADHD medication use also increased across all phases. We do not view these increases as *negative* outcomes, but rather, as *positive* outcomes involving more appropriate and consistent use of resources.

Finally, Fleming et al. (2015) conducted a pilot study of a group intervention derived from dialectical behavior therapy (DBT) for adults with borderline personality disorder (Linehan, 1993). The DBT intervention was adapted for college students with ADHD. Thirty-three undergraduate students meeting criteria for ADHD were randomized to either an active treatment condition of weekly group skills training ($n = 17$) or to a control condition ($n = 16$) where they received skills handouts from a widely available adult ADHD self-help book over the 8-week intervention phase. While primarily a group-delivered intervention, the DBT skills training condition included weekly pre-group individual sessions to enhance motivation and weekly coaching phone calls to promote application of the skills learned in the group. DBT skills focused on mindfulness, daily planner use, structuring environment, health-conscious behaviors, generalizing and troubleshooting, and emotion regulation. The content in the control condition handouts overlapped somewhat but focused mainly on OTMP and stress management. Compared to controls, participants in the skills group intervention showed increases in subjective quality of life ratings, greater improvement in ADHD symptoms (BAARS-IV), and significant improvement in executive functioning. Given the content overlap, it may be that the medium of intervention (in-person versus self-help) was an important difference that mediated the better response with DBT.

Developing a New Intervention Specifically for College Students With ADHD

Taken together, the above studies showed that CBT-focused psychosocial treatments for college students with ADHD could be promising. However, some aspects of the interventions designed for a general pop-

ulation of adults with ADHD are not as relevant to college students with ADHD, and hence needed revision or substitution. For instance, [Safren et al. \(2005\)](#) have a component related to organization in which clients are directed to organize their papers, something that becomes more relevant when one has a home, or an office, and that college students, in our experience, do not seem to experience. Additionally, it is important for an intervention designed for college students to fit in a semester and be manageable in terms of time commitment and cost. As noted above, another reality is that many college students with ADHD will experience comorbid disorders ([Anastopoulos et al., 2020](#)), which is something that any new psychosocial intervention for ADHD in this population should take into account.

We therefore developed a new organization and study skills intervention designed specifically for college students with ADHD and tested this treatment in groups that included participants with a wide range of comorbid symptoms or disorders. Organizational, time management, and planning (OTMP) skills were chosen as the focus for this new intervention, as they most directly relate to the executive function deficits characteristic of ADHD and are particularly relevant to the demands of college. These skills also appear to be a common aspect of all effective treatments described above and were found to be particularly supported in a review by [Knouse and Safren \(2010\)](#). OTMP modules in the new intervention focus on helping students implement a calendar and to-do list, prioritize tasks, use rewards for successful task completion, and decrease procrastination.

Academic study skills modules and psychoeducation modules regarding symptoms of ADHD and medication management were also included. Research has demonstrated that students with ADHD are less likely to use effective academic study skills, are more likely to struggle with note-taking, summarizing, and test-taking than students without ADHD, and are less likely to show persistence in the face of challenging work ([Reaser et al., 2007](#)). To address these concerns, the academic study skills module was included to teach participants strategies for effectively and consistently taking notes on lectures and readings, increasing motivation through the use of self-reinforcement, and minimizing distractions in the study environment. Of note is that none of the adult ADHD interventions that were previously adapted for college students included a dedicated section on academic interventions because this is not relevant to the majority of adults who are no longer students.

The psychoeducation module was included because emerging adults with ADHD often have a limited understanding of the disorder, particularly regarding evidence-based treatments that exist for it. Further-

more, most students with ADHD do not fully understand the benefits of combining medication with psychosocial treatment. These misconceptions may lead to medication discontinuation, nonadherence, and/or misuse (e.g., recreational use; [Wong et al., 2009](#)). Research has found that 30% of students prescribed ADHD medication misuse it at some point in their college career ([Rabiner et al., 2009a, 2009b](#)). Although students generally believe that stimulant misuse (e.g., taking a larger dose, more frequent use than prescribed) is helpful academically, they also report that they experience a number of adverse effects including headaches, stomachaches, irritability, and sleep problems ([Rabiner et al., 2009b](#)). A psychosocial intervention combining OTMP strategies, academic study skills, and ADHD psychoeducation that includes a focus on the risks associated with medication misuse may diminish stimulant misuse in both students with an official diagnosis of ADHD as well as those who struggle with undiagnosed, clinically significant symptoms of the disorder.

The Current Study

In the current study, we assessed the effectiveness of this new CBT intervention tailored specifically for college students with ADHD. The intervention took place in two university-based psychology training clinics in an effort to maximize accessibility for the student populations. Detailed descriptions of the specific treatment modules are provided below. We hypothesized that student participants would show improvement in organizational, time management, and planning skills from pre- to post-group measures, as well as a reduction in ADHD symptoms and related impairment.

Method

Participants

Participants in this study were undergraduate, post-baccalaureate, and graduate students from two public universities in the United States: a medium-sized university in the Rocky Mountain region and a large Southeastern university, both with predominantly White student populations. Flyers advertising the treatment were distributed via the list-serves of various organizations across the two campuses (e.g., University Disability Support Services, Student Health Services, University Counseling Center, and the Psychology Clinic) and were also posted in campus academic, residential, and community buildings. A few in-person referrals were made by providers at the University Counseling Centers or through the Psychology Clinics. Students with a previous diagnosis of ADHD or who reported at least five current symptoms of inattention

participated in the treatment to acquire new organizational and time-management skills.

The final sample consisted of 30 students (56.7% biological males) who were seeking treatment for ADHD or related impairment. Participants ranged in age from 18 to 32 years ($M = 22.63$, $SD = 3.99$) and were primarily White/Non-Hispanic (83.3%). Participants consisted of 20 undergraduate students, 8 graduate students, and 2 postbaccalaureate students who were planning to attend graduate school. All participants completed the treatment in a combined group and individual format; four treatment groups had 6 to 8 participants each. Attendance at mandatory group sessions was very high (87%), and attendance at mandatory and optional individual sessions was also high. Specifically, participants attended 5.32 out of 6 required group sessions, all required individual sessions (2 out of 2), and 1.64 out of 3 optional individual sessions. For the 12 participants who did not attend all group sessions, 58.3% reviewed the missed group session material during individual make-up sessions (see Table 1 for a schedule and structure of each session).

Twenty-three participants had a previous diagnosis of ADHD and the other 7 participants self-reported substantial ADHD symptoms (i.e., at least 5 or more self-reported inattentive symptoms). Many of those with and without reported ADHD indicated other disorders (e.g., internalizing, autistic spectrum, learning disorder) as part of their history, as detailed in Table 2. Based on a self-report *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., *DSM-5*; American Psychiatric Association [APA], 2013) ADHD symptom checklist, the average number of current inattention symptoms reported by participants at baseline was above the *DSM-5* cutoff of five required for an ADHD diagnosis in adults ($M = 6.27$, $SD = 2.00$). The average number of hyperactivity/impulsivity symptoms reported by participants at baseline was subthreshold ($M = 3.23$, $SD = 2.03$), but this is not surprising given the expected mix of predominantly inattentive and other presentations and that hyperactive-impulsive symptoms typically decrease with age. On the CAARS DSM-IV Total ADHD Score, the mean for females ($n = 13$) was 32.54 ($SD = 8.52$) and the mean for males

Table 1
Schedule and Structure of Presented Topics during ADHD Intervention

Session	Topic	Format	Topic & Activities
Intake	Pre-program data	Individual	Individual intake session (e.g., collection of pre-program data & program overview)
1	OTMP skills	Group	Choosing & beginning to use calendar & task list system (e.g., putting all appointments including recurring classes in your calendar to promote better time management)
2	OTMP skills	Individual	Continuing to use a calendar & task list system (e.g., integration of course assignments & deadlines; regularly checking grades to ensure no assignments are missing from task list)
3	Psychoeducation	Group	Discuss ADHD & evidence-based assessment (EBA) procedures (e.g., describe EBA and ask group members to share whether they have had an EBA in recent years)
4	OTMP skills	Group	Effective academic task prioritization, rewards, and accountability (e.g., urgency and importance grid, study or accountability partners, self-rewards)
5	OTMP skills	Group	Addressing procrastination (e.g., getting started and finishing term papers; breaking large and aversive assignments down into smaller steps)
6	Academic skills	Group	Effective study skills & learning strategies for post-secondary education (e.g., note-taking skills, exam preparation, effective communication with professors)
7	Psychoeducation	Group	Psychosocial & medication treatments for ADHD (e.g., which treatments are research-supported for ADHD in college students; how to be a good consumer of your ADHD medication) & collection post-program data
8	Individual feedback	Individual	Individual follow-up session (e.g., check-in on OTMP strategies and current grades, share pre- and post-program data with clients, and provide recommendations about OTMP booster sessions and possible treatment for comorbid difficulties)

Notes: OTMP = organizational, time management, and planning; This table shows required group and individual sessions. Optional individual sessions, in addition to group, were offered in the same weeks of Sessions 4, 5, and 6.

Table 2

Description of Sample: ADHD and Comorbid Diagnoses

	ASD or SLD only	ANX or DEP only	ASD or SLD and ANX or DEP	No comorbidities	Totals
Past ADHD diagnosis	1	12	4	6	23
>= 5 current IA symptoms	2	2	0	3	7
Totals	3	14	4	9	30

Notes: ADHD = attention-deficit/hyperactivity disorder; IA = inattention; ASD = autism spectrum disorder; SLD = specific learning disorder; ANX = anxiety disorder; DEP = depressive disorder.

($n = 17$) was 28.17 ($SD = 8.44$). Both of these mean scores were greater than the 98th percentile when compared to the CAARS normative sample.

Measures

Social and Developmental History Form

Participants completed a social and developmental history form developed by the researchers to assess background, developmental, and demographic data.

DSM-5 Current Checklist, Self-Report (APA, 2013)

The 18-item checklist is directly adapted from the DSM-5 criteria for ADHD. Participants rated how often they experienced each symptom during the past 6 months on a scale from *Never or Rarely* (0) to *Very Often* (3). Items answered as (2) or (3) were considered positively endorsed as symptoms. In a large survey sample of college students ($N = 3,877$; Lefler et al., 2020), internal consistency reliability was excellent for inattention ($\alpha = .93$) and good for hyperactivity/impulsivity ($\alpha = .88$). In the current smaller sample ($N = 30$), the internal consistency was satisfactory for inattention ($\alpha = 0.73$) and hyperactivity/impulsivity ($\alpha = 0.76$).

Weiss Functional Impairment Rating Scale, Self-Report (Weiss, 2000)

This measure consists of 70 items designed to assess current ADHD-related impairment across seven domains of functioning (i.e., Family, Work, School, Life Skills, Self-Concept, Social, and Risk). Participants indicated how often they were experiencing impairment by rating the items on a four-point scale from *Never/Not at all* (0) to *Very Often or Very Much* (3). We hypothesized that this treatment program might have a positive impact on Work, School, Life Skills, and Self-Concept. Therefore, we did not analyze the Family, Social, and Risk subscales. In addition, the Work subscale was excluded from analyses because it was unclear whether participants had a job during the intervention semester or were rating themselves based on previous jobs. Thus, we analyzed data for School, Life Skills,

and Self-Concept, as well as a Total Score that consisted of all subscales except Work. The psychometric properties of this measure were examined in a large-scale study of college students ($N = 2,093$) by Canu et al. (2016), which found this measure to have excellent internal consistency for the total score ($\alpha = 0.96$), and very good to excellent internal consistency for the subscales ($\alpha = .85$ to $.94$). In the current smaller sample, the internal consistency for the Total Score was good ($\alpha = 0.88$) and internal consistency for the three targeted subscales was adequate to good ($\alpha = 0.74$ to 0.89).

Conners Adult ADHD Rating Scale, Long Version (CAARS; Conners et al., 1998)

The CAARS is a measure of symptoms consistent with a diagnosis of ADHD. The measure has a large normative database ($N = 1,026$), making it a useful metric for comparison between adults with and without ADHD. The response options on the 66 items range from *Not at all, never* (0) to *Very much, very frequently* (3). In the normative sample, both test-retest reliability and internal consistency were very good (alpha or Pearson's $r > .80$) for the CAARS scales and indices. In the current smaller sample, the internal consistency for a few of the subscales was questionable (i.e., $\alpha < 0.70$ for Inattention/Memory Problems, *DSM-IV* Inattention, ADHD Index). However, internal consistency for the *DSM-IV* Total ADHD Symptoms was good ($\alpha = 0.84$). Given the marginal internal reliability of CAARS subscales and overlap with the *DSM-5* checklist, only the CAARS Total ADHD Symptoms subscale was used herein.

Organizational, Time Management, and Planning (OTMP) Self-Report

This measure was created for this study to assess the organizational, time management, and planning skills of the college students in the treatment program. The measure contains 21 items regarding how often respondents have used various OTMP strategies within the past week. Response options range from *Never* (0)

to *Very Often* (3). One item is reverse scored. In the current sample, the internal consistency was satisfactory, $\alpha = 0.77$.

Procedure

The intervention was delivered by advanced graduate student therapists under the supervision of licensed clinical psychologists. The entire intervention cost \$50 to \$80, consistent with each clinic's existing sliding fee schedules. Participants completed pretest measures at the first individual session, or the intake session. Following the 6-week intervention program, participants completed posttest measures.

Intervention Program

The core intervention consisted of six group and three individual therapy sessions (see [Table 1](#)). The first individual session was the intake session, which involved collection of pretest measures and introducing participants to what the group entailed. The second individual session followed the first group meeting and focused on helping participants implement a personalized calendar system (see OTMP description below). The third individual session was the final meeting to wrapup, collect postgroup data and provide further treatment recommendations to individual participants. Participants could request additional individual sessions during and following the course of treatment ([Table 1](#)). The overall intervention was broken down into three main modules: OTMP skills, psychoeducation, and academic skills. While each session meeting was based on only one topic theme, topics were revisited periodically throughout the course of treatment. Group leaders used a treatment manual that outlined session content and was created by the first and second authors. Each session followed a similar structure: (a) review homework from the previous week and problem-solve barriers; (b) introduce and discuss content and skills from the current module; and (c) assign homework for the upcoming week related to new skills. Next, we provide a brief description of the content of each module.

OTMP

Sessions 1, 2, 4, and 5 comprised the organizational, time-management, and planning modules, which principally helped participants to create a personalized system of organization. During the first session, group leaders provided information on creating and implementing calendar and task list systems (i.e., for keeping track of appointments, assignments, and other tasks, and for managing time). Participants were assigned

to create their own organizational system before the second session. Therapists met with participants individually during the second session to provide tailored support to effectively use the calendar and task-list systems, including how to accurately and consistently record pertinent information (e.g., assignments from course syllabi, extracurricular activities). Time was spent in each subsequent session problem solving difficulties and maintaining calendar/task-list skills.

The fourth session focused on effective task prioritization, using rewards for successful task completion, and establishing accountability. Strategies covered included evaluating tasks based on urgency and importance, using scheduled breaks or rewards throughout the day, creating routines, and using implementation intentions (i.e., plans to complete a task in the future when cued by an event or stimulus in the environment; [Gollwitzer, 1999](#)). Session 5 addressed procrastination. Group leaders described how to break large tasks into smaller, more manageable pieces (e.g., "term paper" is actually a set of tasks including topic selection, identifying references, reading and taking notes on references, outlining, writing sections of the paper, and proofreading and editing of the complete paper); participants were also taught CBT strategies to challenge maladaptive thinking about their ability to complete tasks ([Ramsay, 2016](#)). Group leaders supported participants in troubleshooting barriers to follow-through.

Psychoeducation

Sessions 3 and 7 were dedicated to psychoeducation about ADHD. Session 3 covered the core symptoms, history, etiology, and developmental course of the disorder, and group discussion centered on how deficits in executive functioning may affect college students. Group leaders also reviewed other factors that may exacerbate symptoms of inattention and hyperactivity/impulsivity (e.g., environmental factors, medical conditions, and comorbid psychiatric disorders). During Session 7, group leaders outlined psychosocial and medication treatments for ADHD, reviewed evidence-based approaches and facilitated a discussion regarding participants' experience with treatment. Regarding medication treatments for ADHD, we encouraged group members to consult with their medical provider if they were unhappy with their current stimulant medication. Given the concern about medication misuse on college campuses, we discouraged participants from sharing their medication and provided participants with examples of both physical health (e.g., small number of sudden deaths) and legal consequences of sharing medication (e.g., violation of state and federal laws).

The psychoeducation sessions are particularly important for several reasons. First, in our experience treating emerging adults with ADHD, it is often the case that the client knows very little about the underlying nature and developmental implications of the disorder; such clients often state that, at the time of their diagnosis in childhood, very little or even no such information was shared by their treatment provider or parents. Second, emerging adulthood is a time of identity exploration (Arnett, 2000), and learning about their diagnosis may empower the students to consolidate their understanding of the role of ADHD in their sense of self.¹ Next, because of the chronic nature of the disorder, psychoeducation can have a life-long impact on the individuals as they continue to manage their ADHD symptoms. Finally, in our experience with college students with ADHD, many of them have not found the optimal stimulant medication in terms of adequate clinical response and lack of side effects. Therefore, they are either not taking stimulants or not taking them consistently or as prescribed.

Academic Skills

In Session 6, core academic and study skills were introduced. Participants were taught skills for adopting and consistently using a system for taking notes (e.g., during class, while reading text), skills for gathering and retaining important course-related information including exam preparation skills, and how to select and structure effective studying locations to minimize distractions and maximize learning (e.g., *The Pomodoro Technique*, Cirillo, 2006). These techniques were included in this module because research suggests that students with ADHD are less likely to incorporate these skills than those without ADHD. For example, although most students use flashcards to study for exams (Golding et al., 2012), students with ADHD are less likely to use this technique (Knouse et al., 2016). Finally, group leaders provided strategies for effective communication with professors, teaching assistants, and classmates.

Analytic Plan

There were a small number of missing item responses that were addressed by replacing a single missing item value with the participant's mean for other items on the same subscale. A series of one-tailed, paired-samples *t*-tests were conducted using the pre- and post-measures to determine whether there were significant decreases in inattentive, hyperactivity/

¹ One benefit we observed of the group format of this treatment is that peers helped to normalize this process and associated feelings.

impulsivity symptoms and related impairment and an increase in OTMP skill use. Effect sizes for these comparisons are reported using Cohen's *d* (using the pooled standard deviation across pre- and posttreatment measures) to illustrate the magnitude of the differences between pre- and post-measures. Confidence intervals for effect sizes were also calculated (based on Cumming & Finch, 2001; Howell, 2011). Finally, exploratory analyses were conducted to test for effects of biological sex to determine whether the results generalized across sexes (see Hartung & Lefler, 2019).

Results

A power analysis using G-Power 3.1.9.4 (Faul et al., 2007) indicated that 27 participants would be necessary to achieve adequate power (0.80) to detect a medium effect size (*d* = 0.50) using matched pairs *t*-tests. A medium effect size was selected based on prior studies finding medium effects for similar outcomes (e.g., LaCount et al., 2015). A total of 30 students participated in the intervention and completed both pre- and post-intervention measures. Thus, our sample size was adequate for detecting a medium effect.

ADHD Symptoms

Two one-tailed, paired samples *t*-tests were conducted to determine whether participants' report of ADHD symptoms using the DSM-5 ADHD Symptoms Checklist changed from pre- to post-intervention (see Table 3). Inattentive ADHD symptoms decreased from pre- to post-intervention, equating to a small to medium effect (*t* = 2.71, *p* = 0.006, *d* = 0.44). Hyperactive-impulsive symptoms, as measured by the ADHD Symptoms Checklist, did not change significantly from pre- to post-intervention.

Next, a one-tailed paired samples *t*-test was conducted to determine whether self-reports of ADHD symptoms using the CAARS DSM-IV ADHD Total Symptoms changed from pre- to post-intervention. Total ADHD symptoms decreased significantly (*t* = 3.12, *p* = 0.002, *d* = 0.39). This pre-to-post difference was consistent with a small-to-medium sized effect.

ADHD-Related Impairment

A series of one-tailed paired samples *t*-tests were conducted to determine whether participants' ADHD-related impairment, based on the WFIRS, changed from pre- to post-intervention participation. Participants evidenced significantly decreased impairment from pre- to post-intervention on their total WFIRS average score (*t* = 1.71, *p* = 0.049, *d* = 0.24; small-to-

Table 3
Pre- and Postintervention Scores on ADHD and Impairment Measures

Dependent variable	n	Pre-testM (SD)	Post-testM (SD)	t	p (one-tailed)	Cohen's d	95% Confidence interval (d)
<i>DSM-5 Current Checklist</i>							
Inattention	30	6.27 (2.00)	5.30 (2.42)	2.71	0.006	0.44	[0.11, 0.87]
Hyperactivity	30	3.23 (2.03)	3.30 (2.05)	0.31	0.379	0.03	[-0.41, 0.30]
<i>WFIRS Self-Report</i>							
School	30	1.38 (0.50)	1.29 (0.56)	1.43	0.082	0.17	[-0.11, 0.62]
Life Skills	30	1.50 (0.55)	1.40 (0.65)	1.20	0.121	0.17	[-0.14, 0.58]
Self-Concept	30	1.91 (0.77)	1.69 (0.73)	1.95	0.031	0.29	[-0.02, 0.72]
Total	30	1.08 (0.31)	0.99 (0.44)	1.71	0.049	0.24	[-0.06, 0.68]
<i>CAARS Long Version</i>							
DSM-IV Total ADHD	30	30.07 (8.61)	26.83 (7.92)	3.12	0.002	0.39	[0.18, 0.95]
<i>OTMP Self-Report</i>							
Skills Use	30	27.27 (8.69)	33.83 (10.37)	3.05	0.003	0.69	[-0.94, -0.17]

Note: For Cohen's *d*, a small effect size is *d* = 0.2, a medium effect size is *d* = 0.5, and a large effect size is *d* = 0.8 (Cohen, 1988).

medium effect size) and in the Self-Concept domain ($t = 1.95$, $p = 0.031$, $d = 0.29$; small-to-medium effect size). Decreases observed on the School and Life Skills domains did not reach statistical significance.

Organizational, Time Management, and Planning Skills

Finally, a one-tailed paired samples *t*-test was conducted to determine whether OTMP skill usage, based on the OTMP measure, changed from pre- to post-intervention. As predicted, participants' OTMP skill use increased from pre- to post-intervention with a medium-to-large effect size ($t = -2.45$, $p = 0.011$, $d = 0.57$).

Exploratory Analyses With Biological Sex

A series of mixed within-between ANOVAs were conducted to determine whether findings differed by biological sex. For each ANOVA, the outcome measure was included as the dependent variable and the interaction term of the Dependent Variable \times Biological Sex was entered into the model. ANOVAs were conducted for all eight dependent variables shown in Table 3. None of the mixed ANOVAs yielded significant results. However, a power analysis using G-Power 3.1.9.4 (Faul et al., 2007) indicated that 48 participants would be necessary to achieve adequate power (0.80) to detect a medium effect size ($f = 0.25$) of biological sex using repeated-measures, mixed within-between interaction ANOVA (interaction terms are dependent variables by biological sex). Therefore, we may not have had adequate power to detect such an effect.

Case Example

To further demonstrate the benefits of this new intervention program, a case example is presented with identifying information altered to maintain confidentiality. "Owen" was a 19-year-old full-time undergraduate student majoring in biochemistry. Owen was diagnosed with ADHD and a learning disability at the age of 7. During the 3rd through 12th grades, Owen received support for his learning disability through an individualized educational program (IEP); however, he had not previously participated in services directly targeting symptoms related to his ADHD. Additionally, Owen was diagnosed with depression at the age of 17, and he had previously received individual therapy from a psychologist to mitigate these symptoms. Owen was not prescribed any psychiatric medication while enrolled in the treatment program. Upon starting the program, he reported high levels of stress relating to coursework in general, as well as the length of time it took to complete assignments. He also expressed concern that his current academic habits (e.g., difficulty focusing during lectures) would result in failing grades. Further, Owen noted that he was unable to maintain friendships. At pretest, Owen's score was *Much Above Average* on the CAARS DSM-IV ADHD Symptoms Total. Regarding pretest scores on the WFIRS, Owen rated himself as *Impaired* in the domains of School, Life Skills, and Self-Concept. There were several OTMP skills that Owen never used (such as organizing his study materials) or considered to be not applicable to him (such as checking his calendar to see his schedule) at pretest. Additionally, he rated most of his OTMP skill use as occurring "sometimes" or "often."

Response to Treatment

Owen had very good attendance, participating in all required group and individual sessions. Owen reportedly found information presented in both group and individual sessions useful; however, he had slight difficulty incorporating weekly homework assignments into his routine as the group progressed. Throughout the program, Owen continued using a task-list system that he developed (i.e., sticky-notes), noting that it was "effective for his style of learning." During an individual session, the therapist and Owen discussed the benefits of also implementing a calendar system, and Owen agreed to try a digital calendar in addition to using sticky notes. While Owen initially reported difficulty remembering to regularly check his calendar, he later noted this system was generally useful for managing his schedule. Throughout the program, Owen sought advice from the leaders and other group members on how to (a) remember to check his calendar and (b) maintain flexibility in his schedule while using a calendar system. He seemed particularly interested in academic-related strategies (e.g., "chunking" writing assignments; note taking strategies), and he also appeared to enjoy hearing the perspectives and experiences of other group members. Additionally, Owen readily requested individual time with his therapist to talk through additional strategies (e.g., how to stay motivated). Although Owen reported experiencing some ongoing stress related to academic demands, he also noted that he found the program to be useful. Additionally, he expressed that his grades gradually improved over the course of the program.

Many of Owen's assessment measure scores decreased from pre- to posttreatment. Specifically, Owen's posttest scores on the CAARS *DSM-IV* Total ADHD Symptoms moved from *Much Above Average* to *Slightly Above Average*. In addition, Owen's impairment ratings on the WFIRS School and Life Skills decreased and the Life Skills score moved from *Impaired* to *Typical*. Furthermore, his self-report of OTMP skill usage increased by 87%. He used all OTMP skills except for one skill (completing a brief task before adding it to his to-do list) and he rated most of his OTMP skill use as "often" or "very often." This pattern of scores indicates that many of Owen's symptoms improved throughout the program, including symptoms in domains related to his presenting concerns, and that impairment also lessened.

This case example illustrates the ways in which a client's therapeutic outcomes may be enhanced through the use of both individual and group approaches to treatment. For instance, Owen appeared to benefit from the individual appointments, as they allowed for additional time to (a) discuss topics of personal relevance,

(b) problem solve through unique barriers, and (c) work through issues he did not want to discuss with other group members. However, without the inclusion of the group modality, Owen may have been more hesitant to attempt novel strategies, as he appeared motivated by hearing the successes of other group members. Additionally, Owen seemed to benefit from reciprocal peer support during group sessions.

Discussion

Overall, our findings suggest that our new organizational and study skills intervention designed specifically for college students with ADHD has promise as a potential evidence-based treatment. Completion of our protocol, designed to be easily implemented in a single academic term and including some one-on-one therapist contact, yielded significant improvements in core symptoms as well as aspects of impairment that are commonly encountered by this population. Specifically, participants reported diminished inattention, total and specific self-concept impairment, memory problems, and also greater use of OTMP skills. Gains in attentiveness and OTMP skills were the most notable, with effect sizes that were approximately moderate. Further, the CAARS Total ADHD Symptoms score pre-to posttreatment improvement was on par with what has been demonstrated in empirically supported CBT for older adults who also were undergoing concurrent pharmacotherapy (Safren et al., 2010). The Safren group's individually based intervention has not been extensively used in college populations, but the mixed successes evident in the literature (e.g., Eddy et al., 2015), when compared to the current results, suggests that treatments such as this new one that are tailored more to this subgroup of emerging adults are advantageous.

One thing that makes these results even more promising is that the typical trajectory of students with ADHD may in fact be toward deterioration of adjustment over time in college, and stability in symptoms and impairment, alone, might be considered a positive outcome. For instance, Anastopoulos and King (2015) and colleagues (Anastopoulos et al., 2020) found that their ACCESS program for college students with ADHD is associated with improvements in symptoms and some aspects of impairment but, overall, modest change or statistical stability in academic achievement (i.e., grade point average). Similarly, here, our participants reported nonsignificant improvement (i.e., stability) in school-related impairment on the WFIRS. Furthermore, Hartung and colleagues studied at-risk college students who were admitted conditionally to the university and may have had ADHD or other learning disabilities (Stevens et al., 2018). These students

showed improvement in an active treatment group involving classroom-delivered OTMP training, whereas the no-treatment control evidenced worsening of overall adjustment (as measured by the WFIRS). In other words, even some of the nonstatistical changes demonstrated herein could be indicative of a buffering effect that unchecked ADHD might have on college student success.

In addition to the quantitative results, qualitative feedback from the participants in our groups reinforces the treatment's potential utility. Participants generally reported satisfaction with the intervention, both during and after completion, suggesting that it is easily tolerated. This conclusion is supported by the very high attendance rate, and formal feedback regarding helpful aspects of the intervention program. Those that were endorsed as *most helpful* included "task list and calendar system," "schedule/calendar creation and maintenance," "how to avoid procrastination," "the accountability," "persistence [of the therapists]," "one-on-one check-ins," "good combo of individual and group help," "learning about the symptoms of ADHD," and "more knowledge about what the heck is going on in my brain." These ratings speak both to the tolerability of the core OTMP and psychoeducational focus of this intervention, the structure of regular group meetings, and weekly follow-up.

Furthermore, 60% of the students in our treatment groups had comorbid internalizing problems and many of them chose to continue working with their therapist individually to help with these issues after the ADHD group program was complete. Oftentimes, the ADHD group was the individuals' first point of contact to receive psychological services, and individuals were more willing to continue services for other problems after getting acclimated to the therapeutic setting. The ADHD group program, therefore, seems to be a gateway for individuals to seek psychological services for their comorbidities upon completion of the group.

Therapists, too, reported that the treatment group, advertised as a "skill building" activity, was attractive to the participants and was experienced as relatively nonstigmatizing. Of further note, participants nominated "probably hearing from others in the group" as another part of the program that was most helpful, as well as "connecting with others like me," "I got to know I wasn't the only one with it," and "learning about ADHD and coping skills with other people struggling with the same issues." This speaks to the importance of packaging and marketing interventions appropriately for this emerging adult population. In particular, it suggests that the group component of this intervention can further help destigmatize having ADHD and encourage participation. As [Arnett \(2000\)](#) points out,

emerging adulthood is a time of increasing independence and identity formation, but also one in which success in relationships with others, and their perceived opinions, is still of central psychological importance.

Limitations and Future Directions

Although the results of this study are promising, there are several limitations that need to be addressed in future studies. First, this was an open trial with no comparison group. In future studies, it would be optimal if participants were randomly assigned to the treatment group and a waitlist control or other active-treatment group. Next, the outcome measures used in this study were based on self-report. In the future, it would be helpful to include objective outcome measures such as collateral reports and academic data (e.g., grades, credits attempted versus credits completed). Relatedly, a broader array of outcomes could be measured that might better capture treatment effects. For instance, [Anastopoulos et al. \(2020\)](#) found nonsignificant change in terms of GPA, but noted that students completing their ACCESS program took heavier course loads and also earned more class credits, indicating positive but more specific changes in academic status. Furthermore, our sample was small and lacked diversity. Although we conducted exploratory analyses based on biological sex and did not find any significant differences, these analyses were underpowered so we cannot rule out the possibility of sex differences. Thus, we were unable to determine whether the positive results would generalize across sex/gender and race/ethnicity. Studies with larger and more diverse college student samples should be conducted. Finally, the intervention examined in this study demonstrated small (e.g., school impairment, self-concept, risk-taking, hyperactivity/impulsivity) to medium effects (i.e., inattention, memory, OTMP skills use). This could be interpreted as indicating that the treatment might be too brief and that a longer one might produce larger, and possibly longer-lasting, results. To wit, designs that incorporate posttreatment follow-up (e.g., after a subsequent semester or year) would be desirable, as well.

Many of these limitations could be addressed by obtaining grant support for a larger, multisite study that is also a randomized controlled trial. However, this should likely be balanced with the priority of maintaining the treatment duration within a single semester. Further, these preliminary results are not very different from those achieved in longer, more intensive treatment formats (e.g., ACCESS, [Anastopoulos et al., 2020](#)) which bolsters the case for maintaining relative

brevity, although it is unclear at this time whether the current intervention is as durable. Relatedly, future studies of this novel treatment should incorporate long-term follow-up, perhaps a semester or year following active intervention.

To our knowledge, this type of evidence-based intervention for college students with ADHD is likely only available on a handful of campuses across the nation (Sorrell et al., 2018). Future research should examine the acceptability and feasibility of various intervention modalities (e.g., face-to-face group intervention, face-to-face individual intervention, internet-based intervention, comparing individual versus primarily-group treatment modalities) in an effort to determine how we could most effectively make these types of programs more widely available on university campuses. Furthermore, it is possible that this type of intervention could also be helpful for community college students and advanced high school students. Although there are other programs for high school students, these programs tend to be more time and resource intensive (e.g., Challenging Horizons; Evans et al., 2014) and/or require parent involvement (e.g., STAND; Sibley, 2016). As such, this intervention might be effective as a college preparation course for high school students with ADHD, a possibility that researchers and clinicians are encouraged to pursue.

References

- Advokat, C., Lane, S. M., & Luo, C. (2011). College students with and without ADHD: Comparison of self-report of medication usage, study habits, and academic achievement. *Journal of Attention Disorders*, 15(8), 656–666. <https://doi.org/10.1177/1087054710371168>.
- American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC. <https://doi.org/10.1176/appi.books.9780890425596>
- Amyx, M. L., Hastings, K. B., Reynolds, E. J., Weakley, J. A., Dinkel, S., & Patzel, B. (2015). Management and treatment of Attention-Deficit/Hyperactivity Disorder on college campuses. *Journal of Psychosocial Nursing*, 53, 46–51. <https://doi.org/10.3928/02793695-2015021-03>.
- Anastopoulos, A. D., & King, K. A. (2015). A cognitive-behavior therapy and mentoring program for college students with ADHD. *Cognitive and Behavioral Practice*, 22, 141–151. <https://doi.org/10.1016/j.cbpra.2014.01.002>.
- Anastopoulos, A. D., King, K. A., Besecker, L. H., O'Rourke, S. R., Bray, A. C., & Supple, A. J. (2020). Cognitive-behavioral therapy for college students with ADHD: Temporal stability of improvements in functioning following active treatment. *Journal of Attention Disorders*, 24(6), 863–874. <https://doi.org/10.1177/1087054717749932>.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55, 469–480. <https://doi.org/10.1037/0003-066X.55.5.469>.
- Barkley, R. A. (2011). *Barkley Adult ADHD Rating Scale-IV (BAARS-IV)*. Guilford Press.
- Barkley, R. A., & Murphy, K. R. (2006). *Attention-deficit hyperactivity disorder: A clinical workbook* (3rd ed.). Guilford Press.
- Canu, W. H., Hartung, C. M., Stevens, A. E., & Lefler, E. K. (2016). Psychometric properties of the Weiss Functional Impairment Rating Scale: Evidence for utility in research, assessment, and treatment of ADHD in emerging adults. *Journal of Attention Disorders*, 19(1), 1–13. <https://doi.org/10.1177/1087054716661421>.
- Chevalier, T. M., Parrila, R., Ritchie, K. C., & Deacon, S. H. (2017). The role of metacognitive reading strategies, metacognitive study and learning strategies, and behavioral study and learning strategies in predicting academic success in students with and without a history of reading difficulties. *Journal of Learning Disabilities*, 50(1), 34–48. <https://doi.org/10.1177/0022219415588850>.
- Cirillo, F. (2006). *The Pomodoro Technique (The Pomodoro)*. Creative Commons.
- Conners, C., Erhardt, D., & Sparrow, E. (1998). *Conners adult attention rating scale—Self-report: Long version*. Multi-Health Systems.
- Conners, C. K., Erhardt, D., & Sparrow, E. P. (1999). Conners' adult ADHD rating scales (CAARS): Technical manual. MHS North Tonawanda.
- Cumming, G., & Finch, S. (2001). A primer on the understanding, use, and calculation of confidence intervals that are based on central and noncentral distributions. *Educational and Psychological Measurement*, 61(4), 532–574. <https://doi.org/10.1177/00131640121971374>.
- 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>.
- Eddy, L. D., Canu, W. H., Broman-Fulks, J. J., & Michael, K. D. (2015). Brief cognitive behavioral therapy for college students with ADHD: A case series report. *Cognitive and Behavioral Practice*, 22(2), 127–140. <https://doi.org/10.1016/j.cbpra.2014.05.005>.
- Evans, S. W., Schultz, B. K., & DeMars, C. E. (2014). High school-based treatment for adolescents with attention-deficit/hyperactivity disorder: Results from a pilot study examining outcomes and dosage. *School Psychology Review*, 43, 185–202. <https://doi.org/10.1080/02796015.2014.12087444>.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. <https://doi.org/10.3758/bf03193146>.
- Fleming, A. P., McMahon, R. J., Moran, L. R., Peterson, A. P., & Dreessen, A. (2015). Pilot randomized controlled trial of dialectical behavior group skills training for ADHD among college students. *Journal of Attention Disorders*, 19(3), 260–271. <https://doi.org/10.1177/1087054714535951>.
- Gioia, G. A., Isquith, P. K., Guy, S., & Kenworthy, L. (2000). *BRF: Behavior Rating Inventory of Executive Function professional manual*. Psychological Assessment Resources.
- Golding, J. M., Wasarhaley, N. E., & Fletcher, B. (2012). The use of flashcards in an introduction to psychology class. *Teaching of Psychology*, 39(3), 199–202. <https://doi.org/10.1177/0098628312450436>.
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, 54(7), 493. <https://doi.org/10.1037/0003-066X.54.7.493>.
- Green, A., & Rabiner, D. (2012). What do we really know about ADHD in college students? *Neurotherapeutics*, 9, 559–568. <https://doi.org/10.1007/s13311-012-0127-8>.
- Gu, Y., Xu, G., & Zhu, Y. (2018). A randomized controlled trial of mindfulness-based cognitive therapy for college students with

- ADHD. *Journal of Attention Disorders*, 22(4), 388–399. <https://doi.org/10.1177/1087054716686183>.
- Hartung, C. M., & Lefler, E. K. (2019). Sex and gender in psychopathology: DSM-5 and beyond. *Psychological Bulletin*, 145(4), 390–409. <https://doi.org/10.1037/bul0000183>.
- He, J. A., & Antshel, K. M. (2017). Cognitive behavioral therapy for attention-deficit/hyperactivity disorder in college students: A review of the literature. *Cognitive and Behavioral Practice*, 24(2), 152–173. <https://doi.org/10.1016/j.cbpra.2016.03.010>.
- Heiligenstein, E., Conyers, L. M., Berns, A. R., & Smith, M. A. (1998). Preliminary normative data on DSM-IV attention deficit hyperactivity disorder in college students. *Journal of American College Health*, 46(4), 185–188. <https://doi.org/10.1080/0744849809595609>.
- Howell, D. C. (2011). Confidence intervals on effect size. Lecture Handout. Psychology. University of Vermont.
- Knouse, L. E., Anastopoulos, A. D., & Dunlosky, J. (2012). Isolating metamemory deficits in the self-regulated learning of adults with ADHD. *Journal of Attention Disorders*, 16(8), 650–660. <https://doi.org/10.1177/1087054711417231>.
- Knouse, L. E., & Fleming, A. P. (2016). Applying cognitive-behavioral therapy for ADHD to emerging adults. *Cognitive and Behavioral Practice*, 23(3), 300–315. <https://doi.org/10.1016/j.cbpra.2016.03.008>.
- Knouse, L. E., & Safren, S. A. (2010). Current status of cognitive behavioral therapy for adult attention-deficit hyperactivity disorder. *Psychiatric Clinics*, 33(3), 497–509. <https://doi.org/10.1016/j.psc.2010.04.001>.
- Knouse, L. E., Rawson, K. A., Vaughn, K. E., & Dunlosky, J. (2016). Does testing improve learning for college students with attention-deficit/hyperactivity disorder. *Clinical Psychological Science*, 4(1), 136–143.
- LaCount, P. A., Hartung, C. M., Shelton, C. R., Clapp, J. D., & Clapp, T. K. (2015). Preliminary evaluation of a combined group and individual treatment for college students with attention-deficit/hyperactivity disorder. *Cognitive and Behavioral Practice*, 22(2), 152–160. <https://doi.org/10.1016/j.cbpra.2014.07.004>.
- LaCount, P. A., Hartung, C. M., Shelton, C. R., & Stevens, A. E. (2018). Efficacy of an organizational skills intervention for college students with ADHD symptomatology and academic difficulties. *Journal of Attention Disorders*, 22(4), 356–367. <https://doi.org/10.1177/1087054715594423>.
- Lefler, E. K., Stevens, A. E., Garner, A. M., Serrano, J. W., Canu, W. H., & Hartung, C. M. (2020). Changes in college student endorsement of ADHD symptoms across DSM edition. *Journal of Psychopathology and Behavioral Assessment*, 42, 488–499. <https://doi.org/10.1007/s10862-020-09797-5>.
- Linehan, M. M. (1993). *Skills training manual for treating borderline personality disorder*. Guilford.
- Murray, C., & Wren, C. T. (2003). Cognitive, academic, and attitudinal predictors of the grade point averages of college students with learning disabilities. *Journal of Learning Disabilities*, 36(5), 407–415. <https://doi.org/10.1177/0022194030360050201>.
- Murphy, K. R., Barkley, R. A., & Bush, T. (2002). Young adults with attention deficit hyperactivity disorder: Subtype differences in comorbidity, educational, and clinical history. *The Journal of Nervous and Mental Disease*, 190(3), 147–157. <https://doi.org/10.1097/00005053-200203000-00003>.
- Norwalk, K., Norville, J. M., & MacLean, M. G. (2009). ADHD symptomatology and its relationship to factors associated with college adjustment. *Journal of Attention Disorders*, 13(3), 251–258. <https://doi.org/10.1177/1087054708320441>.
- Prevatt, F. (2016). Coaching for college students with ADHD. *Current Psychiatry Reports*, 18(12), 110. <https://doi.org/10.1007/s11920-016-0751-9>.
- Prevatt, F., Lampropoulos, G. K., Bowles, V., & Garrett, L. (2011). The use of between session assignments in ADHD coaching with college students. *Journal of Attention Disorders*, 15(1), 18–27. <https://doi.org/10.1177/1087054709356181>.
- Prevatt, F., & Yelland, S. (2015). An empirical evaluation of ADHD coaching in college students. *Journal of Attention Disorders*, 19(8), 666–677. <https://doi.org/10.1177/1087054713480036>.
- Rabiner, D. L., Anastopoulos, A. D., Costello, E. J., Hoyle, R. H., Esteban McCabe, S., & Swartzwelder, H. S. (2009a). The misuse and diversion of prescribed ADHD medications by college students. *Journal of Attention Disorders*, 13(2), 144–153. <https://doi.org/10.1177/1087054708320414>.
- Rabiner, D. L., Anastopoulos, A. D., Costello, E. J., Hoyle, R. H., McCabe, S. E., & Swartzwelder, H. S. (2009b). Motives and perceived consequences of nonmedical ADHD medication use by college students: Are students treating themselves for attention problems? *Journal of Attention Disorders*, 13(3), 259–270. <https://doi.org/10.1177/1087054708320399>.
- Ramsay, J. R. (2016). "Turning intentions into actions": CBT for adult ADHD focused on implementation. *Clinical Case Studies*, 15(3), 179–197.
- Reaser, A., Prevatt, F., Petscher, Y., & Proctor, B. (2007). The learning and study strategies of college students with ADHD. *Psychology in the Schools*, 44(6), 627–638. <https://doi.org/10.1002/pits.20252>.
- Safren, S., Perlman, C., Sprich, S., & Otto, M. (2005). Therapist guide to the mastery of your adult ADHD: A cognitive behavioral treatment program. <https://doi.org/10.1093/med/9780195188189.001.0001>.
- Safren, S. A., Sprich, S., Mimiaga, M. J., Surman, C., Knouse, L., Groves, M., & Otto, M. W. (2010). Cognitive behavior therapy vs relaxation with educational support for medication-treated adults with ADHD and persistent symptoms. *Journal of the American Medical Association*, 304, 875–880. <https://doi.org/10.1001/jama.2010.1192>.
- Scheithauer, M. C., & Kelley, M. L. (2017). Self-monitoring by college students with ADHD: The impact on academic performance. *Journal of Attention Disorders*, 21(12), 1030–1039. <https://doi.org/10.1177/1087054714553050>.
- Shaw, P., Malek, M., Watson, B., Greenstein, D., de Rossi, P., & Sharp, W. (2013). Trajectories of cerebral cortical development in childhood and adolescence and adult attention-deficit/hyperactivity disorder. *Biological Psychiatry*, 74(8), 599–606. <https://doi.org/10.1016/j.biopsych.2013.04.007>.
- Shifrer, D., Callahan, R. M., & Muller, C. (2013). Equity or marginalization? The high school course-taking of students labeled with a learning disability. *American Educational Research Journal*, 50, 656–682. <https://doi.org/10.3102/0002831213479439>.
- Sibley, M. H. (2016). *Parent-teen therapy for executive function deficits and ADHD: Building skills and motivation*. Guilford Press.
- Solanto, M. V. (2011). *Cognitive-behavioral therapy for adult ADHD: Targeting executive dysfunction*. Guilford Press.
- Sorrell, A. E., Canu, W. H., Parrish, K., & Holzworth, L. (2018). Availability and transparency of university-based services for students with ADHD. In Poster presented at the 52nd annual convention of the association for behavioral and cognitive therapies, Washington, DC.
- Stavro, G. M., Ettenhofer, M. L., & Nigg, J. T. (2007). Executive functions and adaptive functioning in young adult attention-deficit/hyperactivity disorder. *Journal of the International Neuropsychological Society*, 13(2), 324–334. <https://doi.org/10.1017/s1355617707070348>.
- Stevens, A. E., Hartung, C. M., Shelton, C. R., LaCount, P. A., & Heaney, A. (2018). The effects of a brief organization, time management, and planning intervention for at-risk college

- freshmen. *Evidence-Based Practice in Child and Adolescent Mental Health*, 4(2), 202–218. <https://doi.org/10.1080/23794925.2018.1551093>.
- Swartz, S. L., Prevatt, F., & Proctor, B. E. (2005). A coaching intervention for college students with attention deficit/hyperactivity disorder. *Psychology in the Schools*, 42(6), 647–656. <https://doi.org/10.1002/pits.20101>.
- Thomas, M., Rostain, A., Corso, R., Babcock, T., & Madhoo, M. (2015). ADHD in the college setting: Current perceptions and future vision. *Journal of Attention Disorders*, 19(8), 643–654. <https://doi.org/10.1177/1087054714527789>.
- Van der Oord, S., Boyer, B., Van Dyck, L., Mackay, K., De Meyer, H., & Baeyens, D. (2018). A randomized controlled study of a cognitive behavioral planning intervention for college students with ADHD: An effectiveness study in student counseling services in Flanders. *Journal of Attention Disorders*, 24(6), 46–57. <https://doi.org/10.1177/1087054718787033>.
- Weiss, M. D. (2000). *Weiss Functional Impairment Rating Scale (WFIRS) Self-Report*. Retrieved from. Vancouver, Canada: University of British Columbia <https://www.caddra.ca/wp-content/uploads/WFIRS-S.pdf>.
- Wong, I., Asherson, P., Bilbow, A., Clifford, S., Coghill, D., DeSoysa, R., Hollis, C., McCarthy, S., Murray, M., Planner, C., Potts, L., Sayal, K., & Taylor, E. (2009). Cessation of attention deficit

hyperactivity disorder drugs in the young (CADDY)-pharmacoepidemiological and qualitative study. *Health Technology Assessment*, 13(50), 1–144. <https://doi.org/10.3310/hta13500>.

The authors thank the following individuals for their contributions to this manuscript: Stephanie Amaya, Angeline R. Bottera, Morgan E. Longstreth, Kandice M. Perry, Katy Richardson, Gabriella Zeller, and Lauren Zimmerman. The first, third, and fourth authors were supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under Grant # 2P20GM103432. None of the authors have any competing interests to report.

Address correspondence to Cynthia M. Hartung, Department of Psychology, University of Wyoming, 1000 E. University Ave., Department 3415, Laramie, WY 82071. e-mail: chartung@uwyo.edu

Received: May 12, 2020

Accepted: September 18, 2020

Available online xxxx