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The Effects of a Brief Organization, Time Management, and Planning Intervention for At-Risk College Freshmen

Anne E. Stevens [a], Cynthia M. Hartung[a], Christopher R. Shelton[a], Patrick A. LaCount [a], and April Heaney[b]

[a]Department of Psychology, University of Wyoming, Laramie, Wyoming, USA; [b]Learning Resource Network, University of Wyoming, Laramie, Wyoming, USA

ABSTRACT

College freshmen who are at greater risk to fail or drop out before attaining a bachelor's degree are at a distinct disadvantage occupationally, economically, and socially. *At-risk* students (those who are academically underprepared) are six times more likely to drop out during the first year of college. This study sought to examine the effects of an organization, time management, and planning (OTMP) skills intervention with at-risk freshmen. Freshmen conditionally accepted at a public four-year university and enrolled in a first-year seminar intended to enhance academic success and retention participated in the study. Students completed online surveys regarding impairment, OTMP skill use, inattention symptoms, and executive functioning at the beginning and end of their first semester in college. Intervention students received three lectures (with take-home exercises) designed to teach OTMP skills. Students in the intervention group reported significant improvements compared to the control group on measures of impairment, as well as inattention, with medium to large effects across these significant findings. These results indicate that including OTMP training as one component of an intervention package may improve at-risk students' adjustment to college.

In the United States, those who acquire a bachelor's degree earn approximately 74% more annually than those whose highest level of education is a high school diploma (based on median annual salaries; U.S. Census Bureau, 2011). Further, individuals who graduate from a four-year college acquire higher occupational status and lifetime earnings (Pascarella & Terenzini, 1991). On average, just over half of students (58%) who begin college (at a four-year public university) go on to graduate within six years (data from fall 2007 to 2012–2013 academic year; Kena et al., 2015). However, this figure is misleading because low-income, first-generation, and disability status greatly impacts rates of degree attainment. In fact, compared with students considered to be *low-risk* for drop-out (e.g., higher income, mother attained bachelor's degree), students at *high-risk* have been shown to be six times more likely to drop out during the first year of college (Ishitani & DesJardins, 2002). According to the United States Census data collected in 2015, 16.7% of those with a disability had attained a bachelor's degree compared with 34.9% of their non-disabled counterparts (Ryan & Bauman, 2016), and others have found one-third of students who begin college in remediation courses attain a bachelor's degree after six years (Complete College America, 2012). These high rates of attrition are costly for states, institutions, and students because there is no return on the initial investment in course enrollment. Graduating from college improves career opportunities, social capital, and general quality of life in these individuals (Johnson, 2012).

Students are considered *at-risk* for college withdrawal or failure as incoming freshmen if they are academically underprepared for college (broadly defined by federal funding arms as students with disabilities, first-generation students, and students from low-income backgrounds; Zeiser, Chan, Heuer, & Cominole, 2015). Academically underprepared students have low high school achievement (Grade Point Average; GPA < 3.0) and/or low standardized test scores (e.g., ACT < 21, ~50th percentile; Jaschik, 2016), which puts them at risk for being placed on academic probation and/or withdrawing

CONTACT Cynthia M. Hartung chartung@uwyo.edu Department of Psychology, University of Wyoming, 1000 E. University Ave., Laramie, WY 82071
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from the institution (Ishitani & DesJardins, 2002). Even though the importance of attaining a bachelor's degree has increased, a majority of students across the U.S. remains underprepared for college coursework. In 2016, only 26% of the two-thirds of high school graduates who took the ACT met college readiness benchmarks across English, math, reading, and science scores (ACT, 2016). In the current study, at-risk students will be defined as freshmen who have been conditionally accepted to a four-year public university due to being academically underprepared for college. In four-year public institutions, it is estimated that 6% to 20% (American College Health Association, 2016) of the total student body reported having a disability. Of those students with disabilities, 33% have reported being diagnosed with a learning disorder, 18% with attention-deficit /hyperactivity disorder (ADHD), and 15% with another psychiatric condition (Raue & Lewis, 2011). As the value of attaining a bachelor's degree increases, the need for interventions to aid these at-risk students is paramount.

For these at-risk college freshmen, the transition to college is especially difficult. Further academic responsibilities increase in college in addition to an abrupt loss of structure and support from family and friends (Fleming & McMahon, 2012). Compared to the highly regimented days of high school, life during college is largely unstructured. Most college academic work occurs outside of the classroom. Universities typically estimate that students should spend three hours on course material outside of class for every hour spent in lecture. However, first-year students reported spending almost 15 hours per week (which equates to about one hour per credit hour) on academic tasks outside of attending class in a large, multi-site survey study (National Survey of Student Engagement, 2017). For students to be successful, they must learn to manage and structure their days to complete academic work without close monitoring from teachers and parents (Fleming & McMahon, 2012). Accordingly, interventions to enhance college readiness skills are necessary for at-risk students.

Valentine et al. (2011) published the only known meta-analysis on programs aimed at retaining college students. Their review included a comprehensive search of studies that included at-risk freshmen who had participated in formal retention interventions in either a community college or four-year institution. No significant effects were found on retention (n = 11 studies) or GPA (n = 8 studies) included in the meta-analysis. However, a significant effect was found for GPA (d = 0.29) when methodologically sound studies (i.e., included adequate comparison group and intensive intervention; n = 9) were included. The interventions included in the nine aggregated studies varied, ranging from tutoring to smaller class size to learning study skills. As such, no strong conclusions could be made as to which specific interventions were most effective at improving academic performance in at-risk students.

Most of the existing research has examined effectiveness of interventions made up of multiple components (Zeiser, Chan, Heuer, & Cominole, 2015). Example components include smaller class sizes, additional academic advising, tutoring, and teaching study skills (Valentine et al., 2011). Additionally, first-year seminars (that include several different interventions) targeted at improving retention in at-risk students are inadequately described. Therefore, it is difficult to identify which specific components are linked with positive academic outcomes. Studies typically target effectiveness of programs for all freshmen instead of focusing on whether the program is effective for at-risk students. In sum, although some success at improving college achievement and retention has been shown, it is unclear which specific components are most effective. The current study is a preliminary examination of the effectiveness of a targeted brief intervention with at-risk freshmen using one specific component (i.e., organization, time-management, and planning [OTMP] skills training), with the goal of preventing academic failure.

First-year seminars and orientations for at-risk students often include modules aimed at improving students' OTMP skills to facilitate greater success in their freshmen year. OTMP skills trainings are often combined with other interventions to improve freshmen GPA and retention. Therefore, it is unclear which specific seminar component is linked with greater success. Two known studies have been conducted to determine the links among time management training, stress, and perceived control of time in first year students (Häfner, Stock, & Oberst, 2015; Häfner, Stock,

Pinneker, & Ströhle, 2014). In the first study, Häfner et al. (2014) recruited first year students (not considered at-risk students) to participate in a brief two-hour training at the beginning of the semester to learn the following time management strategies (originally developed as a workplace training): setting and monitoring specific daily and weekly goals, prioritizing tasks, increasing daily structure, and strategies to execute daily plan (i.e., implementation intentions; Häfner et al., 2014). Students were randomly assigned to participate in time management training or an active control activity of the same duration as the experimental group and completed measures of task demands, stress, and perceived control of time immediately before and two weeks after the intervention. There was a time by group interaction such that students in the time management group reported greater perceived control of time and decreased stress after the intervention compared to students in the control group, with small effect sizes (partial χ^2 for both analyses = 0.03; Häfner et al., 2014). However, it appears that this interaction was driven more by the deterioration of control group scores and not by a meaningful improvement in treatment group scores over the two-week period. This study suggested potential positive effects of time management training on stress and the ability to manage one's day. An intervention at the beginning of the first semester of college may be especially effective at managing stress, as workloads typically increase as the semester progresses.

The second study included a slightly longer time management intervention (four hours) that occurred during the middle of the semester with all students (not just first year students), did not include a control group, and measurements at baseline, two, and four weeks post-training (Häfner et al., 2015). Compared to baseline measures, students reported decreased stress and increased use of time management strategies at the two- and four-week follow ups and increased perceived control of time at the four-week follow-up (Häfner et al., 2015). Taken together, these findings suggest students' participation in a targeted brief time management intervention may result in decreased stress. However, it is unknown whether this translates into improvements in GPA. Additionally, further research is warranted to determine the appropriate dosage of a time management intervention for lasting effects to occur, and whether these positive effects are found for at-risk students. The current study is a preliminary attempt to fill some of these gaps by examining the effects of teaching OTMP skills to academically at-risk college freshmen within the context of a first-year seminar.

Institutions have focused on selecting students who will succeed in college (e.g., using standardized test scores and previous academic performance; Astin, 1997) and aiding students in increasing academic achievement once enrolled, with the goal of improving graduation rates (Grillo & Leist, 2013). Based on Tinto's theory of retention, student and institution characteristics interact, leading to student decisions on whether to persist in college (Tinto, 1975). With mixed success, institutions have focused on creating first-year programs (e.g., learning communities) to increase student academic and social integration for at-risk students and the general student population (i.e., modifying institution characteristics; Connolly, Flynn, Jemmott, & Oestreicher, 2017; Grillo & Leist, 2013). It is unclear which intervention components for first-year at-risk students are most effective at decreasing impairment and improving academic performance. Further, less is known about interventions that focus on malleable at-risk student characteristics (e.g., study habits, learning strategies) and how they might improve college achievement. For the general college student population, interventions related to enhancing academic skills and self-regulation have been related to improved college student performance and retention (Robbins, Oh, Le, & Button, 2009). Although Tinto's (1975) theory has been revised (integration-commitment to institution instead of integration) to accommodate a more diverse student population, the theory does not address how college readiness skills play a role in persisting in college (Tinto, 2006). Current interventions based on Tinto's retention theory may be inadequate at improving retention for at-risk students. Therefore, interventions based on other theories that better account for at-risk student academic impairment may be needed.

Another theory that may be relevant for academically underprepared college students is executive dysfunction, or deficits in self-regulation behaviors (linked to areas in the prefrontal cortex in the brain; Sonuga-Barke, 2004). Executive functions (EF;

working memory, attentional shifting, self-monitoring, planning ahead, task persistence, organization; Barkley, 1997; Barkley & Fischer, 2011) aid us in regulating behavior to meet a desired outcome. EF deficits have been linked with poorer use of study skills in college students and may contribute to poor academic performance (Peterson, Lavelle, & Guarino, 2006). Although EF deficits in college students have been primarily examined with ADHD samples, college students without a diagnosis of ADHD share these EF deficits. College students with difficulties planning ahead, staying organized, and maintaining motivation report increased impairment (Dorr & Armstrong, 2018) and decreased use of effective learning and study strategies (e.g., time management, test taking skills; Peterson et al., 2006). Further, these deficits manifest in college students via difficulties with keeping track of assignment due dates, losing important items, procrastinating, difficulty completing large, multi-step papers and projects, and poor class attendance, among others (DuPaul, Weyandt, O'Dell, & Varajao, 2009; Rabin, Fogel, & Nutter-Upham, 2011). In addition to learning study skills and improving motivation, learning time management and organization skills have been linked to better academic performance in at risk students (Proctor, Prevatt, Adams, Hurst, & Petscher, 2006).

The feasibility of prevention and intervention programs for at-risk college students vary widely. Summer bridge programs are designed to address the skills gap that students have not learned during high school so they may enter college equipped with adequate strategies to cope with the new academic challenges of colleges. However, these programs are not accessible to all at-risk students, as they may cost an additional fee (DeRoma, Bell, Zaremba, & Abee, 2005). College transition programs that occur outside of students' typical course schedule may only be effective for higher functioning (e.g., highly organized to incorporate an additional time commitment to their schedules) and motivated students. Academically at-risk first year students with disabilities typically underutilize support services and accommodations and service utilization has not been shown to be predictive of GPA (Gormley, DuPaul, Weyandt, & Anastopoulos, 2016). For example, course accommodations may not be effective in improving academic performance, as students given extended time on tests did not show improved grades (Jansen, Petry, Evans, Noens, & Baeyens, 2018). It may be more feasible and acceptable to students to participate in a prevention/intervention program that is embedded within in the context of a credit-garnering course. First-year students may be more motivated to learn skills to enhance their academic performance because they are already earning credit for class attendance and participation.

Poor self-regulation stemming from executive dysfunction has a negative impact on at-risk college students (Fleming & McMahon, 2012). Therefore, we chose to focus on assessing the effectiveness of a brief targeted intervention (i.e., a low-dose intervention early in the student's college career to prevent worsening of academic impairment for students already identified as being at-risk for college failure) aimed at teaching OTMP skills to compensate for these deficits. A brief targeted OTMP intervention was indicated for the following additional reasons: (a) These skills have been identified as predictors of academic success for students with learning disorders and or ADHD. Specifically, predictors include time management, academic self-regulation (e.g., implementing study skills; Advokat, Lane, & Luo, 2011; Ruban, McCoach, McGuire, & Reis, 2003), completing assignments on time, and procrastination (DaDeppo, 2009; Hen & Goroshit, 2014). (b) Teaching OTMP skills to students in the general college student population has been linked with better time management and decreased stress (Häfner et al., 2014, 2015). Similar brief interventions may benefit at-risk students to an even greater extent given they arrive to college unprepared to manage academic responsibilities. For example, LaCount, Hartung, Shelton, and Stevens (2018) found that at-risk students reported decreased academic impairment and fewer symptoms of inattention and hyperactivity after a brief OTMP intervention. (c) We wanted to focus on one specific intervention component in brief instead of an entire intervention package given the scarcity of quality studies that test one treatment and call for such studies (DuPaul et al., 2009; Valentine et al., 2011). OTMP skills training has been included in at-risk student prevention and intervention packages, but it is unclear of any lasting effects on academic impairment (Valentineet al., 2011). Knowing which treatment components are most effective would allow university officials to create the most efficacious treatment packages for at-risk students.

The current study examined the effects of a brief targeted OTMP skills intervention with at-risk college freshmen at a four-year public university. The brief three-hour early intervention was provided to students in the context of their first-year seminars during the fall semester and was based on a cognitive behavioral treatment for ADHD (Solanto, 2011). We chose to use modules from a treatment that was developed for use with adults with ADHD because the treatment was designed to target EF deficits, which may interfere with at-risk students' academic performance, as mentioned above. Additionally, we used this intervention because we expected a higher incidence of ADHD in a sample of at-risk college students and the modules specifically target executive functioning deficits, which may impact college students who report significant academic impairment (i.e., effective for other students in addition to those with ADHD; Dorr & Armstrong, 2018). In fact, the current sample evidenced comparable levels of ADHD symptoms compared with a sample of college students specifically recruited for ADHD symptom elevations and academic impairment (LaCount et al., 2018). Thus, we included ADHD symptoms as outcome variables in addition to measuring impairment, executive functioning, and objective academic outcomes. Based on previous studies (Häfner et al., 2014, 2015; LaCount et al., 2018), and poor academic self-regulation stemming from EF deficits, we expected that compared to at-risk freshmen who did not receive the brief targeted OTMP intervention, at-risk freshmen who received the OTMP intervention would report reduced symptoms of ADHD, lowered daily functional impairment, improved academic performance, and increased use of compensatory OTMP strategies following the early intervention.

Method

Participants

Participants were 66 first-semester, full-time college freshman (32 females, 24 males) enrolled in a program for students who were admitted conditionally to a four-year university in the Rocky Mountain Region of the United States. Incoming freshmen students are strongly encouraged to participate in this program if their high school GPA was below 3.0 or their ACT composite score was lower than 21 (students may be eligible if they met both criteria). Students in the conditional-admittance program had a high school GPA below 3.0 (sample M = 3.11, SD = 0.44, range = 2.4–4.0) and/or an ACT composite score below 21 (sample M = 19.95, SD = 3.28, range = 15–33). Students in the program were enrolled in 1 of 18 freshman seminar sections. Each seminar section course content differed (e.g., current affairs and the media, exploring African cultures, climate change, government politics), while instructors emphasized critical thinking, reading and writing skills. Additionally, in all seminar sections, instructors were asked to provide some coverage of transition to college skills (e.g., time management, exam preparation, note taking, campus engagement, advising, effectively communicating with professors). However, it was left to the individual instructors to decide how to integrate these college transition skills and how much emphasis to place on each topic.

Of these 18 sections, 6 instructors volunteered to have their class receive the brief targeted intervention (i.e., three guest lectures on OTMP skills). Thus, students in these 6 sections received this early intervention and were invited to complete online surveys (pre- and post-intervention during the study semester; i.e., *semester 1*) as part of the experimental group. Students in the remaining 12 sections did not receive the intervention and were invited to complete pre- and post-intervention online surveys (during semester 1) as part of the active control group. From the 6 experimental sections, 31 students chose to complete the online surveys. From the 12 active control sections, 35 students chose to complete the online surveys. All students who completed the online surveys received monetary compensation or research participation credits.

Measures

Demographics form

The demographics measure included items regarding age, sex, first generation student status, mother's education level, father's education level, and high school grade point average.

Barkley adult ADHD rating scale-IV: current symptoms (BAARS; Barkley, 2006)

This measure consists of 18 items that closely follow the *DSM-IV* criteria for ADHD and is divided into two subscales (Inattention, Hyperactivity/Impulsivity). Participants indicated how often they have experienced each item from 1 (*Never or rarely*) to 4 (*Very often*) during the previous six months on the pre-intervention survey and how often they experienced each item since taking the pre-intervention survey on the post-intervention survey. Internal consistency (alpha) values for the subscales have ranged from .78 to .91 (Barkley, 2006). The current study Cronbach alpha values were .90 for the Inattention subscale and .78 for they Hyperactivity/Impulsivity subscale.

Weiss functional impairment rating scale (WFIRS; Weiss, 2000)

This measure consists of 70 items designed to measure current ADHD-related impairment across seven domains of functioning (i.e., Family, Work, School, Life Skills, Self-Concept, Social, and Risk). Participants rate how often they experience each item by selecting *Never/Not at all, Sometimes or Somewhat, Often or Much*, or *Very Often or Very Much*. Canu, Hartung, Stevens, and Lefler (2016) examined the psychometric properties of the WFIRS in college students. Internal consistency for the total score was excellent (.96) and for the seven subscales it was good to excellent (.85 to .94). The WFIRS subscales were significantly correlated with another published measure of ADHD-related impairment (with large effect sizes, $r > .50$).) Canu et al. (2016) also correlated the WFIRS school subscale with self-reported college GPA. The correlation was significant ($p < .001$) and the effect size was moderate ($r = -.33$). Notably, Canu et al. (2016) also found the WFIRS was related to internalizing symptoms in addition to ADHD. Cronbach alpha values in the current sample ranged from .83 to .94 across subscales.

Organization, time management and planning (OTMP) measure

This measure contains items asking participants to indicate how often they use specific OTMP skills and strategies (e.g., put appointment into calendar, prioritize tasks on to-do list) during the past week. This 12-item measure was created for another study in our lab and items correspond to the use of strategies taught in the brief behavioral intervention. Participants indicated the number of days during the week (0–7) they had used OTMP strategies. The 12 items were summed for a total score (possible scores range from 0–84), with higher scores indicating more use of OTMP strategies to manage academic responsibilities. Example items include, "Added an appointment to my calendar," "Added a task to my to-do list," Broke a large or aversive task into smaller, more manageable tasks." Previous Cronbach's alpha values range from .87 to .96 (LaCount et al., 2018) and the current sample yielded a Cronbach alpha value of .89.

Barkley deficits in executive functioning scale

(BDEFS; Barkley, 2006). The BDEFS is an 89-item self-report measure comprised of five factors (i.e., Self-Management to Time, Self-Organization and Problem Solving, Self-Restraint or Inhibition, Self-Motivation, and Self-Activation/Concentration). Responses are based on a 4-point Likert scale (i.e., *never or rarely, sometimes, often*, or *very often*). The measure was normed on 1249 male and female adults ranging in age from 18 to 96. Internal consistency was above .90 for the total score and all five subscales (Barkley, 2006). Barkley also reported satisfactory test-retest reliability for a subgroup of the sample ($r = .84$ for the total EF Summary score). All Cronbach alpha values in the current study exceeded .87.

Grade differential index (GDI)

As a measure of academic impairment, the grade differential index was created as an alternative to GPA, which does not account for the degree of difficulty of each class. The measure allowed a direct comparison between grades earned by study participants and grades by their peers who were enrolled in each of their classes. A comparison to peers' grades enrolled in the same course accounts for the course degree of difficulty. We received permission to look up participants' grades for each course they were enrolled in for the study semester and for the

semester following the study. Next, we obtained grade frequency information and the number of students in each course from the registrar's office. We then calculated a mean and standard deviation for each course. We created a GDI for each participant for each course by dividing the difference between the grade the participant earned and the class mean by the standard deviation. GDI values indicate the number of standard deviations away from the class mean. A negative GDI value indicates the participant earned that number of standard deviations below the class mean (i.e., −0.5 GDI = ½ SD below the class mean) and a positive GDI value indicates the participant earned that number of standard deviations above the class mean (i.e., 0.5 GDI = ½ SD above the class mean). An aggregate mean GDI value was calculated for each participant, weighted by the number of credits they were enrolled in for each semester. Participant mean GDI values indicated the number of standard deviations away from the mean grades for all enrolled courses, weighted by the number of credits. GDI was calculated for participants for their grades earned at study semesters 1–4 (participation semester and the following three semesters).

Enrollment status

This was defined as whether or not study participants were still enrolled in the university at *semester 4*, three semesters following their study participation semester. We obtained participant enrollment status by looking at their academic record after they had provided permission to do so.

Credits ratio

We calculated the ratio of the credits completed to attempted for study semesters 1–4 by dividing the number of course credits completed by the number of course credits attempted. This ratio was then multiplied by 100 and is expressed as a percentage in the current study. Credits attempted was defined as the total number of credits the student was enrolled in during a given semester. Completed credits included credits for courses in which participants earned an A, B, C, or D grade. If the participant earned an F or had withdrawn from the course after the drop/add deadline the credits were not counted as completed. The credits ratio can be a proxy of whether students pass their courses or have to repeat them, and whether they are making adequate progress toward attaining a degree.

Procedure

All study procedures were approved by the Institutional Review Board. Classroom announcements explaining the study were made in all 18 seminar sections, and interested students provided email addresses to the researchers (occurred during semester weeks 2–4; see Figure 1 for the participant flowchart and which weeks in the study semester 1 that each step was carried out). Participants in the brief targeted intervention and control groups completed all pre- and post-measures online. They completed an online consent form followed by the demographics form and BAARS, WFIRS, OTMP measure, and BDEFS. The online survey was completed once during weeks 5–7 of their first semester and a second time during weeks 12–16 of the semester (both during study semester 1). Participants were also asked to give permission for the researchers to access their academic record online through the university. This allowed us to collect data regarding course grades and credits ratios earned during the study participation semester and the following three semesters (study semester 1, semester 2, semester 3, and semester 4, respectively) as objective measures of academic impairment.

Brief targeted classroom intervention

For the six experimental sections, doctoral student researchers conducted three guest lectures in the freshman seminar covering OTMP skills. The study took place in the fall semester of 2015. This was a 16-week semester including finals week. The three guest lectures were administered between weeks 6 and 10 of the semester. Three graduate students each provided the guest lectures for two sections. The same graduate student administered all three guest lectures within their two sections. Skills taught in each lecture were based on a portion of an existing intervention programs for adults with ADHD (i.e., Solanto, 2011; *Cognitive-Behavioral Therapy for Adult ADHD:*

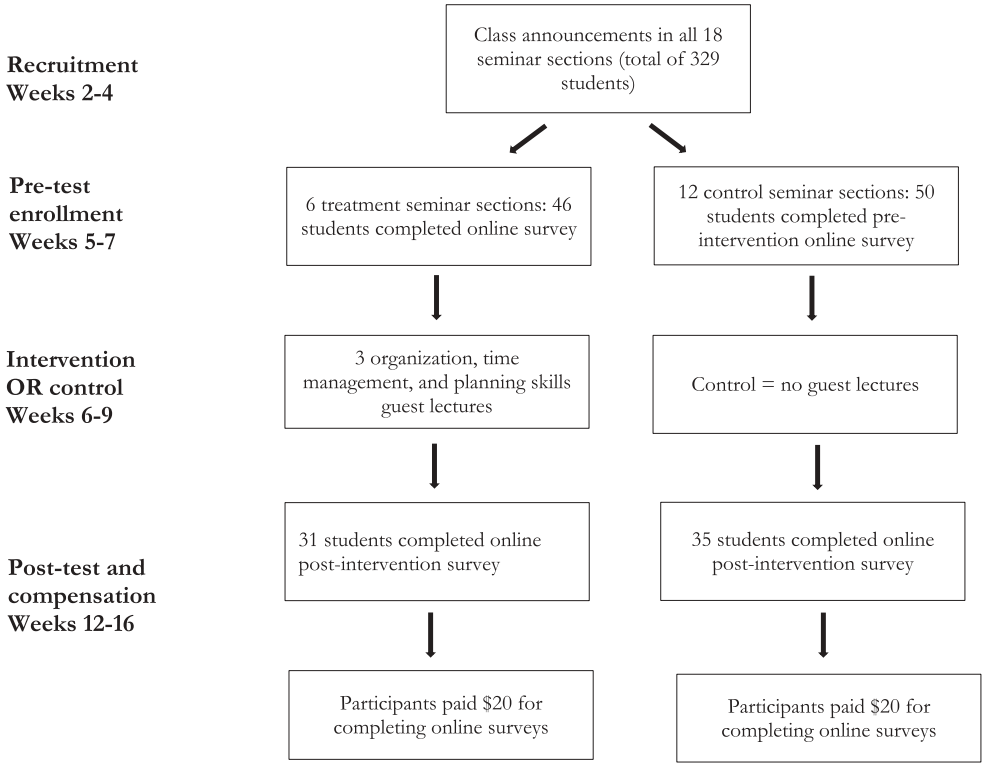

Figure 1. Participant flowchart.

Targeting Executive Dysfunction) focusing on OTMP skills. However, the Solanto (2011) program was developed for adults who are beyond college age. Therefore, materials were adapted for college students in the current study. Specifically, multiple examples relevant for college students were used throughout the lectures. Students were taught to create and implement a calendar system, monitor time management, break tasks down into smaller steps, prioritize tasks, and reward themselves for task completion. Class sessions were largely didactic in nature. Discussions focused on how to implement OTMP skills. Students were given take-home exercises that were completed in between OTMP lectures. Tasks to be completed outside of class lectures were based on skills learned during that week's class.

Lecture 1. The first OTMP lecture focused on time awareness, selection and use of a calendar or planner, selection and use of a task or to-do list, tips for successful scheduling, and how to use *time cracks* (small "slices of time" that can be used to complete short tasks to save time; Solanto, 2011, p. 102). Specifically, advantages and disadvantages of electronic and paper planners or calendars were discussed. Students were asked to experiment with various calendars and choose one to use for the semester. It was recommended that students only have one calendar or planner, that they carry it with them at all times, that they enter every class meeting or appointment in their calendars, and that they consult their calendar several times per day (Solanto, 2011). After reviewing calendar options, discussion focused on choosing a task list system. This could also be paper (e.g., a notepad) or electronic (e.g., Wunderlist™, Apple Notes™) but, again, should be something that they would have with them at all times. Students were encouraged to set up tasks lists for each class and for personal items or they could choose to have one combined list of all tasks.

With regard to tips for successful scheduling, students were advised to keep regular work hours, schedule repeated tasks for the same time each day or the same day and time each week (e.g., take the recycling out on Wednesday evenings), plan challenging tasks when their motivation might be higher and easier tasks when they might be more tired. It was also recommended that students schedule larger blocks of time for writing assignments than for other types of homework. Finally, as outlined by Solanto (2011), taking advantage of *time*

cracks was emphasized (i.e., when there are a few extra minutes between activities, students should try to complete a short task from their list such as sending an e-mail or making a phone call). Prior to the next OTMP lecture, students were asked to evaluate their current calendar and task list systems and to choose new ones if not completely satisfied. They were also asked to work on increasing their time awareness skills by estimating how long tasks would take, keeping an activity log to see how long they took, and then comparing estimated to actual time.

Lecture 2. The second OTMP lecture focused on completing tasks that are boring, repetitive, tedious, or effortful (Solanto, 2011). Two strategies were discussed to increase motivation for completing these types of tasks. First, the group learned about breaking down large and/or aversive tasks into smaller steps. Second, the group discussed rewarding oneself for task completion. With regard to breaking tasks down into smaller steps, students were asked to give examples of tasks from their lists that they were having trouble completing. Often these were very large tasks (e.g., write a 5-page paper), highly aversive tasks (e.g., completing a tedious and long application for financial aid) or both (e.g., write a 20-page term paper). It was recommended that these tasks be broken down into smaller steps of sub-tasks (e.g., choose topic for paper, conduct literature search, read each article and write summary paragraph, write introduction, write body paragraphs using previously written summary paragraphs, write conclusion, and proofread). Each of these steps can be entered individually in the task list and completing one by one. This often helps with procrastination because it feels more manageable to *conduct a literature search* than to *write a term paper*.

Next, the group discussed rewarding yourself for completing tasks. It was recommended that students consider pleasurable activities they participate in each day as rewards (e.g., using social media, walking the dog, reading a magazine, watching a show on Netflix, listening to music, eating a snack) for completing things on their lists. The *when-then* and *Premack principle* were reviewed to help students follow through with tasks (e.g., When I finish reading this chapter, then I can take my dog for a walk). The importance of being strict with oneself to ensure actual task completion prior to accessing the reward was stressed. Another implementation strategy discussed was to make an informal contract with a friend (e.g., Don't let me leave the library to go home and watch television until I have finished reading and summarizing three articles for my term paper). Prior to the final OTMP lecture, students were asked to try breaking one of their tasks down into smaller steps and to practice rewarding themselves with pleasurable activities after completing a task.

Lecture 3. The final OTMP lecture focused on prioritizing (Solanto, 2011). The group discussed that there are often more things on a task list in a given day or week than can actually be accomplished. Thus, a strategy for choosing which tasks to complete first and which ones to save for another time is essential. This can be especially problematic for those with organizational difficulties who might end up doing nothing or doing the task at the top of the list even if something else is more urgent or important. Students were instructed to evaluate tasks based on *urgency* and *importance*. *Urgency* refers to whether the task is associated with a deadline or due date and *importance* related to how critical it is to one's short- or long-term personal goals. Students were asked to consider personal goals and values in determining which tasks are most important. Using a student volunteer's task list as an example, the graduate students taught how to use an urgency and importance grid with four quadrants (i.e., important and urgent, important but not urgent, urgent but not important, not important and not urgent; Covey, 1989).

Results

Data screening

All values across self-reported dependent variables were in the expected ranges for both the brief targeted intervention and control groups. The majority of participants completed all measures in the pre and post surveys. One control group participant did not complete the post OTMP measure or post BDEFS, and one intervention group

participant did not complete the post-intervention BDEFS. Participants' data were included in analyses for completed measures, regardless of whether they completed the pre- and post-surveys in their entirety. Univariate outliers (> ± 3 SDs) were identified for several WFIRS subscale scores. All outliers were included in final analyses because they were regarded as a continuation of the distribution. Some outliers were expected, given the sample included at-risk freshmen. Distributions were generally positively skewed, as most participants did not endorse experiencing items very frequently. The data were analyzed without using a transformation given that repeated measures ANOVAs are robust to violations of normality, and other assumptions of conducting repeated measures ANOVAs were not violated (e.g., similar sample sizes across groups, similar distribution shapes across variables, equal variances for dependent variables across groups). A final data set (N = 66) was used for the following analyses.

Preliminary analyses

Independent samples t-tests were conducted to compare intervention and control group participants on demographic variables. There were no significant differences in age, father's education, mother's education, ACT composite scores, or high school GPA. Next, chi-square analyses were conducted to examine distributions of males vs. females and first-generation college students vs. not first-generation students across the intervention and control groups. The chi-square for first generation status was not significant. However, the chi-square for sex was significant (χ^2 = 11.90, p = .001) such that there were more women (n = 29) than men (n = 6) in the control group relative to the number of women (n = 13) and men (n = 18) in the intervention group. Given this difference, sex was used as a covariate in our remaining analyses.

Primary analyses

To examine group differences on outcome variables across pre- and post-intervention, 2 × 2 ((Intervention and Control Groups x time 1 vs. time 2) repeated measures ANOVAs were conducted (see Table 1). Time 1 measures were collected during weeks 5–7 of the fall semester and time 2 measures were collected during weeks 12–16 of the semester. Outcomes on the WFIRS total score indicated that participants in the intervention group reported less impairment over time while participants in the control group reported more impairment over time (p = .005; see Figure 2). A large effect size (η^2 p = .12) indicates 12% of the variance in WFIRS total score may be accounted for by being in the intervention group (Cohen, 1988). Post-hoc analyses of WFIRS subscale scores produced significant differences on the family, life skills, self-concept and social subscales, with students in the intervention group reporting less impairment compared to students in the control group. Effect sizes for these WFIRS subscales indicated medium to large

Table 1. Differences between intervention and control groups on pre- and post-measures.

	Intervention Group (n = 31)		Control Group (n = 35)		Group x Time Interaction		
Variable	Pre-test M (SD)	Post-test M (SD)	Pre-test M (SD)	Post-test M (SD)	F	p	η^2 p
WFIRS Total	0.43 (0.51)	0.33 (0.39)	0.30 (0.21)	0.41 (0.40)	8.67	.005	.12
WFIRS Family	0.31 (0.43)	0.23 (0.38)	0.20 (0.27)	0.33 (0.45)	8.00	.006	.11
WFIRS Work	0.30 (0.59)	0.19 (0.35)	0.08 (0.11)	0.14 (0.35)	3.14	.081	.05
WFIRS School	0.48 (0.62)	0.46 (0.48)	0.32 (0.27)	0.50 (0.53)	3.30	.074	.05
WFIRS Life Skills	0.51 (0.58)	0.39 (0.39)	0.42 (0.36)	0.59 (0.70)	4.55	.037	.07
WFIRS Self-Concept	0.97 (0.87)	0.65 (0.60)	0.89 (0.76)	0.97 (0.93)	5.24	.025	.08
WFIRS Social	0.41 (0.61)	0.24 (0.33)	0.22 (0.23)	0.36 (0.43)	10.29	.002	.14
WFIRS Risk	0.32 (0.47)	0.29 (0.45)	0.24 (0.30)	0.29 (0.28)	2.48	.121	.04
OTMP Skills	49.84 (22.01)	49.19 (22.16)	52.79 (20.05)	47.53 (20.12)	1.74	.192	.03
BAARS Inattention	15.29 (6.50)	14.68 (5.00)	13.20 (3.63)	15.00 (5.50)	4.12	.046	.06
BAARS Hyperactivity	16.71 (7.01)	15.94 (6.05)	14.86 (5.4)	15.86 (6.45)	1.86	.177	.03
BDEFS Total	141.70 (46.18)	134.07 (43.96)	131.94 (40.17)	142.85 (52.82)	3.81	.056	.06

Note. WFIRS = Weiss Functional Impairment Scale, OTMP = Organization, Time Management and Planning, BAARS = Barkley Adult ADHD Rating Scale, BDEFS = Barkley Deficits in Executive Functioning Scale. *For partial eta-squared (η^2 p), a small effect size is* η^2 p = .01, a medium effect size is η^2 p = .06, and a large effect size is η^2 p = .14 (Cohen, 1988).

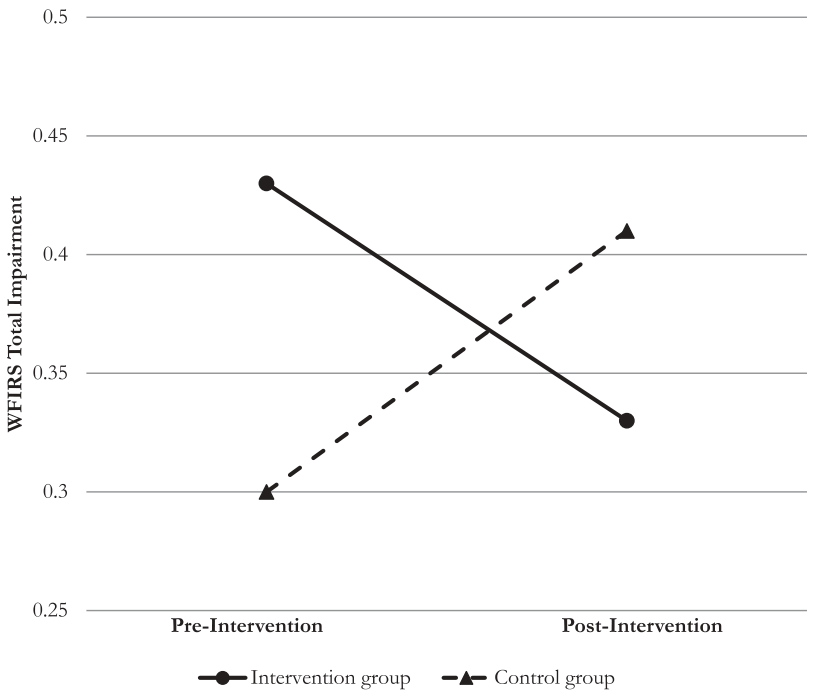

Figure 2. WFIRS = Weiss Functional Impairment Rating Scale. Group x time interaction on WFIRS total impairment score.

effects between the intervention and control groups across pre- and post- scores (η^2 p = .07 to .11) While the WFIRS school impairment subscale analysis did not meet the $p < .05$ threshold, a small effect size was found, η^2 p = .05.

Next, two repeated measures ANOVAs were conducted to examine changes on the BAARS. The analysis for inattention was significant (p = .046), with a medium effect size (η^2 p = .06). Participants in the intervention group reported lower severity of inattention over time while participants in the control group reported higher severity of inattention over time. The analysis for hyperactivity/impulsivity was not significant. Two additional ANOVAs were conducted to examine changes on the BDEFS and OTMP measure. There were no significant group differences on either of these measures over time, although the BDEFS total score analysis resulted in a medium effect size (η^2 p = .06).

Finally, the intervention and controls were compared on additional academic outcomes. A chi-square analysis was conducted to determine whether enrollment status at semester 4 differed across the two groups. The results indicated equivalent persistence, as 12 and 14 participants in the intervention and control groups, respectively, were no longer enrolled in the university at the beginning of study semester 4 (χ^2 = 0.04, p = .852). Because of these low retention rates for those in our sample (similar to retention rates of at-risk students in general), data analyses for the credits ratio and GDI included fewer participants compared to the pre-/post-intervention comparisons. Two 2 × 4 (intervention and control group x four semester measurement points) repeated measures ANOVAs were conducted to determine the presence of any differences across semesters 1–4 (semester 1 = intervention semester, semester 2 = 1 semester after intervention semester, etc.) for the credits ratio and GDI (see Table 2 and Figure 3). Results indicated no significant differences for the credits ratio across semesters by group (intervention group n = 17, control group n = 14), F (3,87) = 1.41, p = .245, η^2 p = 0.05. Similarly, no significant differences were found for GDI across the four semesters by group (intervention group n = 16, control group n = 14), F (3,84) = 1.70, p = .174, η^2 p = 0.08. Because the omnibus effect size fell in the medium range, a post-hoc t-tests was carried out for GDI at semester 4 between the intervention and control groups. This follow-up test indicated a non-significant p-value, with a medium effect size, t (30) = 1.57, p = .127, d = 0.56, indicating that at semester 4, the intervention group GDI was approximately ½ standard deviation better compared to the GDI of the control group.

Table 2. Means and standard deviations of GDI and credits ratio.

	Intervention Group				Control Group			
	Semester 1 M (SD)	Semester 2 M (SD)	Semester 3 M (SD)	Semester 4 M (SD)	Semester 1 M (SD)	Semester 2 M (SD)	Semester 3 M (SD)	Semester 4 M (SD)
GDI	0.35 (0.51)	0.02 (0.53)	−0.09 (0.53)	−0.10 (0.61)	0.32 (0.48)	−0.06 (0.66)	−0.19 (0.63)	−0.55 (0.96)
Credits Ratio	94.12 (19.70)	91.70 (13.11)	96.18 (11.11)	97.40[a] (7.34)	94.38 (9.23)	83.71 (24.52)	88.74 (22.20)	80.31[a] (35.72)

Notes. GDI = Grade differential index. GDI is similar to z-scores, with a mean of zero. Positive values indicate performance above the mean across all courses taken in a given semester and negative values indicate performance below the mean across all courses taken in a given semester. Credits ratio = (credits completed/credits attempted) *100, higher values indicate a higher number of classes that were passed in a given semester. [a] A post-hoc *t*-test indicated a non-significant *p*-value, with a medium effect size, $t(30) = 1.57$, $p = .127$, $d = 0.56$, indicating that at semester 4, the intervention group GDI was ½ standard deviation better compared to the control group.

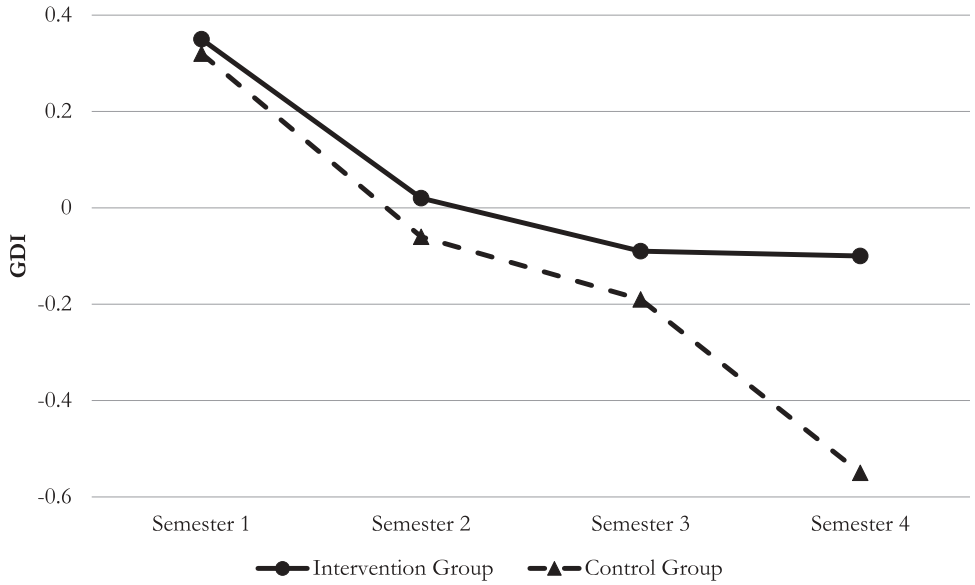

Figure 3. GDI = Grade Differential Index. GDI mean values for participants in the intervention and control groups across semesters 1–4.

Discussion

The current study was designed to assess the effectiveness of a brief targeted OTMP skills intervention on impairment, ADHD symptoms, EF, OTMP skill use, and academic outcomes in academically at-risk college freshmen. The intervention was a brief didactic prevention program designed to aid freshmen in acquiring skills to prevent academic failure. From pre- to post-intervention (within study semester 1), at-risk freshmen who received the intervention reported less overall impairment in the domains of family, life skills, self-concept and social and decreased inattention severity compared to freshmen who did not receive the intervention. No statistically significant differences were found for OTMP skill use, hyperactivity/impulsivity severity, EF, self-reported school impairment, grades, enrollment status, or the credits ratio. However, small to medium effect sizes were found for the self-reported EF and school impairment such that students in the intervention group reported less EF and school impairment compared to students in the control group at the end of the semester.

Although our findings are very preliminary, they suggest that teaching OTMP skills to academically at-risk freshmen may be a promising intervention to decrease academic impairment during the first year of college. The current sample consisted of academically at-risk freshmen who had been conditionally accepted to the institution. They were all enrolled in first-year seminars designed to teach research and critical thinking skills. College transition skills (e.g., time management, exam preparation, note-taking, campus engagement, advising, effectively communicating with professors) are included in these courses at the discretion of the instructor. Students in the intervention group received an extra dose of OTMP skills (i.e., three hours of guest lectures with take-home exercises), while students in the control group

received *treatment as usual* and should be considered an active control group. Students in the intervention group reported decreased levels of inattention after the brief intervention. The OTMP modules are from a treatment manual designed to target inattention, among other symptoms related to ADHD (Solanto, 2011). Decreases in inattention in the current sample may have been a result of the sample including students with ADHD and/or that these modules may also be effective at reducing symptoms of inattention for those without ADHD. Self-reported decreased overall impairment and decreased inattention levels by freshmen in the intervention group suggests briefly targeting additional OTMP skills may be promising. OTMP skill use may be helpful to academically at-risk student success due to the increased demands once arriving to college, the abrupt loss of structure of the high school day, loss of external accountability (e.g., from parents, teachers; Fleming & McMahon, 2012), and challenges specific to academically at-risk students (i.e., symptoms stemming from ADHD, learning problems, or other psychiatric disorders). For example, when successfully implementing OTMP skills, students will use a calendar to plan out when they will complete assignments, accurately estimate how long tasks will take to complete, and prioritize assignments based on urgency and importance. Although students may have adequate study skills and use appropriate learning strategies (needed for college success; Grillo & Leist, 2013), without planning ahead and managing their time, they will not be applying these skills optimally (Thibodeaux, Deutsch, Kitsantas, & Winsler, 2017). As such, at-risk students may benefit from learning OTMP skills so they are able to implement additional college transition skills.

Contrary to our expectations, no statistically significant difference was found for self-reported school impairment between the intervention and control groups from the beginning to the end of the semester. As discussed further below, our null findings for academic impairment may be due to the need for continued care (i.e., additional sessions) throughout the student's college career that is tailored to the individual's specific needs. Other unanticipated results included improvements in the areas of life skills, self-concept, and social for students in the brief intervention. It is hypothesized that perhaps the ability to manage daily academic responsibilities decreases stress across all domains, which may leave more time and energy to devote toward academic tasks. It is also possible that being able to manage time adequately, remain organized, and prioritize tasks will improve students' self-efficacy, which translates into decreased reported stress levels. Students who feel confident in their abilities to organize their lives may feel better about their interpersonal relationships (i.e., social domain), for example.

Our findings of reported decreases in symptoms of inattention are commensurate with previous studies using a brief time management intervention with college students, while our lack of findings related to academic impairment, OTMP skills use, and EF deficits were inconsistent with previous studies. LaCount et al. (2018) found decreased academic impairment and inattention in academically impaired college students (mostly freshmen and sophomores), and Häfner et al. (2014, 2015) found improved time management and decreased stress in college freshmen following brief OTMP and time management interventions, respectively. Although the current study did not result in significant decreases in academic impairment, students in the intervention group reported significantly less overall impairment, while students in the control group reported higher levels of overall impairment. While statistically significant, the intervention group experienced a decrease in impairment that may be not clinically meaningful. However, this may indicate students in the intervention group were able to avoid deterioration of functioning that typically occurs during the end of the semester (i.e., in preparation for and taking final exams). Future studies should examine whether OTMP skills training is related to an overall decrease in stress, which then allows for improved functioning and overall adjustment to college.

Post-secondary institutions concerned with student retention rates may consider teaching OTMP skills to all incoming freshmen given that they are coping with loss of structure and increased academic demands. Although not all academically at-risk students have ADHD, interventions initially designed to treat adult ADHD (Solanto, 2011) that have been adapted for college students may be appropriate resources for universities when designing early intervention packages. Teaching OTMP skills may be easily incorporated into first-year seminars so all

at-risk freshmen may be reached. Programs to improve retention that occur within the context of a credit-garnering course may allow all at-risk students to participate (e.g., compared to summer bridge programs, Deroma et al., 2005). It appears that academic self-regulation (e.g., initiating homework tasks, persisting on aversive tasks, staying motivated) is predictive of college GPA and retention for at-risk students (Ruban et al., 2003) and the typical college student population (Robbins et al., 2009). Helping freshmen implement time management and organization strategies through OTMP skills training within a first-year seminar may translate into improved academic self-regulation.

Although participants in the OTMP intervention group reported improved outcomes on several measures including inattention and impairment, academic impairment (based on the WFIRS school impairment) were not significantly different across groups. However, based on within group analyses for the WFIRS School subscale from pre- to post-intervention, participants in the control group reported significantly increased school impairment (M pre = 0.32, M post = 0.50; p = .02, d = 0.42) while participants in the intervention group reported equivalent school impairment (M pre = 0.48, M post = 0.46; p = .81, d = 0.04). This suggests the freshmen who received the OTMP skills intervention may have avoided the deterioration during their first semester in college that was seen in controls. Although these results did not reach significance in the 2 × 2 ANOVA, findings from these paired comparisons suggest results were in the predicted direction and the lack of significant interaction could be the result of a relatively small sample size. Post-intervention measures were collected during the last few weeks of participants' first semester in college, at a time when they were faced with completing term papers, preparing for, and taking final exams for the first time. Students who did not receive the OTMP intervention may not have managed their time or planned for a stressful end of the semester, as evidenced in their reported higher levels of academic impairment. A brief targeted OTMP skills intervention for academically at-risk freshmen may help prevent a worsening of impairment during the course of a semester. Further, this prevention of impairment may aid freshmen in reducing the likelihood of being on academic probation during the spring semester or even dropping out after their first year of college.

We hypothesized that academic performance (as measured by GDI and the credits ratio) for freshmen in the intervention group would be significantly better compared to the control group after the spring semester and beyond (study semesters 2–4). Contrary to this hypothesis, the repeated measures ANOVA was non-significant for GDI across semesters 1–4. When compared to how other students in their classes performed, study participants earned similarly lower grades regardless of whether they received the brief OTMP skills intervention. However, the effect size for the omnibus test and a post-hoc *t*-test for group differences at semester 4 fell in the medium range (η^2 p = 0.08, d = 0.56; Cohen, 1988; see Figure 3), which suggests a greater sample size may be needed to detect significant group differences. A similar pattern was found for the credits ratio measure, as participants across both groups passed their classes at equivalent rates during semesters 1–4, and the effect sizes fell in the medium range as well (omnibus F-test: η^2 p = 0.05, *t*-test for group difference at semester 4: d = 0.66). These nonsignificant findings may have occurred because group differences on college achievement may not be evident until several semesters after receiving the OTMP skills training (i.e., participants' junior and senior years). Further, perhaps booster OTMP skills sessions and/or individual coaching to tailor the intervention to each individual in addition to the guest lectures may be needed to have a lasting impact on course grades. Others have found that interventions may not have an immediate impact on students' grades (Deroma et al., 2005; Robbins et al., 2009). However, it is expected that after students implement OTMP skills for more than one semester, their grades will reflect decreased impairment and improved academic achievement. Given the chronic nature of difficulties that place college freshmen at risk academically, these students may need continued support throughout their university careers. For example, impairment related to ADHD is often persistent and can worsen in the transition from high school to college. At-risk students may need early interventions that include more sessions than provided in the current study. Additional studies are needed to determine the

appropriate dosage of OTMP skills training and to track freshmen for a longer period of time post-intervention to determine which intervention components combine to improve grades. Several limitations may impact the generalizability of findings from the current study. Participants were not randomly assigned to the intervention or control group. Instructors for 6 out of 18 sections volunteered to incorporate guest lectures into their course syllabi and thus offer their students an opportunity to participate in the intervention group. These instructors were particularly enthusiastic about their students receiving additional OTMP skills training, as they encouraged their students to implement the skills (although it is unknown whether any systematic differences between intervention and control group instructors). In fact, two instructors made take-home exercises from the guest lectures a part of students' class participation grades. Students in these sections of the intervention group may have been more likely to implement OTMP skills compared to students in sections with instructors who did not make the take-home exercises a part of their grade. While the guest lecturers encouraged the students to complete the take-home exercises, the proportion of participants who completed these is unknown. Additionally, it is unknown to what extent instructors taught OTMP skills outside of the brief intervention across all course sections. Consequently, participants may not have received a uniform dose of OTMP skills training. The OTMP skills were largely didactic, as they were taught in the context of guest lectures during first-year seminars. The lectures included group exercises and demonstrations with student participation, but the skills practice was not individualized. Therefore, students may not have implemented the skills as readily because their specific barriers to utilizing the skills outside of class were not addressed. Further, not all students in the first-year seminar sections in the intervention and control groups completed the pre- and post-intervention survey measures. The small sample size precluded analyzing outcome measures for men and women separately so it was unclear whether OTMP skills training may be more effective for men or women. The sample lacked racial and ethnic diversity so it is unknown whether findings from the current study would generalize to minority students. Future studies should incorporate random assignment in their study design and include larger samples of diverse student samples. Finally, to determine whether the implementation of OTMP and college readiness skills translate to practical outcomes related to progress toward degree attainment, future studies should include measures of academic impairment such as GDI and credits completed/attempted ratios. The pre-intervention measures were collected during the first 2–4 weeks of the semester, so students may not have been fully aware of or experienced impairment. Thus, these pre-intervention measure scores may have been an underestimate of their true levels of impairment. Additionally, as noted above, the sample included at-risk students with a wide variety of reasons for inclusion in the conditional admittance program (e.g., ADHD, learning disorder, low motivation). Given the heterogeneity of the at-risk sample, it is unclear whether an early OTMP skills intervention would impact these students similarly.

Despite the above limitations, the current study suggests that OTMP skills training may be a promising brief targeted intervention component to improve college achievement in at-risk students. Future dismantling studies should continue to assess single intervention components to determine which combination of intervention components would be most time-efficient and cost effective for institutions to implement.

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ORCID

Anne E. Stevens http://orcid.org/0000-0001-7476-2372
Patrick A. LaCount http://orcid.org/0000-0002-2993-8743

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