

Preliminary Evaluation of a Combined Group and Individual Treatment for College Students With Attention-Deficit/Hyperactivity Disorder

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The aim of the current study was to investigate the preliminary effects of a CBT intervention, designed for adults with ADHD (Safren, Perlman, et al., 2005), adapted to a combined group and individual format for college students with ADHD. Participants included undergraduate and graduate students with the final sample consisting of 12 completers and 5 noncompleters. Treatment effectiveness was examined by comparing changes in baseline and post treatment levels of ADHD symptoms and functional impairment for these college students receiving both individual and group CBT. For this preliminary study, there was no comparison group. The adapted intervention resulted in significantly lower levels of inattention symptoms in completers. Further, completers reported significant improvement in functioning at school and work. Although the data showed no statistically significant reduction in hyperactivity/impulsivity or the other measured areas of life impairments, estimates of effect size suggest that the small sample size might have limited the detection of statistically significant differences in both hyperactivity/impulsivity and impairment in certain domains (i.e., self-esteem and daily living skills). Preliminary data suggested that the adapted intervention was effective in reducing symptoms and impairment in several critical areas. Limitations and directions for future research are discussed.

ATTENTION-DEFICIT/ hyperactivity disorder (ADHD) is characterized by significant impairment in daily functioning as a result of difficulties with attention, impulse control, and activity-level modulation (American Psychiatric Association [APA], 2000). Although ADHD has traditionally been viewed as a disorder of childhood and adolescence, research conducted in the last 15 years has suggested that ADHD-related symptoms and functional impairment frequently persist into adulthood (Mick, Faraone, Biederman, & Spencer, 2004; Spencer, Biederman, Wilens, & Faraone, 1998; Wilens, Biederman, & Spencer, 2002).

Adolescents with ADHD who seek postsecondary education are at higher risk for poor academic achievement and are less likely to graduate from college than their typically developing peers (Barkley, Murphy, & Fischer, 2008; Frazier, Youngstrom, Glutting, & Watkins, 2007; Heiligenstein, Guenther, Levy, Savino, & Fulwiler, 1999). Recent research based on the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV-TR*; APA, 2000) suggested between 2% and 8% of college students met criteria for ADHD and that 25% of students receiving

university-based disability services were diagnosed with ADHD (DuPaul, Weyandt, O'Dell, & Varejao, 2009).

The beginning of college brings a transition from adolescence to *emerging adulthood* (ages 18 to 25; Arnett, 2000) in which a unique confluence of developmental and environmental factors yields a distinctive set of challenges, especially for college students with ADHD. Subsequently, many individuals with previously undiagnosed ADHD experience significant impairment for the first time (Quinn, 2001). In addition to academic difficulties, college students with ADHD are at higher risk for marked impairment across several critical domains, including occupational, psychological, and social (Norwalk, Norvilitis, & MacLean, 2009; Safren et al., 2010; Shaw-Zirt, Popali-Lehane, Chaplin, & Bergman, 2005; Shifrin, Proctor, & Prevatt, 2010). This is especially disconcerting since adjustment during this crucial period of development often predicts adjustment into adulthood (Schulenberg, Sameroff, & Cicchetti, 2004).

The primary treatments used to help college students cope with their ADHD symptoms include: (a) pharmacotherapy and (b) psychosocial treatments. Similar to the pharmacological treatment of ADHD among children, adolescents, and adults, stimulant medications (e.g., methylphenidate) are the most frequently prescribed for college students (Baverstock & Finlay, 2003). Although these medications are moderately effective in ameliorating core symptoms of ADHD among adults, they have been found to

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have a number of practical limitations (Hartung, Canu, Cleveland, et al., 2013; Weiss & Hechtman, 1993; Wilens, Biederman, & Spencer, 1998; Wilens et al., 2002). Given the concerns regarding the overall costs and benefits of stimulants, adjunctive psychosocial interventions are often recommended (Dulcan & Benson, 1997; Prince, 2006; Wilens et al., 1998); unfortunately, no empirical reports testing the efficacy of psychosocial interventions for college students with ADHD, specifically, have been published.

While significant work remains to be carried out, cognitive-behavior therapy (CBT) has been recommended for treating college students with ADHD, as it appears to be the most effective psychosocial treatment for ADHD among both emerging and mature adults (Rostain & Ramsay, 2006). Several psychosocial interventions for adults with ADHD have been shown to be efficacious in randomized control trials (Knouse, Cooper-Vince, Sprich, & Safren, 2008). Preliminary efficacy studies with emerging and mature adults have yielded promising results for individual CBT (Rostain & Ramsay, 2006; Safren, Otto, et al., 2005; Safren et al., 2010; Virta et al., 2010), group CBT (Philipsen et al., 2007; Salakari et al., 2010; Solanto et al., 2010; Solanto, Marks, Mitchell, Wasserstein, & Kofman, 2008; Stevenson, Whitmont, Bornholt, Livesey, & Stevenson, 2002; Virta et al., 2008; Wiggins, Singh, Getz, & Hutchins, 1999), coaching (Allsopp, Minskoff, & Bolt, 2005; Kubik, 2010; Swartz, Prevatt, & Proctor, 2005; Zwart & Kallemeyn, 2001), and group mindfulness training (Hesslinger et al., 2002; Philipsen et al., 2007; Zylowska et al., 2008). Unlike medication, psychosocial interventions provide adults with skills to overcome some of the primary functional impairments of ADHD. Overall, results have suggested that psychosocial interventions for emerging and mature adults with ADHD are effective in ameliorating core symptoms and functional impairment.

The program developed by Safren and colleagues has published findings suggesting that their group intervention is efficacious in ameliorating core symptoms of ADHD among mixed groups of emerging and mature adults, with treatment gains being maintained after a 1-year follow-up period (Safren et al., 2010). The treatment model consists of 12 weekly, 1-hour, individual sessions that include psychoeducation, teaching and practicing skills/strategies (e.g., coping, organization, reducing distractibility), and cognitive restructuring or adaptive thinking (Safren, Perlman, Sprich, & Otto, 2005).

Safren, Otto, and colleagues (2005) conducted a study to examine the efficacy of their group treatment in a sample of 31 mature adults with ADHD ranging in age from 25 to 59 ($M = 45.5$). At the time of the study all participants were on a stable medication regimen but continued to experience significant residual symptoms. The participants were randomly assigned to one of two conditions: continued medication with individual CBT or continued medication

alone. Those who received CBT showed significantly lower self-reported ratings of ADHD ($d = 1.7$) and more improvement from a masked evaluator's ratings of ADHD ($d = 1.2$ – 1.4), depression ($d = .39$ – $.65$), and anxiety ($d = .43$ – $.55$) than those assigned continued psychopharmacology alone. Safren et al. (2010) completed a subsequent randomized controlled trial where adults (age $M = 43.2$) with ADHD on a stable medication ($N = 86$) were randomly assigned to receive either CBT or relaxation training in conjunction with continuing their medication. Those who received CBT were reported to have more significant improvements ($d = .53$ – $.60$) relative to those assigned to the relaxation condition. There were also a greater proportion of participants in the CBT group who responded to treatment (53–67% vs. 23–33%).

For many emerging adults with ADHD, impairment in three domains of functioning that are particularly relevant to the college environment—organization, time management, and planning—often persist into mature adulthood. These areas of difficulty are associated with greater risk of unemployment, financial difficulties, depression, anxiety, relationship difficulties, and poor life satisfaction (Biederman, Faraone, Spencer, Mick, Monteaux, & Aleari, 2006). From this, it has been hypothesized that treatment approaches targeting the skills that seem relevant to academic, occupational, social, and psychological functioning could be crucial in improving short- and long-term functioning in college students with ADHD (Fleming & McMahon, 2012; Green & Rabiner, 2012). Thus, there is a need for trials targeting functional impairment with college students to evaluate the efficacy of such interventions.

The current study's multimodal group- and individual-treatment design evolved in response to the unique clinical needs of college students with ADHD. We reasoned that while an individual treatment modality has the benefit of allowing the intervention to be tailored to a client's unique needs, the inclusion of a group-based component seemed particularly advantageous for college students. In addition to a group affording the opportunity for vicarious support, encouragement, reinforcement, and modeling of positive behavior change, research has suggested that contact with other individuals with ADHD may reduce client's stigma towards ADHD (Chew, Jensen, & Rosén, 2009). We also believed the inclusion of a group component would be particularly beneficial for college students, as they are likely to share the same work (i.e., academic) responsibilities and experiences. Lastly, although Safren, Perlman, and colleagues' (2005) intervention was designed to be implemented in 12 weekly modules, it was considered beneficial to condense the treatment to be delivered in an academic semester.

The aim of the current study was to provide a preliminary evaluation of an adapted version of the

Safren, Perlman, and colleagues' (2005) intervention in the context of a combined individual and group treatment program with a sample of college students reporting a prior diagnosis of ADHD. The primary dependent measures were self-report ratings of functional impairment across several domains of functioning (i.e., occupational, academic, daily living skills, and self-esteem), as well as inattention and hyperactivity/impulsivity symptomology. We hypothesized that college students who completed the intervention would demonstrate significant improvements from pre- to postmeasurement of inattention/hyperactivity symptoms and four domains of functional impairment.

Method

Participants

Participants in this study were undergraduate and graduate students from a public midwestern university with a predominately Caucasian student population of approximately 10,100 undergraduate and 3,500 graduate students. Participant recruitment occurred through flyers e-mailed to several campus organizations (e.g., University Disability Support Services, Student Health Services, Athletics Department, University Counseling Center, and the Psychology Clinic). The flyers stated that students with ADD or ADHD were eligible to participate in training to acquire new organizational and time-management skills.

Of the 19 students who participated in the intervention program, 13 completed postintervention measures (completers) and 6 did not (noncompleters). Participants with comorbid mood disorders ($n = 3$), anxiety ($n = 1$), and learning disorders ($n = 1$) were included in the analyses. However, participants with comorbid substance dependence ($n = 1$) or psychotic disorders ($n = 1$) were excluded from the analyses. Specifically, one participant met criteria for cannabis dependence. The other participant developed psychotic symptoms and withdrew from the university. After excluding these two participants, data from 12 completers and 5 noncompleters were analyzed.

The final sample ($N = 17$) consisted of 6 men and 11 women. Participants ranged in age from 18 to 38 ($M = 25.41$, $SD = 5.26$). These students were comprised of one freshman, three sophomores, three juniors, four seniors, five graduate students, and one undergraduate student earning a second Bachelor's degree. Participants were not asked to document their diagnosis or ADHD subtype; however, based on self-report ADHD rating scales at baseline, it was speculated that 11 participants had ADHD-Inattentive Type, 1 had ADHD-Hyperactive Type, and 5 had ADHD-Combined Type. Of the 17 participants, 13 reported taking psychotropic medications at the start of the treatment. Of the 13 who were taking medications, 11 were taking stimulants (e.g., Methylphenidate), one was taking a selective serotonin reuptake inhibitor (SSRI), and one was taking a sleep medication. As recommended by Safren, Pearlman, et al.

(2005), clients were asked to keep their medication regimen consistent over the course of treatment. Medication status at the end of the intervention was not formally assessed. On average, completers attended 83% of individual sessions and 77% of group session whereas noncompleters attended 44% of individual and 42% of group sessions.

Measures

Barkley Current Symptoms Scale – Self-Report Form (CSS-SR)

The CSS-SR (Barkley & Murphy, 2006) is a self-report measure which assesses for ADHD in individuals over 12 years of age. The scale consists of 18 items that reflect the criteria needed for a diagnosis of ADHD in the *DSM-IV-TR* (APA, 2000). All 18 items are rated using a 4-point Likert scale ranging from 0 = "Never or rarely" to 3 = "Very often." According to Barkley and Murphy, the internal consistency of the inattention section of the CSS-SR is .86, while the hyperactivity/impulsivity section is .84. Similarly, Fedele, Lefler, Hartung, and Canu (2012) demonstrated strong internal consistencies for both inattention ($\alpha = .84$) and hyperactivity/impulsivity ($\alpha = .86$) in a large sample of college students.

In this study data were aggregated into symptom counts to determine inattention and hyperactivity/impulsivity scores. Specifically, if the item was endorsed as occurring "often" or "very often," then it was considered present. Using this procedure, symptoms were counted for each participant. Possible scores ranged from 0 to 9 for each subscale.

Weiss Functional Impairment Rating Scale (WFIRS)

The WFIRS (Weiss, 2000) is a self-report measure to examine ADHD impairment on functioning. The scale consists of 70 items that are divided into seven domains: Family (e.g., problems losing control with family, causing fighting in the family), Work (e.g., problems performing required duties, getting fired from job), School (e.g., problems completing assignments, problems with inconsistent grades), Life Skills (e.g., problems managing money, problems keeping up with household chores), Self-Concept (e.g., feeling bad about yourself, feeling incompetent), Social (e.g., problems keeping friends, problems having fun with other people), and Risk (e.g., doing things that are illegal, being involved with the police). Participants completed the scale by rating their endorsement of each item using a 4-point Likert scale ranging from 0 = "Never or Not at All" to 3 = "Very Often or Very Much." In addition, participants had the option of not choosing one of the Likert choices and instead checking a box marked "Not Applicable." According to Hartung, Canu, Lefler, et al. (2013), the WFIRS demonstrated strong internal consistency ranging from .86 to .94 across subscales in a sample of college students. College students with ADHD seeking services from the university's psychology clinic predominantly presented with impairment

related to their academics, occupational, psychological well-being, and self-efficacy. Thus, in the present study we limited the primary outcome measures of impairment to the Work, School, Life Skills, and Self-Concept subscales.

For the purpose of this study, data from each subscale were aggregated into mean subscale scores for each participant. Means were used rather than total scores since subscales varied in the number of symptoms on each scale. The use of means in our analyses allowed comparisons across subscales. Possible scores ranged from 0 to 3 for each subscale.

Intervention Program

The treatment was a condensed adaptation of the treatment protocol developed by [Safren, Perlman, Sprich, and Otto \(2005\)](#) as a goal-oriented intervention designed to help adults cope with ADHD. The program is designed to be completed in 12 individual sessions. The 12 sessions are divided into four modules: Psychoeducation, Organization, and Planning; Reducing Distractibility; Adaptive Thinking; and Additional Skills (i.e., Relapse Prevention).

Module 1: Psychoeducation, Organization, and Planning

This module consists of sessions 1 to 5. Over the course of the first five sessions, skills to increase planning and organization are introduced. Tasks such as preparing and effectively using a calendar and task list are discussed and demonstrated. In addition, participants are taught how to manage complex tasks by breaking the task down into smaller parts.

Module 2: Reducing Distractibility

This module consists of sessions 6 and 7. Over the course of two sessions participants are taught how to utilize their attention span to the best of their ability. This is accomplished by teaching participants to gauge the length of their attention span and to break down any large task into smaller tasks that correspond to the length of their attention span. Also discussed in this module are the use of timers and other reminders.

Module 3: Adaptive Thinking

This module consists of sessions 8 to 10. The main goal of these three sessions is to help participants better understand the relationship between thoughts, feelings and behaviors. Specifically, participants are taught to (a) recognize when they are engaging in negative thoughts and (b) how to correct those thoughts. This module utilizes several different homework items, such as thought records, positive self-coaching and learning how to make rational choices.

Module 4: Additional Skills

This module consists of sessions 11 and 12. This module is not considered a “core” module according to [Safren,](#)

[Otto, et al. \(2005\)](#), [Safren, Perlman, et al. \(2005\)](#); however, the techniques offered in these two sessions are still important. Session 11 deals primarily with the importance of avoiding procrastination. Throughout this session participants are taught how to identify procrastination tendencies, as well as techniques that are useful for reducing procrastination. Following this, Session 12 is used as a way to tie all the knowledge from the prior 11 sessions together in a way that the participant finds useful, in order to decrease the likelihood of relapse.

Procedure

These current procedures were developed as a treatment program. Clients provided informed consent to participate in treatment. At a later date, we received approval from the University Institutional Review Board to analyze these archival data anonymously. All participants were asked to read and sign an informed consent form that outlined the treatment program, as well as any possible benefits or risks, prior to the start of the program. Further, participants completed pre-test measures, which consisted of the CSS-SR and the WFIRS.

Following the pre-test, participants were invited to attend a total of 20 one-hour-long training sessions, over the course of 10 weeks. Participants attended weekly group sessions led by clinical psychology faculty members and graduate students. In addition, participants attended weekly individual sessions led by clinical psychology graduate students. The content in the individual sessions typically mirrored that of the group sessions (see [Table 1](#)) and involved the therapist reviewing the prior week’s homework with their client.

Although the [Safren, Perlman, and colleagues' \(2005\)](#) treatment model does not include group sessions, it was decided to supplement the individual sessions with group sessions for this program. There were several reasons for the addition of group sessions. First, the group sessions allowed participants to receive support from other college students who have had similar experiences with ADHD. Second, the addition of group sessions allowed us to cover 12 weeks of material in 10 weeks. In our experience, the 10-week time-frame has been found to be ideal for implementation during a university semester. It allows a few weeks to recruit students and advertise the program at the beginning of the semester and it enables us to complete the program before finals week. Finally, by offering one group and one individual session per week, participants who missed one of the two sessions were still exposed to the material. Given that completers attended 83% of individual sessions and 77% of group sessions, the addition of group sessions each week increased the likelihood that participants were exposed to a greater proportion of the material.

At the end of the 10-week program participants completed post-test measures which again consisted of the

Table 1
Weekly Schedule of Topics Covered

Week	Topic of Group Session	Topic of Individual Session
1	Psychoeducation, organization and planning (Session #1)	Psychoeducation, organization, and planning (Session #1)*
2	Education about medications for ADHD	Involvement of a family member or significant other (Session #2)
3	Prioritizing tasks (Session #3)	Prioritizing tasks (Session #3)*
4	Managing overwhelming tasks (Session #4)	Organizing papers (Session #5)
5	Gauging attention span and distractibility delay (Session #6)	Gauging attention span and distractibility delay (Session #6)*
6	Modifying the environment (Session #7)	Modifying the environment (Session #7)*
7	Introduction to a cognitive model of ADHD (Session #8)	Cognitive model of ADHD (Session #8)*
8	Adaptive thinking (Session #9)	Rehearsal & Review of adaptive thinking skills (Session #10)
9	Procrastination (Session #11)	Procrastination (Session #11)*
10	Relapse prevention (Session #12)	Relapse prevention (Session #12)*

Note. All sessions refer to the treatment protocol developed by Safren, Otto, et al. (2005), Safren, Perlman, et al. (2005).

* The individual session was spent discussing the practical applications of the material that was taught during the group session for that week.

CSS-SR and the WFIRS. Participants completed these measures during their final individual session.

Case Example

To illustrate the potential benefits of a combined group and individual approach for college students with ADHD, a case example of an actual client from the study is presented with identifying details changed to protect confidentiality.

“Hailey” is a 29-year-old part-time student majoring in art. At the time of treatment, she was working toward her second bachelor’s degree. When entering the program, she had concerns about using her time productively, managing her finances effectively, and having low self-esteem. She reported a tendency to become engrossed in more enjoyable tasks and hobbies, such as watching television, and not beginning her homework until the evening. She indicated that she has difficulty prioritizing tasks and delaying gratification (e.g., waiting to watch television until after she has finished her homework).

Background/History

Hailey was diagnosed with ADHD by a psychiatrist in her home state approximately 7 years prior to treatment (at age 22). Since that time, she has taken stimulant medications to manage her ADHD symptoms. Specifically, she took Adderall XR for several years and then switched to Vyvanse around the time she started this treatment program. Prior to participating in this program, she had not received any psychosocial treatments, nor was she aware that psychosocial treatments for ADHD are available. Hailey reported a difficult and unstable childhood. Her parents divorced when she was 10 years old. Prior to the divorce, she lived with both parents. After her parents divorced, she lived with her father for several years and then with an aunt in another state. Hailey has one full sibling and three half-siblings. She reported a family history of ADHD, substance abuse, and

mood and anxiety disorders. In addition, she reported a personal history of alcohol abuse for which she received treatment in her late teens. As a result of negative personal and family experiences with alcohol, Hailey reported that she no longer uses alcohol.

Primary Presenting Concerns

Hailey was late to most individual therapy sessions and indicated that lateness is a chronic problem for her. She was also late to some of the group sessions and was sometimes a bit disruptive when she did arrive. Hailey also demonstrated impulsivity, which was evidenced by a tendency to talk loudly during group sessions, blurt out responses, and interrupt others during group discussions. During individual therapy, Hailey had difficulty staying on task, as evidenced by her tendency to become tangential in her speech. In one individual session, the therapist helped Hailey develop a plan for completing a longer-term project for one of her classes. Hailey reported that this was the most involved project that she had ever been assigned, and she expressed doubt as to her ability to complete the task.

Response to Treatment

Hailey’s therapist noted that punctuality was a problem that interfered with therapy; thus, Hailey and the therapist problem-solved and came up with an idea of setting alarms on her phone to notify her that she needed to get ready for her next scheduled appointment. The therapist and Hailey also collaborated to address her difficulties in planning for long-term projects, which involved breaking down tasks to make them less aversive and more manageable. They focused on dismantling tasks into the smallest possible action one could take so that each step in the process was absolutely manageable (e.g., look through syllabus and note the topics that will be covered on the next exam). To address the client’s initial reticence toward breaking down large assignments, the

therapist engaged in cognitive restructuring of automatic thoughts related to procrastination (e.g., “I will make up the time I was supposed to be studying tomorrow”). To further assist the client in meeting her goals regarding these tasks (e.g., spending 30 minutes each day studying for the final exam with no distractions), they used time in session to develop organization and planning strategies, which included setting up a to-do list application on her smart phone and entering due-dates into her calendar.

During group sessions, which were scheduled between individual sessions, Hailey reviewed the goals she set for herself in her last individual therapy session as a means to create accountability and support from the other group members. During one of the later individual sessions, Hailey related that she was very positive about the benefits of the program. She enjoyed the support she received from other participants during the group sessions. Hailey also related that the individual sessions were beneficial because she was held accountable for what she had set out to accomplish in the previous week.

The case example highlights how a client’s therapeutic outcome may be enhanced by using a multimodal approach to treatment. For instance, the standard individual CBT approach appeared beneficial in that it allowed the clinician to tailor the treatment in order to more intensely target a skill for which Hailey had a difficult time acquiring (i.e., managing long-term projects). However, without the inclusion of the group modality, it is likely that the clinician may not have been made aware of Hailey’s social impulsivity and possible relationship problems. The group’s peer support during the treatment also appeared to provide a personal benefit to her.

Results

Analytic Plan

Differences in the demographic and baseline clinical characteristics of completers ($n = 12$) and noncompleters ($n = 5$) were examined using independent-samples t -tests and chi-square analyses as appropriate. Individual change across primary outcome measures from baseline to posttreatment was assessed via dependent-samples t -tests. Evaluation of completers was augmented through an intent-to-treat (ITT) analysis in which baseline scores were carried forward for individuals with incomplete data ($N = 17$). Although limitations of last-observation-carried-forward methods are well known (e.g., Carpenter, Kenward, Evans, & White, 2004), the small sample in this open trial and the likely failure of attrition to meet standards for random missingness (Rubin, 1976) precluded reasonable use of more sophisticated methods (e.g., multiple imputation, maximum likelihood methods). Effect sizes for all comparisons are given as Cohen’s d and calculated using estimates of standard deviation at baseline. Confidence intervals for effect sizes were computed based on recommendations from Howell (2011) and Cummings and Finch (2001).

Baseline Comparisons

Analyses of completer and noncompleter groups indicated no reliable difference in participant gender ($p = .605$). Mean comparisons also failed to evidence differences in age, inattention, hyperactivity/impulsivity, or impairment in work or life skills domains ($p \geq .332$). Noncompleters did evidence greater impairment within

Table 2
Inattention and Hyperactivity Symptom Counts for Completers and Noncompleters

<i>Completer Analysis (N = 12)</i>											
	Pre-Treatment		Post-Treatment		Difference			Paired samples t -tests			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	95% CI	<i>p</i>	Cohen’s <i>d</i>	95% CI	
Inattention	5.75	2.34	3.58	2.78	2.17	3.33	[0.29, 4.05]	.045	0.93	[0.00, 1.68]	
Hyperactivity	3.67	1.92	2.17	2.79	1.50	3.26	[-0.34, 3.34]	.139	0.78	[-0.36, 1.27]	

<i>Intent-to-Treat Analysis (N = 17)</i>											
	Pre-Treatment		Post-Treatment		Difference			Paired samples t -tests			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	95% CI	<i>p</i>	Cohen’s <i>d</i>	95% CI	
Inattention	6.12	2.34	4.59	3.04	1.53	2.93	[0.13, 2.93]	.048	0.65	[-0.13, 1.25]	
Hyperactivity	3.41	1.80	2.35	2.45	1.06	2.79	[-0.27, 2.39]	.138	0.59	[-0.20, 1.17]	

Note. p -values are 2-tailed; Cohen’s d was calculated using the baseline SD .

Table 3
Impairment Subscale Scores for Completers

	Pre-Treatment		Post-Treatment		Difference			Paired samples <i>t</i> -tests		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	95% CI	<i>p</i>	Cohen's <i>d</i>	95% CI
School	2.14	0.43	1.92	0.41	0.22	0.34	[0.03, 0.42]	.047	0.51	[-0.29, 1.33]
Work	1.75	0.46	1.46	0.55	0.29	0.41	[0.06, 0.52]	.033	0.63	[-0.26, 1.38]
Self-concept	2.13	0.83	1.77	0.82	0.37	0.83	[-0.10, 0.84]	.154	0.44	[-0.38, 1.25]
Life skills	2.27	0.49	2.04	0.54	0.23	0.67	[-0.15, 0.61]	.263	0.47	[-0.37, 1.25]

Note. *p*-values are 2-tailed; Cohen's *d* was calculated using the baseline *SD*.

the domain of self-concept ($p = .043$, $g_u = 1.12$).¹ In addition, noncompleters reported marginally significantly greater impairment with school ($p = .083$). Finally, as expected, noncompleters attended significantly fewer sessions ($M = 8.60$, $SD = 3.29$) than completers ($M = 16.00$, $SD = 2.59$; $p < .001$).

ADHD Symptoms

Paired samples *t*-tests were conducted to compare pre- and postinterventions scores for self-reported inattention and hyperactivity/impulsivity in completers. The results are shown in Table 2. On average, at pretreatment, completers reported levels of inattention that approached the DSM-IV cutoff of 6 symptoms and exceeded the DSM-5 (APA, 2013) cutoff of 5 symptoms ($M = 5.75$). With regard to hyperactivity/impulsivity, completers reported subthreshold levels of symptoms ($M = 3.67$). The *t*-test for change in inattention symptoms was statistically significant with a large effect size ($p = .045$; $d = 0.94$). Change in symptoms of hyperactivity/impulsivity also approached standards for a large effect, although tests failed to meet threshold for statistical significance in this sample ($p = .139$; $d = .78$). ITT analysis with pretreatment scores carried forward resulted in a moderate attenuation of effects but no difference in the pattern of statistical significance (see Table 2).

Impairment Scores

Paired samples *t*-tests also were used to evaluate change in impairment scales (see Table 3). Analysis of School ($p = .047$; $d = .51$) and Work ($p = .033$; $d = .63$) domains indicated statistically significant improvement consistent with medium effects. Impairment in Self-Concept and Life Skills subscales evidenced small effects ($d = .44 - .47$) but did not reach threshold for statistical significance. An identical pattern of results were noted using more conservative ITT analysis with pre-treatment scores carried forward.²

¹ Effect sizes for between-group differences were calculated using Hedges's unbiased *g* (Hedges, 1982).

² Actual figures may be requested from the corresponding author.

Discussion

The present investigation aimed to evaluate the potential effects of an adapted combined individual and group CBT intervention for college students with a prior diagnosis of ADHD. At baseline, all participants reported receiving a prior diagnosis of ADHD and, on average, endorsed clinically significant levels of inattention ($M = 5.75$). However, following the completion of the program, there was a large effect on self-report ratings of inattention. In fact, the participants' average reports of inattention reduced to subthreshold levels ($M = 3.58$) following the completion of the program. Program completion was also associated with significant improvement in school and work functioning with medium effect sizes. Although change in hyperactivity/impulsivity and other domains of functioning (i.e., Self-Concept and Life Skills) failed to meet threshold for significance in this small pilot study, estimates of effect size suggest plausible gains in these areas. Overall, the study suggests the adaptation of Safren, Perlman, and colleagues' (2005) treatment to a combined individual and group approach for ADHD among college students is promising for improving functioning in school and work and for ameliorating inattention symptoms.

As previously mentioned, the current study failed to detect significant improvements across several of the primary outcome variables. Participants' change in ratings of hyperactivity/impulsivity fell above the predetermined threshold for significance ($p = .139$). Given the medium effect size ($d = 0.78$) and the size of the sample ($n = 12$), it is possible that the current study was unable to detect a significant change due to the size of the sample. In addition to nonsignificant reductions in ratings of hyperactivity/impulsivity following the completion of the program, the current investigation failed to detect significant improvements across some domains of life functioning. Given this, future treatment studies should evaluate the efficacy of incorporating approaches aimed to ameliorate these other areas of functioning—such as daily living skills and self-esteem.

Limitations and Future Directions

Although the results of this study—which represents the first test of this combined individual and group CBT

program for college students with ADHD—are encouraging, there are a number of limitations to this small-scale study. First, the study only examined treatment outcomes in terms of pre- and posttreatment differences. Future studies should investigate the maintenance of gains by including a follow-up period. Second, the small sample size emphasizes the need for replication of the findings. Third, the present study was an open trial and there was no control group. Therefore, confounds such as regression to the mean and therapist attention were not accounted for, and future investigations should compare this treatment to a plausible control condition. Fourth, enrollment in the treatment program was contingent on the student's report of receiving a prior diagnosis of ADHD. Thus, there are issues with internal validity that would otherwise have been controlled for by assessing all participants for ADHD as part of the study. Lastly, generalizability is limited to college students who are aware of their difficulties and self-refer to receive treatment.

Despite these limitations, this adapted multimodal intervention appears to have promise for improving the inattention symptoms and school and work functioning of college students with ADHD. Generally, the treatment had positive effects on ADHD symptoms and life functioning. In future studies, it will be important to elucidate the "active ingredients" of this multicomponent intervention by means of dismantling studies to better understand whether individual components are most efficacious and efficient. It is also encouraged that future investigations use research designs that allow for investigators to assess whether a combined group and individual format is superior to either one alone. Additional studies are necessary to answer questions about moderators and mediators of treatment response. That is, it may be that the primary mechanism of change is the use of a particular skill (e.g., using a planner). Further, this treatment may work well for some college students, but less well for others. For example, when baseline measures were compared between completers and noncompleters, those who did not complete treatment were found to have significantly higher self-report ratings of self-esteem problems and risk-taking behaviors. Therefore, these individuals may respond less well to this adapted treatment model, as they may require more intensive CBT to address their internalizing and behavioral problems. Although there is much work to be done in enhancing the quality and dissemination of effective treatments for this population, this study contributes to the burgeoning evidence on treatments for ADHD among college students and suggests that a combined individual and group cognitive-behavioral skills training approach can have clinically significant effects for college students with this chronic and impairing disorder.

References

- Allsopp, D. H., Minskoff, E. H., & Bolt, L. (2005). Individualized course-specific strategy instruction for college students with learning disabilities and ADHD: Lessons learned from a model demonstration project. *Learning Disabilities Research & Practice, 20*, 103–118, <http://dx.doi.org/10.1111/j.1540-5826.2005.00126.x>
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders*, 4th ed., text rev. Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*, 5th ed. Washington, DC: Author.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*, 469–480, <http://dx.doi.org/10.1037/0003-066X.55.5.469>
- Barkley, R. A., & Murphy, K. R. (2006). *Attention-Deficit Hyperactivity Disorder: A Clinical Workbook*, 3rd ed. New York, NY: Guilford Press.
- Barkley, R. A., Murphy, K. R., & Fischer, M. (2008). *ADHD in adults: What the science says*. New York: Guilford.
- Baverstock, A. C., & Finlay, F. F. (2003). Who manages the care of students with attention deficit hyperactivity disorder (ADHD) in higher education? *Child: Care, Health and Development, 29*(3), 163–166, <http://dx.doi.org/10.1046/j.1365-2214.2003.00327.x>
- Biederman, J., Faraone, S. V., Spencer, T. J., Mick, E., Monuteaux, M. C., & Alcardi, M. (2006). Functional impairments in adults with self-reports of diagnosed ADHD: A controlled study of 1001 adults in the community. *Journal of Clinical Psychiatry, 67*, 524–540, <http://dx.doi.org/10.4088/JCP.v67n0403>
- Carpenter, J., Kenward, M., Evans, S., White, I. (2004). Last observation carry-forward and last observation analysis. *Statistics in Medicine, 23*, 3241–3244. *cognitive-behavioral treatment program*. New York, NY: Oxford University Press.
- Chew, B. L., Jensen, S. A., & Rosén, L. A. (2009). College students' attitudes toward their ADHD peers. *Journal Of Attention Disorders, 13*(3), 271–276, <http://dx.doi.org/10.1177/1087054709333347>
- 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*, 532–574.
- Dulcan, M. K., & Benson, R. S. (1997). Summary of the practice parameters for the assessment of children, adolescents, and adults with ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*, 1311–1317, <http://dx.doi.org/10.1097/00004583-199709000-00033>
- 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*, 234–250, <http://dx.doi.org/10.1177/1087054709340650>
- Fedele, D. A., Lefler, E. K., Hartung, C. M., & Canu, W. H. (2012). Sex differences in the manifestation of ADHD in emerging adults. *Journal of Attention Disorders, 16*, 109–117, <http://dx.doi.org/10.1177/1087054710374596>
- Fleming, A. P., & McMahon, R. J. (2012). Developmental context and treatment principles for ADHD among college students. *Clinical Child and Family Psychology Review, 15*, 303–329, <http://dx.doi.org/10.1007/s10567-012-0121-z>
- Frazier, T. W., Youngstrom, E. A., Glutting, J. J., & Watkins, M. W. (2007). ADHD and achievement: Meta-analysis of the child, adolescent, and adult literatures and a concomitant study with college students. *Journal of Learning Disabilities, 40*, 49–65, <http://dx.doi.org/10.1177/00222194070400010401>
- Green, A. L., & Rabiner, D. L. (2012). What do we really know about ADHD in college students? *Neurotherapeutics, 9*, 559–568, <http://dx.doi.org/10.1007/s13311-012-0127-8>
- Hartung, C. M., Canu, W. H., Cleveland, C. S., Lefler, E. K., Mignogna, M. J., Fedele, D. A., ...Clapp, J. D. (2013). Stimulant medication use in college students: Comparison of appropriate users, misusers, and nonusers. *Psychology of Addictive Behaviors, 27*, 832–840, <http://dx.doi.org/10.1037/a0033822>
- Hartung, C. M., Canu, W. H., Lefler, E. K., Jaconis, M., LaCount, P. A., & Richardson, K. (2013). *ADHD-related impairment in emerging adults: Psychometric properties and clinical applications*. Presented at the 16th meeting of the International Society for Research Child and Adolescent Psychopathology, Leuven, Belgium.

- Hedges, L. V. (1982). Fitting categorical models to effect sizes from a series of experiments. *Journal of Educational Statistics*, 7, 119–37, <http://dx.doi.org/10.2307/1164961>
- Heiligenstein, E., Guenther, G., Levy, A., Savino, F., & Fulwiler, J. (1999). Psychological and academic functioning in college students with attention deficit hyperactivity disorder. *Journal of American College Health*, 47, 181–185, <http://dx.doi.org/10.1080/07448489909595644>
- Hesslinger, B., Tebartz van Elst, L., Nyberg, E., Dykier, P., Richter, H., Berner, M., & Evert, D. (2002). Psychotherapy of attention deficit hyperactivity disorder in adults: A pilot study using a structured skills training program. *European Archives of Psychiatry and Clinical Neuroscience*, 252, 177–184.
- Howell, D. C. (2011). Confidence intervals on effect size. Retrieved August 18, 2012, from <http://www.uvm.edu/~dhowell/methods8/Supplements/Confidence%20Intervals%20on%20Effect%20Size.pdf>
- Knouse, L. E., Cooper-Vince, C., Sprich, S., & Safren, S. A. (2008). Recent developments in the psychosocial treatment of adult ADHD. *Expert Review of Neurotherapeutics*, 8, 1537–1548, <http://dx.doi.org/10.1586/14737175.8.10.1537>
- Kubik, J. A. (2010). Efficacy of ADHD coaching for adults with ADHD. *Journal of Attention Disorders*, 13, 442–453, <http://dx.doi.org/10.1177/1087054708329960>
- Mick, E., Faraone, S. V., Biederman, J., & Spencer, T. J. (2004). The course and outcome of attention-deficit/hyperactivity disorder. *Primary Psychiatry*, 11, 42–48.
- Norwalk, K., Norvilitis, J. M., & MacLean, M. G. (2009). ADHD symptomatology and adjustment to college in China and the United States. *Journal of Learning Disabilities*, 13, 86–94, <http://dx.doi.org/10.1177/1087054708320441>
- Philipsen, A., Richter, H., Peters, J., Alm, B., Sobanski, E., Colla, M., ... Hesslinger, B. (2007). Structured group psychotherapy in adults with attention deficit hyperactivity disorder: Results of an open multicenter study. *The Journal of Nervous and Mental Disease*, 195, 1013–1019, <http://dx.doi.org/10.1097/NMD.0b013e31815c088b>
- Prince, J. B. (2006). Pharmacotherapy of attention-deficit/hyperactivity disorder in children and adolescents: Update on new stimulant preparations, atomoxetine, and novel treatments. *Child and Adolescent Psychiatric Clinics of North America*, 15, 13–50, <http://dx.doi.org/10.1016/j.chc.2005.08.002>
- Quinn, P. O. (2001). *ADD and the college student: A guide for high school and college students with attention deficit disorder*, Rev. ed. Washington, DC: Magination Press.
- Rostain, A. L., & Ramsay, J. R. (2006). A combined treatment approach for adults with ADHD—results of an open study of 43 patients. *Journal of Attention Disorders*, 10, 150–159, <http://dx.doi.org/10.1177/1087054706288110>
- Rubin, D. B. (1976). Inference and missing data. *Biometrika*, 63, 581–592.
- Safren, S. A., Otto, M. W., Sprich, S., Winett, C. L., Wilens, T. E., & Biederman, J. (2005). Cognitive-behavioral therapy for ADHD in medication-treated adults with continued symptoms. *Behavior Research and Therapy*, 43, 831–842, <http://dx.doi.org/10.1016/j.brat.2004.07.001>
- Safren, S. A., Perlman, C. A., Sprich, S., & Otto, M. W. (2005). *Mastering your adult ADHD: A cognitive-behavioral treatment program—Therapist guide*. Oxford, UK: Oxford University Press.
- Safren, S. A., Sprich, S. E., Mimiaga, M. J., Surman, C., Knouse, L., Groves, M., & Otto, M. W. (2010). Cognitive behavioral therapy vs relaxation with educational support for medication-treated adults with ADHD and persistent symptoms: A randomized control trial. *Journal of the American Medical Association*, 304, 875–880, <http://dx.doi.org/10.1001/jama.2010.1192>
- Salakari, A., Virta, M., Gronroos, N., Chydenius, E., Partinen, M., Vataja, R., ...Iivanainen, M. (2010). Cognitive-behaviorally-oriented group rehabilitation of adults with ADHD: Results of a 6-month follow-up. *Journal of Attention Disorders*, 13, 516–523, <http://dx.doi.org/10.1177/1087054709332069>
- Schulenberg, J. E., Sameroff, A. J., & Cicchetti, D. (2004). The transition to adulthood as a critical juncture in the course of psychopathology and mental health. *Development and Psychopathology*, 16, 799–806, <http://dx.doi.org/10.1017/S0954579404040015>
- Shaw-Zirt, B., Popali-Lehane, L., Chaplin, W., & Bergman, A. (2005). Adjustment, social skills, and self-esteem in college students with symptoms of ADHD. *Journal of Attention Disorders*, 8, 109–120, <http://dx.doi.org/10.1177/1087054705277775>
- Shiffrin, J. G., Proctor, B. E., & Prevatt, F. F. (2010). Work performance differences between college student with and without ADHD. *Journal of Attention Disorders*, 13, 489–496, <http://dx.doi.org/10.1177/1087054709332376>
- Solanto, M. V., Marks, D. J., Mitchell, K. J., Wasserstein, J., & Kofman, M. D. (2008). Development of a new psychosocial treatment for adult ADHD. *Journal of Attention Disorders*, 11, 728–736, <http://dx.doi.org/10.1177/1087054707305100>
- Solanto, M. V., Marks, D. J., Wasserstein, J., Mitchell, K., Abikoff, H., Alvir, J. J., & Kofman, M. D. (2010). Efficacy of meta-cognitive therapy for adult ADHD. *The American Journal of Psychiatry*, 167, 958–968, <http://dx.doi.org/10.1176/appi.ajp.2009.09081123>
- Spencer, T., Biederman, J., Wilens, T. E., & Faraone, S. E. (1998). Adults with attention-deficit/hyperactivity disorder: A controversial diagnosis. *The Journal of Clinical Psychiatry*, 59, 59–68.
- Stevenson, C. S., Whitmont, S., Bornholt, L., Livesey, D., & Stevenson, R. J. (2002). A cognitive remediation programme for adults with attention deficit hyperactivity disorder. *The Australian and New Zealand Journal of Psychiatry*, 36, 610–616, <http://dx.doi.org/10.1046/j.1440-1614.2002.01052.x>
- 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, 647–656, <http://dx.doi.org/10.1002/pits.20101>
- Virta, M., Salakari, A., Antila, M., Chydenius, E., Partinen, M., Kaski, M., ...Iivanainen, M. (2010). Short cognitive behavioral therapy and cognitive training for adults with ADHD: A randomized controlled study. *Neuropsychiatric Disease and Treatment*, 6, 44–453.
- Virta, M., Vedenpaa, A., Gronroos, N., Chydenius, E., Partinen, M., Vataja, R., ...Iivanainen, M. (2008). Adults with ADHD benefit from cognitive-behaviorally oriented group rehabilitation: A study of 29 participants. *Journal of Attention Disorders*, 12, 218–226, <http://dx.doi.org/10.1177/1087054707311657>
- Weiss, G., & Hechtman, L. (1993).
- Weiss, M. D. (2000). *Weiss Functional Impairment Rating Scale (WFIRS) Instructions*. Vancouver, BC: University of British Columbia.
- Wiggins, D., Singh, K., Getz, H. G., & Hutchins, D. E. (1999). Effects of brief group intervention for adults with attention deficit/hyperactivity disorder. *Journal of Mental Health Counseling*, 21, 82–92.
- Wilens, T. E., Biederman, J., & Spencer, T. J. (1998). Pharmacotherapy of attention deficit hyperactivity disorder in adults. *CNS Drugs*, 9, 347–356.
- Wilens, T. E., Biederman, J., & Spencer, T. J. (2002). Attention deficit/hyperactivity disorder across the lifespan. *Annual Review of Medicine*, 53, 113–131, <http://dx.doi.org/10.1146/annurev.med.53.082901.103945>
- Zwart, L. M., & Kallemeyn, L. M. (2001). Peer-based coaching for college students with ADHD and learning disabilities. *Journal of Postsecondary Education and Disability*, 15, 1–15.
- Zylowska, L., Ackerman, D. L., Yang, M. H., Futrell, J. L., Horton, N. L., Hale, T. S., ...Smalley, S. L. (2008). Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. *Journal of Attention Disorders*, 11, 737–746, <http://dx.doi.org/10.1177/1087054707308502>

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