

Assessing the Impact of ADHD Coaching Services on University Students' Learning Skills, Self-Regulation, and Well-Being

Sharon Field
David R. Parker
Shlomo Sawilowsky
Laura Rolands
Wayne State University

Abstract

The effects of coaching on learning and study skills, self-regulation, and subjective well-being of students with ADHD attending 2- and 4-year colleges or universities was examined. Students were randomly assigned to participate in coaching or comparison groups. Coaching students received weekly phone-based coaching sessions and additional check-ins from the coaches. Students' learning, study, and self-regulation skills were measured by use of the Learning and Study Strategies Inventory (LASSI). The College Well-Being Scale (Field, Parker, Sawilowsky & Rolands, 2010) was used to measure participants' well-being. The coaching group had a statistically significant higher total LASSI score and statistically significant higher scores on all three LASSI clusters (i.e., Skill, Will, and Self-Regulation) than the comparison group. Well-Being scores were statistically significantly higher for students in coaching than for comparison group students, when corrected for initial differences in executive functioning. Coaching was highly effective in helping students improve their learning and executive functioning skills.

Keywords: Attention-deficit hyperactivity disorder, coaching, transition, executive functioning, subjective well-being

Difficulty with executive functioning skills is a central characteristic of Attention-Deficit/Hyperactivity Disorder (ADHD). Executive functioning is a construct that includes self-regulatory mechanisms for organizing, directing, and managing other cognitive activities, emotional responses, and overt behaviors (Gioia, Isquith, & Guy 2001). Brown (2005) described six areas of executive function, including activation (organizing and starting one's work), focus (sustaining or shifting one's attention), effort (regulating alertness and adjusting processing speed), emotions (managing frustrations and modulating intense emotions), memory (retrieving, holding, or working with information), and action (monitoring and regulation of effort). Services that help individuals with ADHD enhance their self-management skills have been recommended in recent literature, because executive functioning impairment is now believed to be the underlying cause of ADHD symptoms (DuPaul, Weyandt, O'Dell, & Varejao, 2009; Silver, 2010).

ADHD coaching is a service that has gained increasing interest as an intervention that may help individuals improve their executive functioning skills and enhance their self-regulation. (Parker & Boutelle, 2009; Quinn, Ratey, & Maitland, 2000; Swartz, Prevatt, & Proctor, 2005). Coaches use specific types of questioning with their clients to model effective executive functioning and to elicit clients' own ideas as they increase their capacity to clarify, plan, and take action on goals. Through the use of an inquiry approach, coaches endeavor to help improve a client's ability to stop, reflect, and develop more realistic plans, based on more accurate self-awareness of how they think and act. Coaches hold clients accountable for taking action to reach their goals. During the process of working toward goals, coaches and clients learn about factors that support or restrict a client's goal attainment (Quinn et al., 2000).

Because of the growing popularity of coaching despite a lack of data to support its effectiveness, Goldstein (2005) called for additional research to measure coaching's efficacy and to identify unique components of this emerging service model. In addition, Frazier, Youngstrom, Glutting, and Watkins (2007) recommended empirical investigations of coaching's ability to help college students with ADHD minimize the impact of executive functioning impairments on their academic achievement. Other researchers have also called for further examination of coaching due to the need to find non-pharmacological treatments for college students with ADHD, given the sizable percentage of individuals who do not respond to medication (DuPaul et al., 2009) and the growing reports of the abuse of stimulant medication on college campuses (Tudisco, 2010).

Although the research base on coaching is still emerging, the studies that have been conducted point toward the promise of this service to support students with ADHD to be more successful in postsecondary education. Previous studies have reported that coaching helped college students with ADHD and/or learning disabilities (LD) attain academic goals in more self-determined ways while it also reduced non-clinical levels of daily anxiety and stress (Parker & Boutelle, 2009; Zwart & Kallemeyn, 2001). Bettinger and Baker (2011) found that students who participated in coaching were more likely to persist in their academic programs while being coached and were more likely to be attending the university one year after coaching ended. Bettinger and Baker also noted that there is a need to more closely examine the coaching process to determine how it is most effective in motivating students.

The purpose of this study was to examine the effects of coaching services on the executive functioning skills and subjective well-being of students with ADHD attending 2- and 4- year colleges or universities. Coaching services were provided to students at no cost by the Edge Foundation (for more information about the Edge Foundation, see www.edgefoundation.org).

Method

Participants

Recruitment. Ten colleges and universities across the United States made the opportunity to participate available to students on their campuses who were eligible to receive accommodations based on ADHD

documentation. Participating campuses included eight 4-year institutions and two community colleges. Campus locations were geographically diverse. Both public and private institutions were included in the sample.

Students with ADHD were notified about the study by the disability services (DS) coordinator on their campus through email and personal contact, the posting of fliers, ads in student newspapers and informational meetings held on campuses. One hundred seventy students (170) from the ten participating campuses initially volunteered to participate. Because the pool of students was not known a priori, serial random assignment (Suen & Ary, 1989) was used. This permitted the focus of the study to rest on the impact of the coaching intervention. However, there was no intent to generalize study results from participants specifically back to their respective campuses.

Ten of these students either did not complete the necessary pre-test assessment instruments or chose to withdraw prior to random assignment to the coaching or comparison groups. As a result, 160 students were available to be assigned to either the treatment or comparison groups. There were slightly more males than females in the sample. The proportion of students who were from freshmen, sophomore and junior classes were quite similar. The number of students who were seniors was substantially lower than it was for the three other class levels. Specific information for gender and class level for students is provided in Tables 1 and 2.

Student Assignment to Coaching or Comparison Group. Students were randomly assigned to participate in either the coaching or the comparison group from the volunteer pool of students on a weekly basis throughout the recruitment period. Using IMSL's (2011) RNUN algorithm for random assignment, each week approximately two-thirds of the recruited students from each school were assigned to the treatment group and one-third were placed into the comparison group. Those students who were selected to participate in the coaching group were referred to the Edge Foundation to complete coaching applications and agreements and to be assigned a coach.

Of the 160 participants, 121 students were randomly assigned to the coaching group and 39 students were assigned to the comparison group. Because random assignment was used to place participants into the treatment or comparison group, it can be assumed, *ceteris paribus*, that the choice of courses (e.g., science, liberal arts), credits (e.g., 8, 10, or 12 per term), and

Table 1

Participants' Gender (Intervention and Comparison Groups Combined)

	Frequency	Percent
Female	70	43.8
Male	90	56.3
Total	160	100.0

Table 2

Participants' Year in School (Intervention and Comparison Groups Combined)

	Frequency	Percent
Freshmen	45	28.1
Sophomore	46	28.8
Junior	46	28.7
Senior	23	14.4
Total	160	100.0

level (e.g., Sophomore, Junior) have baseline equality between the two groups. This assumption was borne out by a non-significant Chi-square of primary (i.e., excluding the second of a dual major) undergraduate major designation ($\chi^2 = 66.33$, $df = 63$, $p = .36$).

Instruments

The Learning and Study Strategies Inventory ([LASSI]; Weinstein, Schulte, & Palmer, 2002) was used to assess the impact of coaching services on students' learning and study strategy skills related to executive functioning. The LASSI is a nationally normed, standardized 10-scale, 80-item assessment of

students' awareness about and use of skills and beliefs related to academic success in college. Subscale reliabilities are adequate, ranging from .75 to .90. The ten LASSI subscales are grouped into three broad clusters: Skill, Will, and Self-Regulation related to strategic learning. The focus of the LASSI scales is on both covert and overt thoughts, behaviors, attitudes, and beliefs that relate to successful learning that can be altered through educational interventions (Weinstein, Schulte, & Palmer, 2002).

According to Weinstein, Schulte, and Palmer (2002), the focus of the three Skill cluster subscales (i.e., Information Processing, Selecting Main Ideas,

and Test Strategies) is on students' learning strategies, skills, and thought processes related to identifying, acquiring, and constructing meaning. They add that the Will cluster (i.e., Attitude, Motivation, and Anxiety subscales) measures students' receptivity to learning new information, their attitudes and interest in college, their diligence, self-discipline, and willingness to exert the effort necessary to successfully complete academic requirements, and the degree to which they worry about their academic performance. Finally, they state that the Self-Regulation cluster (i.e., Concentration, Time Management, Self-Testing, and Study Aids subscales) assesses how students manage, or self-regulate and control, the whole learning process through using their time effectively; focusing their attention and maintaining their concentration over time; checking to see if they have met the learning demands for a class, an assignment or a test; and using study supports such as review sessions, tutors, or special features of a textbook. The scales are comprised of items to which students respond on a five point scale (i.e., Not at all typical of me, Not very typical of me, Somewhat typical of me, Fairly typical of me, or Very much typical of me). Sample items include "I feel confused and undecided as to what my educational goals should be" (Attitude scale) or "Worrying about doing poorly interferes with my concentration on tests" (Anxiety scale).

The College Well-Being Scale ([CWB]; Field, Parker, Sawilowsky, & Rolands, 2010) was used to measure participants' perceptions of factors associated with well-being for students in postsecondary education. The CWB Scale includes ten items related to well-being. Students respond to each of these items on a likert-type scale of one (never) to five (always) to indicate the degree to which the item is reflective of their experience.

Coaching Intervention

Students received coaching at no cost through the Edge Foundation for a period of approximately six months. All of the participating coaches completed life coach training through an International Coach Federation (ICF) approved program (www.coachfederation.org) and the Edge Coach training program. They also had a minimum of two years of coaching experience.

The coaching model was designed to provide a two hour intake (which could be conducted over multiple sessions) and one half-hour session per week between coach and student conducted by telephone for 24

weeks. The model also provides for email and phone check-ins by coaches and students between regular weekly sessions on an as-needed basis. An overview of the model for coaching services is provided below:

Edge coaches work with students in seven major areas: scheduling, goal setting, confidence building, organizing, focusing, prioritizing, and persisting at tasks. They help students assess their environments, identify needs, set goals, and offer suggestions and guidance. Coaches also set structure, provide support, and help implement strategies for skill building. Edge coaches teach and foster appropriate social skills, self-discipline, self-reliance, and self-advocacy... The coach does not control the plan. The coach supports and monitors the success of the plan. (Edge Coaching Model protocol, 3/12/09).

Specific steps in the coaching process used in the study are provided below:

1. Enrollment Phase
 - Prospective client completes online enrollment form with its brief prescreening.
 - Prospective client receives additional information from Edge Foundation.
 - Prospective client may receive an enrollment/prescreening call from Edge Foundation.
 - Prospective client is given name/contact information for a coach and vice versa.
2. Prescreening Phase (initial phone contact between coach and prospective client)
 - Coach asks questions to ascertain coaching readiness, understanding of the coaching process, preparedness to engage in the coaching process, and to determine areas of concern/interest for coaching.
 - Prospective client is encouraged to ask questions of the coach regarding the coaching process, what coaching will "look" like, measures of progress, confidentiality, time, etc. This is the time for the client to make sure they feel comfortable with the coach.
 - If, after the prescreening call the client wishes to speak with additional coaches,

they simply contact Edge Foundation and ask. They then conduct a prescreening call with each coach in turn.

3. Contracting Phase
 - Coach sends the new client the coaching contract and startup forms via email.
 - Client is to return the completed contract and startup forms to the coach prior to the initial session.
4. Initial Session (one 2-hour session or two 1-hour sessions)
 - Design of Personal Coaching Agreement - this is a goal directed action plan developed with the client. The client sets the goals after discussion with the coach to determine if each goal is reasonable and attainable. The GROW model of goal setting (Whitmore, 2002), use of SMART goals (i.e., Specific, Measurable, Attainable, Realistic, Timely), or similar processes may be used by the coach to assist the client in goal setting. Action steps are developed so that the client can see the steps needed to reach the goal. For example: The goal is to achieve a 3.0 GPA. Action steps might include: block out 2 hours of study time twice a day away from distractions.
 - Discussion of Coaching Plan – meeting weekly for 30 minutes by phone at the same time every week (coach and client will choose their time) with additional check-ins via email/voice mail/text messages/phone up to 7 days/week (mode and frequency designed with client).
5. Regular coaching sessions (30-minute phone sessions)
 - Client calls coach at agreed upon coaching time (same day/time each week).
 - Client leads the process – here is what I want to focus on in coaching today, progress report of the past week, questions for the coach, etc.
 - Coach follows the client's lead. There is an agreement between the client and the coach that if the client goes off on a

tangent unrelated to the coaching goals set forth, the coach has permission to remind client of the plan set in motion during the initial session or at the last coaching call. The coach asks the client how s/he would like to proceed. Most clients appreciate the refocusing and choose to either go back to that plan or proceed on a new path. At times the new path is one of discovery, which takes the client back to the coaching goals with a clearer sense of direction and purpose.

The Edge Foundation administration and JST Coaching, the contractor for design and implementation of coaching services, had primary responsibility for overseeing delivery of the coaching intervention. Edge and JST Coaching staff worked with coaches to assure that the coaching strategy was implemented according to the model, and that training and supervision was provided to coaches.

The following procedures were developed to assure implementation of coaching services were consistent across coaches and participants. First, a detailed protocol for the coaching model was developed. In addition, a system for regular coach reporting on provision of services was developed. This included bi-weekly reporting during the first month of service provision and monthly reporting throughout the study. An electronic listserv and a regular conference call schedule were established to provide for on-going communication between the Edge Executive Director, the Edge Training Director, and the coaches. In addition, the Edge Executive Director and the Edge Training Director were available for on-call assistance as needed.

Data Collection

Pre-test Data: Treatment and Comparison Groups. Data collection plans were established for participating students and for each participating campus. All students submitted both a student information form and an informed consent form to the DS provider on their campus when they volunteered to participate. Students independently provided their responses for the pre-test of the LASSI via a secure section of the H & H Publishing website created for this study. Most students completed the LASSI on a computer in the DS office at the time they returned their informed consent

and student information forms. However, some students stated that they preferred to complete the LASSI on their own at a later time. Students were not included, either in the treatment or the comparison group, if they did not complete all of the pre-test instruments (e.g., student information form, LASSI, and informed consent).

Post-test data: Comparison group. The research team maintained repeated communication with students in the comparison group throughout the duration of the study. Two weeks after the Spring break on each campus, comparison group participants were asked to complete the LASSI post-test and the CWB Survey on-line. A system of regular reminders by phone, email, and texting was established to follow-up with students who needed reminders to complete the post-test surveys.

Post-test data: Treatment group. Requests to complete the LASSI post-test and the CWB Survey were sent to all coaching group participants two weeks after their Spring breaks in the same manner described above for the comparison group. In addition, a request was made to students' coaches to remind them to complete the post-test instruments. Follow-up reminders were provided by the research team in the same manner that they were for the comparison group.

Data Analysis

Data were entered into an EXCEL file on a contemporaneous basis (i.e., data were entered upon receipt in the research office rather than a single entry at one point in time). When the data collection period was concluded, the data were then ported to SPSS v. 18 which contained test scores and descriptive data for $N = 160$ participants.

First, instrument reliability studies were conducted on the LASSI and CWB instruments. Next, descriptive statistics were computed for all dependent variables. Finally, in order to examine each of the research questions, statistical hypothesis tests were conducted at the 0.05 nominal alpha level. Underlying assumptions (e.g., normality and homoscedasticity) were checked prior to conducting classical parametric tests.

Results

Note: Results on several different instruments and subscales are provided within this section. The number of participating students will vary for each instrument and subscale depending on the number of students who provided usable data for each analysis. For example,

if a student did not complete all of the responses for one LASSI scale, but provided complete responses for another scale, the total N for each of those measures will be different.

Fidelity of Treatment

Fidelity of treatment measures allow valid comparisons of group data by ensuring that a comparable intervention (treatment) is being provided by a number of individuals. Given the use of multiple coaches, it was important to ensure that participating students essentially received a comparable coaching intervention regardless of who coached them even though the coaching model becomes individualized in practice. Fidelity of treatment was assessed through two methods. Coaches submitted a monthly log of services for each participant to whom they provided services. Information requested from coaches for the logs included number and duration of intake sessions, number and duration of coaching sessions, and number and type of coach/client check-ins between sessions.

Eighty-eight of the 121 students referred to Edge to participate in the treatment (coaching) group completed the application process, intake sessions, and at least one coaching session. Table 3 provides a summary of data obtained through the coaching logs for these students. The breakdown of sessions/minutes, with their respective frequencies and percents, are compiled in Table 3.

The number of students who received intake and at least one coaching session was $N = 88$. The average number of coaching sessions completed was 16.5 (69%). This translated into an average of 527.4 minutes of coaching, which is sufficiently robust for the results to be significant.

The coaching services provided were consistent with the coaching model delineated in the protocols. Students participated in weekly sessions of about 30 minutes in length conducted by telephone or, in a few cases, Skype. Email and texting check-ins between students and coaches were provided as needed. The coaching sessions were based on goals identified by the students. Coaches provided support to students as they identified and worked toward goals that were important to them. The development of executive functioning skills within this framework was frequently emphasized.

Fidelity of treatment was also assessed through interviews with participants. A purposive sample of twenty students was selected from the ten schools.

Table 3

Coaching Services per Coaching Log Data

Percent of Planned Treatment Sessions Completed	Number of Sessions	Number of Students	Percent of Students
<25%	1-5	12	13.6
25% < 50%	6-11	10	11.4
50% < 75%	12-17	16	18.2
75% < 90%	18-21	19	21.6
>90%	22-24	31	35.2
Total		88	100.0

Percent of Planned Treatment Minutes Completed	Number of Minutes	Number of Students	Percent of Students
<25%	1-179	13	14.8
25% < 50%	180-359	9	10.2
50% < 75%	360-549	13	14.8
75% < 90%	540-657	14	15.9
>90%	648+	39	44.3
Total		88	100.0

One male and one female student from each school who scored below the median on the LASSI Self-regulation cluster (which is the at-risk threshold) were identified. One student with a cumulative grade point average (GPA) at or above 3.0 as well as one student below this criterion was identified on each campus when possible to participate. There was one no-show, so interviews were collected on 19 students. During these interviews details regarding the treatment were discussed in order to document its fidelity. For further discussion on those interviews, which also served as part of a qualitative study to enrich knowledge on coach-student interactions, see Parker, Field, Sawilowsky, and Rolands (2012).

Interviewees were asked (a) how frequently they spoke with their coaches and for what length of time; (b) the type of communication they used to communicate with their coaches (e.g., phone, email, Skype); and (c) the estimated frequency and type of check-in (e.g., email, texting, phone) between coaching sessions. Interview results indicated that coaching was provided in a manner consistent with the coaching protocol. Sessions took place approximately once per week and were approximately 30 minutes in length. They typically occurred via phone with email or text check-ins between sessions.

Instrument Reliability

It is important to assess reliability of a nationally normed instrument with the study participants (Sawilowsky, 2000, 2002). Reliability is defined as the consistency of scores, which can be obtained through repeated measures (e.g., test-retest), or in situations such as the current study, internal consistency. Cronbach alpha, a measure of internal consistency, was computed on the LASSI subscales. Internal consistency is equivalent to the correlation obtained when splitting the test into two random parts. A value of .8 is generally considered adequate. The subscale reliabilities for the LASSI were quite good (e.g., often above .9); They are compiled in Table 4.

Impact of Coaching on Students' Executive Functioning

A multivariate analysis of covariance (MANCOVA) was conducted on the LASSI total scores to determine if there were mean differences between the Coaching and Comparison students. The LASSI pretests served as the covariates.

The results depicted in Figure 1 indicate a statistically significant higher LASSI score for students who were coached as compared to those who did not receive coaching (Hotelling's Trace = .085, $F = 2.73$, $df = 3$, 96 , $p = .048$). When taking the entire LASSI score as a single multivariate variable, the Coaching students' scores were superior to the comparison group.

The question of differences between the Coaching and Comparison students also arises on the individual LASSI cluster scores, as depicted in Figure 2. Therefore, univariate analysis of covariance (ANCOVA) breakdown tests and their estimated effect sizes are noted below. An effect size is a standardized measure of (a) impact of an intervention, or (b) difference in outcomes between two or more groups. The effect size, Partial Eta², is used to assess the practical significance if a hypothesis test is found to be statistically significant. It was found that students who were coached scored statistically significantly higher ($p < .05$) on each of the individual LASSI clusters with effect sizes that were typically moderate or large. Skill ($F = 4.33$, $p = .04$, Partial Eta² = .04) and Will ($F = 4.58$, $p = .04$, Partial Eta² = .05) are approximately designated as a moderate treatment outcome, whereas Self-Regulation ($F = 8.35$, $p = .01$, Partial Eta² = .08) is a large treatment outcome of the coaching intervention.

Within Group Analyses of Executive Functioning

According to Cohen (1988), effect sizes for differences between two groups can be classified as .2 = small, .5 = moderate, and .8 = large. Sawilowsky (2009) defined effect sizes of 1.2 and 2.0 as very large and huge, respectively. The coached students' pre-test to post-test gains on the LASSI were analyzed. The mean total LASSI pre-test score was 236.93, whereas the mean post-test LASSI score increased to 419.61, as indicated in Figure 1. A dependent samples t-test was statistically significant ($t = 8.51$, $df = 78$, $p < .01$). The effect size for the coached students gain in total LASSI score was $d = 1.02$, which is large.

Figure 1 also provides a view of the pre- to post-gain of the comparison group. Their total LASSI scores improved from 304.95 to 369. However, the paired samples t-test was not statistically significant ($t = 1.763$, $df = 36$, $p = .09$).

The treatment group also demonstrated gains on all three clusters of the LASSI. As noted in Figure 2, the mean scores improved for Skill from 75.98 to 133, Will from 79.12 to 130.5, and Self-Regulation from 81.8 to 156.08. A series of two dependent samples t-tests were conducted on the pre-test to post-test gain for each of these LASSI cluster scores. The results were as follows: Skill ($t = 7.63$, $df = 78$, $p < .01$), Will ($t = 6.11$, $df = 78$, $p < .01$), and Self-Regulation ($t = 9.13$, $df = 78$, $p < .01$). The effect sizes were: Skill, $d = .88$, which is large; Will, $d = .65$, which is moderate-large, and Self-Regulation, $d = 1.10$, which is large. (Because the pretest to posttest total gain was not statistically significant for the Comparison group, breakdown pretest to posttest analyses based on the three LASSI cluster scores are not presented for the Comparison group.)

In addition to the quantitative results obtained on growth pre- to post- in executive functioning skills for students who were coached, the improvement in these skill areas was a major qualitative theme that emerged from interviews with a purposive sample of students in the coaching group. See Parker, Field, Sawilowsky, and Rolands (2012) for a comprehensive review of the qualitative aspects of this study.

Impact of Coaching on Subjective Well-Being

The CWB Scale was developed by project staff to assess specific factors associated with the subjective well-being of college students. Subjective well-being refers to how people evaluate their lives and what is important to them. An individual's subjective well-

Table 4

Cronbach Alpha Reliability for LASSI Total Scale and Ten Subscales; Coaching n = 79, Comparison n = 38

	Coached		Comparison		Combined	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Total Scale	.94	.95	.94	.94	.94	.95
<i>Subscales:</i>						
Anxiety	.84	.87	.86	.76	.84	.84
Attitude	.67	.75	.53	.69	.64	.73
Concentration	.84	.86	.90	.88	.87	.87
Information Processing	.82	.81	.78	.78	.81	.80
Motivation	.83	.84	.74	.77	.82	.82
Self Testing	.84	.84	.76	.86	.88	.89
Selecting Main Ideas	.87	.91	.89	.86	.88	.89
Study Aids	.72	.73	.62	.65	.70	.70
Time Management	.81	.85	.75	.85	.80	.85
Tests Strategies	.71	.75	.80	.76	.74	.75

Figure 1. LASSI Pre- and Post-test Results Total Scores

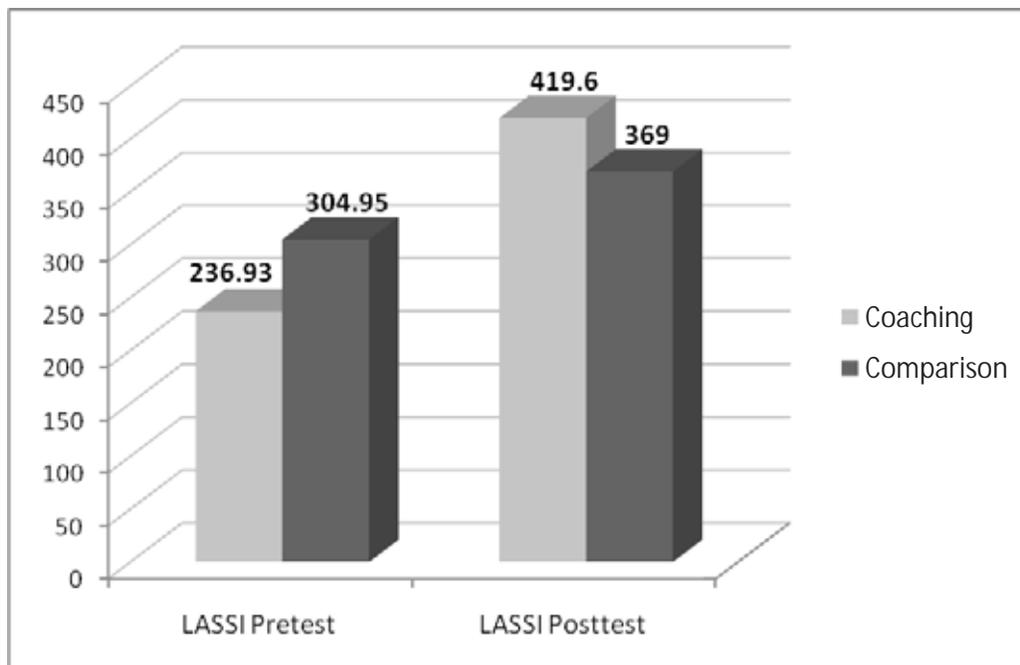


Figure 2. LASSI Pre- and Post-test Results Cluster Scores

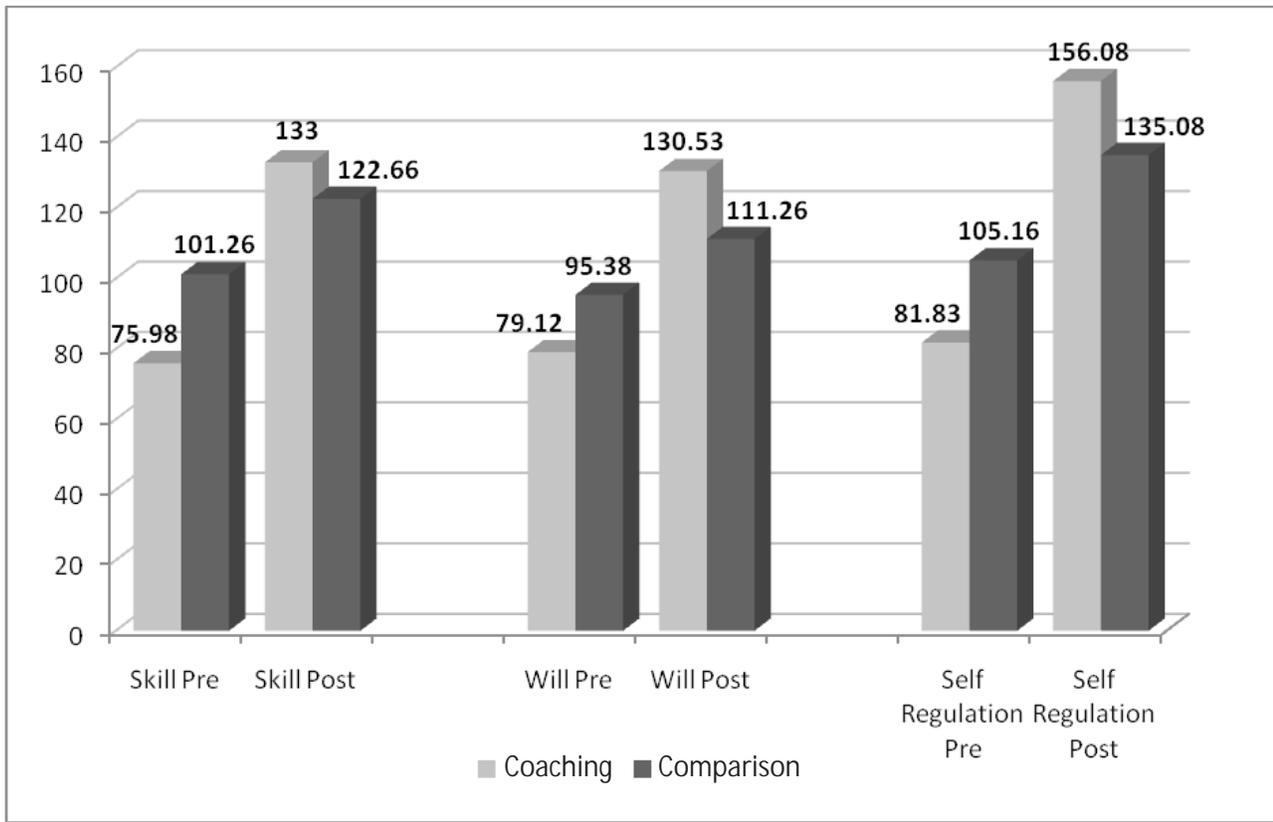


Table 5

College Well-Being Rotated Component Matrix

	Component	
	Well-Being	Life Direction
CWBS Q8	.780	
CWBS Q5	.759	
CWBS Q1	.635	
CWBS Q4	.589	
CWBS Q7	.571	
CWBS Q2	.537	
CWBS Q6	.527	
CWBS Q10		.873
CWBS Q9		.803
CWBS Q3		.557

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

being is often related to some degree to their objective circumstances, but it also depends on how people think and feel about these conditions. Subjective well-being encompasses people's life satisfaction and their evaluation of important domains of life such as work, health, and relationships. It also includes their emotions such as joy and engagement, and the relatively rare experience of unpleasant emotions such as anger, sadness, and fear (Diener & Biswas-Diener, 2008, p. 4).

Items were written based on literature links to well-being as a construct and then tailored to college students. The literature links to well-being as a construct that provided the foundation for item development included positive feelings (Fredrickson & Losada, 2005; Seligman, 2002), ability to identify and access resources (Field & Hoffman, 1994), life balance (Baker, 2003), time management (Field & Hoffman, 1994), and purpose (Baker, 2003).

The CWB Scale was administered post-test only to the coaching and comparison groups. Cronbach alpha, a measure of internal consistency reliability, was .84 for the coaching group and .83 for the comparison group. Exploratory factor analysis was conducted to assess CWB validity via internal factor structure. Principal components extraction with varimax rotation produced two factors as indicated in Table 5. The total variance explained was 52.9%. The two factor solution included all of the general well-being items, which are therefore named "well-being," and three items that pertain to life direction.

To determine the difference in college well-being between students who were coached and comparison group students, an ANCOVA was conducted. The total LASSI score served as a covariate to statistically create baseline equivalence on executive functioning. The ANCOVA results are compiled in Table 6. The result ($p = .05$) is statistically significant. Coached students' mean well-being score was statistically significantly higher than comparison students' mean well-being score, when corrected for initial differences in executive functioning.

The practical significance is depicted by the R^2 effect size. The value of .11 indicates that approximately 1/10th of the reason students' well-being score differs can be explained by the executive functioning (i.e., LASSI score).

Impact of Co-Occurring Conditions on Study Results

Many students with ADHD also have one or more

co-occurring conditions (Weyandt & DuPaul, 2006; Wolf, 2001). Therefore, it is important to examine whether the existence of co-occurring conditions had an impact on any of the results. At the beginning of the study, students provided information about the existence of any co-occurring conditions on a self-report basis on their enrollment forms. An analysis was conducted on a variety of dependent variables in a one-way ANOVA where the independent variable was condition. "Condition" was defined as being diagnosed with ADHD only (Condition 1) or with ADHD and at least one other condition (Condition 2). The second condition included depression, anxiety, learning disability, Obsessive Compulsive Disorder, Oppositional Defiant Disorder, Tourette's Syndrome, Aspergers/Autism, or Bi-polar Disorder. There were no statistically significant differences found based on ADHD only (Condition 1) vs. ADHD with an additional diagnosis (Condition 2), except for the LASSI Self-Regulation cluster post-test scores ($p = .046$), as noted in Table 7. Hence, the existence of co-occurring conditions did not appear to have a major influence on the efficacy of the coaching services.

Discussion

Students who participated in coaching demonstrated statistically significant higher executive functioning, as measured by the LASSI cluster scores (i.e., Will, Skill, and Self-Regulation), compared to the comparison students ($p < .05$). Further, an inspection of effect sizes indicated moderate to large treatment outcomes. Analysis of the interviews conducted with students who participated in the coaching model corroborated the LASSI findings (Parker, Field, Sawilowsky, & Rolands, 2012). Students expressed that coaching helped them think about and work toward their goals more productively. A major theme throughout the interviews was the impact that coaching had on students' perceptions of their self-regulated behaviors. A majority of students noted that coaching had helped them manage their time and tasks more efficiently and that it had resulted in more positive self-talk. They stated that the improved self-talk led to better management of time and tasks, more effective problem solving, and the lessening of self-doubts and worries. Clearly, the students' perceptions indicated that the coaching intervention improved their ability to self-manage the learning process. As students participated in coaching, they noted improved executive functioning skills, es-

Table 6

ANCOVA on College Well-being with LASSI as a Covariate, Coaching n = 78, Comparison n = 35

Source	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Corrected Model	396.12 ^a	2	198.06	6.48	.00
Intercept	29553.98	1	29553.98	966.59	.00
LASSI Pretest	349.73	1	349.73	11.44	.00
Group	109.24	1	109.24	3.57	.05
Error	3363.31	110	30.58		
Total	167540.00	113			
Corrected Total	3759.43	112			

Notes: R2 = .11, Adjusted R2 = .09.

Table 7

Impact of Co-occurring Conditions by LASSI Cluster Posttest Score

		Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Skill	Between Groups	24491.548	5	4898.310	1.186	.328
	Within Groups	231367.936	56	4131.570		
	Total	255859.484	61			
Will	Between Groups	49455.585	5	9891.117	1.898	.109
	Within Groups	291882.609	56	5212.189		
	Total	341338.194	61			
Self-Regulation	Between Groups	68593.629	5	13718.726	2.431	.046
	Within Groups	316016.064	56	5643.144		
	Total	384609.694	61			

pecially their self-regulation, including organizational and time management skills.

Given the importance of executive functioning skills (especially self-regulation) to success in academic and vocational pursuits, the implications of these findings are substantial. This is especially pertinent given the centrality of difficulty related to executive function and self-regulation for persons with ADHD.

It was also demonstrated that coaching enhanced students' sense of well-being when self-regulation was used as a control. As indicated above, student interviews revealed participants in the intervention group experienced a greater sense of well-being after having received the coaching services. See Parker, Field, Sawilowsky, and Rolands (2012) for further discussion of the student interviews.

Given the dramatic increase in perceived self-regulation demonstrated as a result of coaching, the relationship found between enhanced well-being and increased self-regulation is an important finding. Not only is enhanced subjective well-being important for quality of life; research has also demonstrated positive emotional states are linked to more effective and efficient learning (Fredrickson & Branigan, 2005). For persons with ADHD this finding takes on added importance in light of Gudjonsson, Sigurdson, Eyjolfsdottir, Smari, and Young (2009) who found an association between ADHD symptoms and reduced global life satisfaction. Although the research in this area is not conclusive, it appears that persons with ADHD may be at higher risk for diminished life satisfaction. Wilmshurst, Peele, and Wilmshurst (2011) found that environmental mastery (i.e., competence in managing the environment, making effective use of available opportunities) was predictive of positive self-concept in persons with ADHD. By assisting students with ADHD in the improvement of their self-regulation, coaching may also help students experience more positive emotions and, subsequently, the ability to learn more effectively.

Coaching appears to successfully address the very difficulties that college students with ADHD report in the literature, specifically difficulty in the area of executive functioning, including such areas as time management, task organization, self-regulation, and stress management. The finding that a phone-based, weekly service made such a difference in students' perceptions about their functioning is likely to be very meaningful to college campuses, where typically staff must explore effective services for academically at-

risk students in an era of diminished budgets. While some colleges and universities train DS providers or other campus professionals in coaching techniques, other campuses find it more useful to refer students to off-campus coaching services that appear to be efficacious (Parker & Boutelle, 2009). In addition, a phone/email/text-based service with such measurable benefits has a potentially high appeal to a wide range of college students in this era of ubiquitous personal technology usage.

There are several limitations to this study. Information was not collected on students' ADHD subtype or medication usage. In addition, although all students in both treatment and comparison groups had access to the disability support services available on their campuses, information was not collected on the types of services they chose to access. More detailed information about students' ADHD subtype and medication usage, as well as types of support services used in addition to coaching, may help to identify the circumstances under which coaching is most beneficial for college students with ADHD. Another potential limitation is that, despite an impressive number of students in the sample, a sizeable group of initial participants did not complete the study. There is a need for further research to examine the factors that are linked to students' inability to complete coaching programs. This would provide valuable information on the factors that contribute or hinder adherence to coaching and may also lead to increased understanding of conditions that make coaching most useful.

This study demonstrated that participation in coaching made significant improvements for students with ADHD in their perceptions of will, skill, self-regulation, and well-being. This investigation has established a foundation for further research, such as an analysis of the incremental improvements per unit of coaching (e.g., sessions, minutes), to determine the most cost- and time-efficient method to deliver coaching services. Furthermore, there is a need to identify readiness factors that make some students more likely to benefit from coaching services. It would be valuable to compare different methods of coaching services delivery (e.g., phone vs. in-person, individual vs. group). Finally, with larger samples, a breakdown analysis by co-morbidity may be helpful in maximizing the effects of coaching outcomes to meet the needs students with additional, specific disabilities.

References

- Baker, D. (2003). *What happy people know*. New York: Rodale.
- Brown, T. E. (2005). *Attention deficit disorder: The unfocused mind in children and adults*. New Haven, CT: Yale University Press.
- Bettinger, E., & Baker, R. (2011). *The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring (working paper 16881)*. Cambridge, MA: National Bureau of Economic Research.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Diener, E., & Biswas-Diener, R. (2008). *Happiness: Unlocking the mysteries of psychological wealth*. Malden, MA: Blackwell Publishing.
- 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.
- Field, S., & Hoffman, A. (1994). Development of a model for self-determination. *Career Development for Exceptional Individuals, 17*(2), 159-169.
- Field, S., Parker, D., Sawilowsky, S., & Rolands, L. (2010). *College well-being scale*. Detroit, MI: Wayne State University College of Education.
- 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.
- Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition and Emotion, 19*, 313-332.
- Fredrickson, B. L., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychologist, 60*, 678-86.
- Gioia, G. A., Isquith, P. K., & Guy, S. C. (2001). Assessment of executive function in children with neurological impairments. In R. Simeonsson & S. Rosenthal (Eds.). *Psychological and developmental assessment* (pp. 317-356). New York: Guilford Press.
- Goldstein, S. (2005). Coaching and ADHD: Myths, realities and controversies. *Journal of Attention Disorders, 9*, 379-381.
- Gudjonsson, G. H., Sigurdsson, J. F., Smari, J., & Young, S. (2008). The relationship between satisfaction with life, ADHD symptoms, and associated problems among university students. *Journal of Attention Disorders, 12*, 507-515.
- IMSL (2011). Visual Numbers, v. 70. Retrieved from http://www.roguewave.com/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=517&PortalId=0&TabId=607 (p. 99).
- Parker, D. R., & Boutelle, K. (2009). Executive function coaching for college students with LD and ADHD: A new approach for fostering self-determination. *Learning Disabilities Research & Practice, 24*(4), 204-215.
- Parker D., Field, S., Sawilowsky, S., & Rolands, L. (2012). Self-control in postsecondary settings: Students' perceptions of ADHD college coaching. *Journal of Attention Disorders*, doi:10.1177/1087054711427561.
- Quinn, P. O., Ratey, N. A., & Maitland, T. L. (2000). *Coaching college students with AD/HD: Issues and answers*. Silver Spring, MD: Advantage Books.
- Sawilowsky, S. (2000). Psychometrics vs. datametrics. *Educational and Psychological Measurement, 60*, 157-173.
- Sawilowsky, S. (2002). Reliability. In (B. Thompson, Ed.) *Score reliability: Contemporary thinking on reliability issues*. Thousand Oak: Sage.
- Sawilowsky, S. (2009). New effect size rules of thumb. *Journal of Modern Applied Statistical Methods, 8*(2), 597-599.
- Seligman, M. E. P. (2002). *Authentic happiness*. New York: Free Press.
- Silver, L. B. (January/February 2010). The concept of ADHD is changing. How does this impact on you or your child? *LDA Newsbriefs, 45*(1), 17-20.
- Suen, H. K., & Ary, D. (1989). *Analyzing quantitative behavioral observation data*. Hillsdale, NJ: Erlbaum.
- 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.
- Tudisco, R. M. (2010, June). The diversion of ADHD medication: What you need to know. *Attention, 17*(30), 16-19.
- Weinstein, C. E., Schulte, A. C. & Palmer, D. R. (2002). *Learning and Study Strategies Inventory*. Clearwater, FL: H and H Publishing.
- Weyandt, L. L., & DuPaul, G. (2006). ADHD in college students. *Journal of Attention Disorders, 10*(1), 9-19.

- Wolf, L. E. (2001). College students with ADHD and other hidden disabilities: Outcomes and interventions. *Annals of The New York Academy of Sciences*, 931, 385-395.
- Whitmore, J. (2002). *Coaching for performance*. London: Nicholas Brealey Publishing.
- Wilmshurst, L., Peele, M., & Wilmshurst, L. (2011). Resilience and well-being in college students with and without a diagnosis of ADHD. *Journal of Attention Disorders*, 15(1), 11-15.
- 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.

Shlomo S. Sawilowsky received a Ph. D. from the University of South Florida in Educational Statistics, Measurement, Research, and Evaluation. He is a Wayne State University Distinguished Faculty Fellow and Professor of Evaluation and Research in the College of Education. His research interests are in the development of robust and powerful social and behavioral science statistics; including nonparametric and computer-intensive Monte Carlo methods. His email address is shlomo@wayne.edu.

Laura Rolands received her BA degree in business administration from Michigan State University and Masters in Industrial and Labor Relations from Cornell University. Her experience includes working as a human resources executive with Chrysler Corporation and as a research assistant at Wayne State University. She is currently an ADHD Coach and a Director with Ulliance, Inc. Her research interests focus on ADHD and coaching. She can be reached by email at: Laura@MyAttentionCoach.com

About the Authors

Sharon Field received her BA degree in Sociology from University of Washington, her M.S. degree from University of Wisconsin-Whitewater and Ed.D. from University of Washington. Her experience includes working as a special education teacher and coordinator for Bellevue School District (Bellevue, WA) and as a professor of Educational Leadership and Associate Dean for Research for the College of Education at Wayne State University (Detroit, MI). She is currently Co-Director of the Initiative for Self-Determination, College of Education, Wayne State University. Her research interests focus on self-determination across the lifespan and application of positive psychology practices. She can be reached by email at: sharon.field@wayne.edu.

David R. Parker received his BS degree in special education and MS in counseling from Indiana University and his Ph.D. in special education (postsecondary programming) from the University of Connecticut. He has been a high school special education teacher, LD specialist/ADHD coach and administrator at UNC Chapel Hill, director of the UPLD program and special education faculty member at the University of Connecticut, and program manager of an NSF STEM grant at Washington University in St. Louis. His research interests include ADD coaching, self-determination theory and practice, and applications of Universal Design for Instruction (UDI). He can be reached by email at: drdparker@gmail.com.

Authors' Note

This research was supported in part by a grant from the Edge Foundation. We would like to acknowledge the assistance of Julie Smith in the preparation of this manuscript.

