

# Journal of Postsecondary Education and Disability

Volume 27(1), Spring 2014

JOURNAL OF POSTSECONDARY EDUCATION AND DISABILITY • VOLUME 27(1) • Spring 2014 • Pages 1 - 108

# Journal of Postsecondary Education and Disability

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## FROM THE EDITOR

### DAVID R. PARKER

JPED began life as the *AHSSPE Bulletin* during the origins of AHEAD in 1983. As the Journal launches its 30th year, we celebrate the evolution of knowledge, beliefs, and practices regarding postsecondary education and individuals with disabilities. One important example of that growth is the refinement of evidence-based practices that measure what we know about students with non-apparent disabilities and the impact of our work with them. This initial issue of 2014 includes seven research articles and a book review related to this theme.

The first five articles focus on students with executive functioning (EF) disorders. Research by Russell Barkley, Thomas Brown and others in the 1990s helped shift the behavioral paradigm of ADHD to that of an executive functioning framework. Soon thereafter, Harbour (2004) was one of the first researchers to document the rapid emergence of postsecondary students with ADHD. Yet, the EF framework also includes students with LD, psychiatric disorders, and perhaps a wider range of disabilities than is currently understood. Campuses continue to explore effective ways to document and mitigate the myriad functional limitations that can arise in students when postsecondary environments place newly intense demands on their EF skills.

In the first article, Gaultney investigated 1085 college freshmen to explore any impact that ADHD and/or LD had on undergraduates' sleep habits and academic success. Participants with ADHD were at greater risk for sleep disturbance. Both ADHD and insomnia were found to predict lower GPA. This study has implications for wellness programs and the pharmacological treatment of students with ADHD during their transition to college.

A growing number of researchers use the *BRIEF-A* (Roth et al., 2005) as a data collection tool. Grieve, Webne-Behrman, Couillou, and Sieben-Schneider studied 50 undergraduates with ADHD and other disabilities to document EF issues based on year in college, disability type, and other variables. Students with ADHD and/or psychiatric disabilities, as well as older students, were found to have more significant EF difficulties particularly in the area of metacognition. Read how the authors used the *BRIEF-A* to better understand students' needs and to identify services designed to can address them.

Research on the impact of ADD coaching continues to expand. Richman, Rademacher, and Laurie Maitland embedded a case study into their mixed methods investigation of ethnically diverse undergraduates and graduate students who received campus-based coaching. Participants' insights about the impact of this emerging model on their self-determination help close several gaps in the coaching literature. JPED expresses its appreciation to Dr. Manju Banerjee, who oversaw all stages of this article's peer reviewed process.

Mytkowicz, Goss, and Steinberg used the *Metacognitive Awareness Inventory* ([MAI]; Schraw & Dennison, 1994) to investigate the impact of a strategic learning course on the metacognitive growth of first year college students with LD and/or ADHD. This tool allowed the researchers to document a rise in participants' self-awareness and regulation, which was significantly correlated to their GPA's. Read more about this transition course and how the MAI was used to measure students' metacognitive outcomes and to evaluate the program's overall efficacy.

Longtin synthesized an overview of college programs for students on the autism spectrum disorder (ASD). Like students with ADHD in the last decade, students with Asperger's and related forms of ASD now represent a growing segment of postsecondary students with disabilities. While more is known about the social, communication, and behavioral barriers students with ASD can encounter, Longtin explored the underlying executive functioning challenges that contribute to these issues. Read more about a range of campus resources that can help students level these related playing fields.

Despite many gains in postsecondary access for individuals with disabilities, Myers, MacDonald, Jacquard, and Mcneil used a "storying process" to depict the persistence of disabling attitudes and practices. This unique, first-person article explores issues at a Canadian university that could no doubt be reported in the U.S. and other countries. Read a graduate student's perspective on attitudinal and policy-based barriers and her efforts to create accessible educational experiences.

Over the past 30 years, the literature has included a growing number of articles about diverse subgroups of postsecondary students with LD such as ethnic minori-

ties, women, students at highly selective institutions, and those seeking admission into graduate/professional school programs. In the final research article, May and Stone offer intriguing insights into all of these issues. They studied the impact of “stereotype threat” on the performance of undergraduates with LD taking GRE practice tests. Read their data-based interpretation of why these participants actually needed more time on this high stakes test.

Finally, Longtin contributes a second manuscript to this issue with her review of *Scholars with Autism Achieving Dreams* (edited by Lars Perner, 2012). While much is known about Dr. Temple Grandin, this book introduces readers to seven other successful adults with advanced degrees who happen to have high functioning autism. Longtin provides an overview of the biographies presented in this book and discusses how each enriches our understanding of the uniqueness – and commonalities – of individuals on the spectrum who have attained significant levels of academic achievement.

May these articles provide insight and inspiration as our field continues its exciting growth.

# College Students with ADHD at Greater Risk for Sleep Disorders

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## Abstract

The pediatric literature indicates that children with ADHD are at greater risk for sleep problems, daytime sleepiness, and some sleep disorders than children with no diagnosed disability. It has not been determined whether this pattern holds true among emerging adults, and whether comorbid sleep disorders with ADHD predict GPA. The present study used a validated survey to screen 1085 freshmen college students for risk for sleep disorders, sleepiness, and sleep patterns. Risk for a sleep disorder among those who had been diagnosed with ADHD or a learning disability (an additional control group with a different disability) were compared to students without a diagnosed disability. Students with ADHD were at greater risk for insomnia and restless legs syndrome/periodic limb movement disorder. Both an ADHD diagnosis and risk for insomnia or a circadian rhythm disorder predicted lower GPA, but the two predictors did not interact. Implications of the associations of ADHD and risk for sleep disorders among emerging adults are discussed.

*Keywords:* Sleep disorder, college students, ADHD, insomnia, PLMD/RLS

Children with ADHD, symptoms of ADHD, or conduct problems are more likely to have disrupted sleep (Owens, 2009), shorter sleep duration (Touchette et al., 2007), and are at greater risk for some sleep disorders (e.g. Owens, Maxim, Nobile, McGuinn, & Msall, 2000). The findings are mixed, with some studies finding little association of sleep problems with ADHD (e.g. Hansen, Skirbekk, Oerbeck, Richter, & Kristensen, 2011), while others do find associations with sleep disorders (e.g. Picchietti, England, Walters, Willis & Verrico 1998). A few studies have found ADHD-related differences in polysomnography-measured characteristics of sleep (such as increased limb movement during sleep; Sadeh, Pergamin, & Bar-Haim, 2006), while others find few or no objective differences in sleep patterns (Cooper, Tyler, Wallace, & Burgess, 2004; Sangal, Owens, & Sangal 2005). There is little investigation into whether this association between sleep disorders and ADHD is also found among college students, and whether sleep disorders interact with ADHD status to compromise academic success in this population. The purpose of the present study was to examine whether this pattern of findings among children generalized to emerging adults.

Weyandt and DuPaul (2008) estimated the prevalence of ADHD among adults to be 2%-4%. College students with ADHD face academic and psychological challenges, aside from any that may be related to sleep problems. Heiligenstein, Guenther, Levy, Savino, and Fulwiler (1999) reported lower grades in this population, and they are less likely to attend and graduate from college (Advokat & Vinci, 2012). Shaw-Zirt, Popali-Lehane, Chaplin and Bergman (2005) found lowered self-esteem and social skills among those with ADHD. If the association of ADHD and sleep problems seen in the pediatric literature is found among college students, these students may face an additional, often undiagnosed or untreated, challenge to academic success.

The prevalence of sleep disorders in a college population is not well established. Gaultney (2010) reported that 29% of a general college population were at risk for some type of sleep disorder (as measured with a validated survey), although it is possible that some of these students were misinterpreting behavioral or environmental conditions that are not conducive to sleep as symptoms of sleep disorders. Taylor et al. (2011) found 9% of college students had insomnia.

An assessment of adolescents from ages 15-18 found that 25% reported symptoms of insomnia, but only 4% met the clinical criteria for insomnia disorder (Ohayon, Roberts, Zulle, Smirne, & Priest, 2000).

The cost of ignoring sleep problems at any age is high. Sleepiness, poor sleep quality, insufficient, or inconsistent sleep have been associated in the adolescent literature with deficits in attention and academic performance (Pagel, Forister, & Kwiatkowski, 2007), drowsy driving (Cummings, Koelsell, Moffat, & Rivara, 2001), risk-taking (O'Brien & Mindell, 2005), social relationships (Carney, Edinger, Meyer, Lindman, & Istre, 2006), and health (Smaldone, Honig, & Byrne, 2006).

### **Behavioral and Cognitive Outcomes Associated With Sleep Problems in Children**

Much more evidence supports a link between ADHD and sleep among children. A review by Owens (2009) of over 50 studies of children suggested that sleep disorders may co-occur with ADHD, and that the sleep disorder may contribute to hyperactivity and inattentiveness. Several sleep disorders in particular have been associated with behavior and/or academic problems in children, including sleep disordered breathing (SDB) and periodic limb movement disorder (PLMD)/restless legs syndrome (RLS). SDB is an umbrella term that includes obstructive sleep apnea (OSA), central apneas, upper airway resistance syndrome, and primary snoring. Although classified as separate disorders, both RLS and PLMD are characterized by abnormal leg movements that may interfere with sleep quality and/or quantity (Ohayon & Roth, 2002).

Sleep disorders in children can present with deficits in cognitive ability, academic success, or behavior. For example, children with SDB perform worse in school, and parents and teachers report worse daytime behavior (e.g. Beebe, Ris, Kramer, Long, & Amin, 2010). Urschitz et al. (2004) found that children who snored (sometimes used as a marker for SDB in research) had greater parent-reported hyperactivity, inattention, sleepiness, behavior, social, and emotional difficulties. While SDB has been connected with both behavioral and cognitive outcomes, RLS and PLMD have been associated primarily with behavior problems. Gaultney, Merchant, and Gringras (2009) found that parents of children who had been diagnosed with PLMD (based on currently-recommended criteria) reported more behavior problems than did parents of children diagnosed with SDB.

### **Behavioral and Cognitive Outcomes Associated With Sleep Problems in Adolescents and Adults**

In addition to the findings in the pediatric literature, some evidence suggests sleep issues among adults and adolescents with ADHD. Sobanski, Schredl, Kettler, and Alm (2008) examined sleep among adults with ADHD relative to matched controls with no psychopathology or sleep disorders. They found that the sleep architecture and other sleep parameters (based on two nights of polysomnography as well as subjective reports) differed between the two groups. Participants with ADHD demonstrated worse quality of sleep (more awakenings, a lower percentage of time in bed actually spent asleep) and a lower percentage of rapid eye movement sleep. Shur-Fen Gau and Chiang (2009) studied Taiwanese adolescents diagnosed with persistent ADHD or sub-threshold ADHD during childhood and controls. Self-reported data indicated that those with childhood ADHD experienced more sleep problems (such as symptoms of insomnia, bruxism, snoring, and nightmares) than did controls.

As appears to be the case in the pediatric literature, sleep problems can predict compromised academic outcomes in this older age group. Gaultney (2010) found that college students who appeared to be at risk for a sleep disorder were also more likely to be at academic risk (GPA < 2.0). Pagel and Kwiatkowski (2010) examined sleep characteristics among students in middle school, high school, or college. They found that self-reported restless legs and periodic limb movements predicted lower GPA in middle school students. Difficulties initiating and maintaining sleep (which may indicate insomnia or PLMD) predicted lower grades among college students. These studies, however, included a general population of students and did not examine whether the ADHD-sleep association found among children generalized to college students. Cohen-Zion and Ancoli-Israel (2004) reviewed 47 studies of associations between ADHD and sleep problems among children and adolescents ages 3-19. Parent-reported sleep problems were common among both medicated and non-medicated participants. Although the findings weren't unanimous, the data suggested ADHD-related increased nighttime activity, reduced rapid eye movement sleep, and increased daytime sleepiness, and possibly increased periodic limb movements during sleep.

The present study examined risk for sleep disorders among college students who had previously been diagnosed with ADHD relative to those diagnosed with

a learning disability ([LD]; a comparison disability that can also compromise academic success), and a comparison group without a known disability. Based on the pediatric literature, we expected that college students who had been diagnosed with ADHD would report lower sleep duration, more daytime sleepiness, and be at greater risk for sleep disorders relative to those with LD or those not diagnosed with a disability. Specifically, they would be at greater risk for OSA and RLS/PLMD. We further expected that students at risk for a sleep disorder would have lower GPA, and that risk for a sleep disorder would moderate the association of ADHD status with GPA.

## Method

### Participants

New, fulltime freshmen students at a large university in the southeast United States were invited to take part in the study. Participants were limited to new freshmen students for several reasons. Many students who begin college do not continue to graduation at the same institution. For example, only about 25% of entering freshmen in 2008 continued to graduation at the present institution within a four-year period, with another 34% still enrolled but not yet graduated (University of North Carolina General Assembly, 2014). Given the evidence that poor sleep predicts many aspects of emotional, physical, and academic health, early identification and remediation may improve a variety of health and academic outcomes. It is not unusual for grades to be low during the freshman year of college (Grove & Wasserman, 2004). If poor sleep contributes to academic difficulty, the ability to identify students at risk for sleep disorders early in their academic career may inform timely interventions designed to improve retention and graduation rates. Additionally, many entering freshmen are experiencing new social, personal, and academic challenges both from the transition from high school to college and from parental authority/oversight to personal responsibility. Beginning college has been associated with increases in stress and anxiety (Rawson & Bloomer, 1994) that can both interfere with and be exacerbated by poor sleep as well as compromise grades. Freshmen, therefore, are at risk for both sleep and academic problems, yet still early enough in their academic career that identifying and eliminating barriers to success may improve their academic outcome.

Although 1110 students opened the survey, GPA and disability status information were available for 1089. Of these 1089 students, four had a dual diagnosis of ADHD and LD, and were dropped from the analyses. The final sample, therefore, consisted of 59 diagnosed with ADHD, 16 previously diagnosed with LD, and 1010 with neither ADHD nor LD ( $N_{\text{total}}=1085$ ). Sixty-six percent of participants with ADHD and 19% of those with LD thought the disability affected their school work either moderately or considerably. Participants were not asked about treatment or medications.

Missing data for those who did not finish the survey (~13%) were imputed using serial means in order to avoid potential bias due to listwise deletion of cases (e.g. Roth, 1994). Descriptive data are available in Tables 1 and 2. Gender of students who began the survey did not differ from those who completed the survey. The non-completers were more likely to be minority students. We explored replacement of missing risk for sleep disorder scores (yes/no) in two ways. Participants with missing data were assigned a designation of “no disorder” in order to be conservative. Secondly, we imputed values for the scales used to determine risk for sleep disorder, then determined status using the imputed scales. The resulting percentages of risk for each disorder were nearly identical, and the pattern of results the same. Risk scores generated using the latter method are reported here.

### Materials

The primary outcome of interest was risk for sleep disorders. The Sleep-50 survey (Spoormaker, Verbeek, van den Bout, & Klip, 2005) was used to estimate risk for sleep disorders. This survey has been validated by polysomnography, and used to estimate prevalence of sleep disorders among college students. The survey generates scales of symptoms of several sleep disorders as well as a daytime impact scale. Risk for a specific disorder is based on established cut-off values for the symptoms of that disorder in combination with extent of daytime impact; therefore risk for a disorder reflects both the occurrence and severity of symptoms and severity of daytime impact. Risk scores for OSA, insomnia, RLS/PLMD (the survey collapses across risk for these two limb-related disorders) and circadian rhythm disorder ([CRD]; a mismatch between physiological readiness to fall asleep and required sleep schedule, including shift work and delayed sleep phase syndrome) were included in this report, and reported



Table 2

*Characteristics of Participants at Risk for Sleep Disorder or No Known Sleep Disorder*

	No Apparent Risk for Sleep Disorder <i>N</i> =727 <i>M</i> ( <i>SD</i> )	Risk for Sleep Apnea <i>N</i> =106 <i>M</i> ( <i>SD</i> )	Risk for Insomnia <i>N</i> =260 <i>M</i> ( <i>SD</i> )	Risk for RLS/ PLMD <i>N</i> =165 <i>M</i> ( <i>SD</i> )	Risk for CRD <i>N</i> =145 <i>M</i> ( <i>SD</i> )
GPA	2.98 (.80)	2.66 (.88)	2.70 (.94)	2.71 (.95)	2.61 (.98)
Typical Sleep Duration					
Weekday	6.57 (1.21)	6.05 (1.70)	6.02 (1.67)	6.15 (1.68)	6.15 (1.68)
Weekend	9.72 (1.53)	9.74 (2.17)	9.56 (2.47)	9.81 (2.31)	9.93 (2.44)
Daytime Sleepiness	8.51 (3.31)	11.28 (3.96)	10.26 (4.09)	10.86 (3.82)	10.88 (4.25)

*Note.* RLS/PLMD: Restless Legs Syndrome/Periodic Limb Movement Disorder; CRD: Circadian Rhythm Disorder; “weekend” is operationalized as a night when participants did not have work or school the following day. Risk groups are not mutually exclusive, so sample sizes do not add to 1085.

Table 3

*Bivariate Correlations*

	GPA	Weekday Duration	Weekend Duration	Sleepiness	Apnea	Insomnia	Risk for RLS/PLMD
GPA	--						
Typical Sleep Duration							
Weekday	-.03	--					
Weekend	.03	.38**	--				
Daytime Sleepiness	-.07*	-.10**	.03	--			
At Risk for							
Apnea	-.10*	-.12**	.02	.18**	--		
Insomnia	-.12*	-.22**	-.02	.16**	.35**	--	
RLS/PLMD	-.09**	-.11**	.04	.20**	.40**	.45**	--
CRD	-.12	-.25**	.08**	.16**	.29**	.42**	.29**

*Note.* RLS/PLMD: Restless Legs Syndrome/Periodic Limb Movement Disorder; CRD: Circadian Rhythm Disorder; \* $p < .05$ , \*\* $p < .01$ ; correlations with categorical variables are Spearman’s rho; “weekend” is operationalized as a night when participants did not have work or school the following day

as dichotomous variables. Although scales for nightmares, sleepwalking, and sleep state misperception can be derived from the survey, incidence of these disorders was low. In addition, a narcolepsy scale is available, but it appears to be less reliable than the other scales (Gaultney 2010; Spoormaker et al. 2005), so it was not reported here. Psychometric properties of the Sleep-50 are acceptable (internal consistency [Chronbach's  $\alpha = .85$ ]; test-retest reliability [ $r = .78$ ]; sensitivity .71 to .85; specificity .69-.88).

Given reports in the literature about sleep disruption associated with ADHD (e.g. Gamble et al., 2013), several aspects of sleep and sleepiness were examined in addition to risk for sleep disorders in order to characterize the participants. We asked participants to estimate typical sleep duration when the participant did not have school or work the next day (weekend), duration when the participant did have school or work the next day (weekday), and time of day when they think they function best (morning, evening, both, neither). Typical daytime sleepiness was measured using the Epworth Sleepiness Scale (Johns, 1991). Participants were asked how likely they would be to fall asleep during the day (0=would never doze, 3=high chance of dozing) in different circumstances, such as stopped at a traffic light or sitting and reading) and the responses summed. A score  $> 9$  indicates a meaningful level of sleepiness, and a score  $> 16$  indicates a dangerous level of sleepiness. The scale has been widely reported in the literature as an acceptable measure of daytime sleepiness (Johns, 1992).

Disability status (ADHD or LD) was determined by self-report. Participants indicated whether they had received a diagnosis of either disorder from a health care professional. We obtained each student's GPA at the end of the semester from the university in the form of de-identified data. Descriptive information included demographic information and typical amount of time spent studying/week.

### Procedure

All new, full-time freshmen students were contacted by email during their first semester (September or February of the 2011-2012 academic year). Reminders were sent a month later to those who had not yet responded. Students were given a link and a password in the email that led to the survey, and were able to access the survey at the time and place of their choosing. The project was approved by the university institutional review board. Data from the Sleep-50

were reviewed at the end of the academic year, and students who appeared to be at risk for a sleep disorder were notified of this by email (stressing that the survey could not diagnose a disorder) and offered referrals to local sleep physicians upon request.

### Data Analysis

Preliminary analyses included descriptive and correlational data for this sample, separately for those with ADHD, LD, or neither disability (Table 1) and separately by risk for sleep disorder (Table 2). Group comparisons of means using analysis of variance were not calculated since the sample sizes were quite different. Disability status was dummy coded, using "no known disability" as the reference group. By entering each disability term (ADHD only and LD only) separately in all regression analyses, we were able to compare students with each disability to students with no known disability. Regression analyses examined associations between disability status, sleep duration, and sleepiness (Table 4). Since risk for each of the four targeted sleep disorders were dichotomous variables, disability-related risk for each sleep disorder was examined using logistic regression (Table 5). A regression analysis examined the last prediction that risk for sleep disorders would predict GPA, and that risk for sleep disorders would moderate ADHD status (Table 6). Separate interaction terms of ADHD with each of the four sleep disorders were computed by multiplying ADHD status and risk for each sleep disorder.

### Results

See Tables 1 and 2 for descriptive data and Table 3 for correlational data. Correlational analyses examined the validity of measures. Of interest were associations with GPA, sleep duration, and sleepiness. This sample reported an average sleepiness score of 9.11 ( $SD = 3.64$ ). Sleeper students had lower GPAs and greater likelihood of risk for each of the four sleep disorders. Sleep duration did not associate significantly with GPA. Three of the four sleep disorders were unrelated to weekend sleep. Risk for a circadian rhythm disorder predicted greater weekend sleep duration, likely indicating an effort to "catch up" on sleep over the weekend when participants could match their sleep time to their circadian rhythm. All three sleep disorders predicted less sleep during the week and lower GPA. The four sleep disorders reported here were moderately intercorrelated,

Table 4

*Sleep Duration and Daytime Sleepiness Regressed on ADHD and LD Diagnoses (N=1085)*

	<u>B (SE)</u>	<u><math>\beta</math></u>	<u><i>t</i></u>	<u>95% CI</u>
<b>Epworth Sleepiness Scale, <math>R^2=.004</math></b>				
Constant	9.17 (.11)		80.24**	8.95 to 9.39
ADHD Diagnosis	-.96 (.49)	-.06	-1.98*	-1.92 to -.01
LD Diagnosis	-.66 (.82)	-.02	-.72	-2.46 to 1.13
<b>Sleep Duration Weekday, <math>R^2=.004</math></b>				
Constant	6.42 (.04)		147.72**	6.34 to 6.51
ADHD Diagnosis	-.39 (.18)	-.06	-2.10*	-.75 to -.03
LD Diagnosis	.05 (.35)	.004	-.14	-.64 to .73
<b>Sleep Duration Weekend, <math>R^2=.001</math></b>				
Constant	9.72 (.06)		165.92**	9.60 to 9.83
ADHD Diagnosis	-.09 (.25)	-.01	-.38	-.58 to .40
LD Diagnosis	-.34 (.47)	-.02	-.73	-1.26 to .58

Table 5

*Binary Logistic Regression Predicting Risk for Sleep Disorder (N=1085)*

	<u>B</u>	<u>S.E.</u>	<u>OR</u>	<u>95% CI</u>
<b>Sleep Apnea (<math>R^2=.002</math>)<sup>1</sup></b>				
Constant	-2.24	.11	.11**	8.95 to 9.39
ADHD Diagnosis	.39	.40	1.48	.68 to 3.20
LD Diagnosis	-.47	1.04	.63	.08 to 4.80
<b>Insomnia (<math>R^2=.01</math>)</b>				
Constant	-1.20	.08	.30**	6.34 to 6.51
ADHD Diagnosis	.68	.28	1.97*	1.14 to 3.41
LD Diagnosis	.10	.58	1.10	.35 to 3.46
<b>RLS/PLMD (<math>R^2=.01</math>)</b>				
Constant	-1.75	.09	.17**	9.60 to 9.83
ADHD Diagnosis	.68	.31	1.97*	1.07 to 3.63
LD Diagnosis	-.95	1.04	.38	.05 to 2.94
<b>CRD (<math>R^2 = .004</math>)</b>				
Constant	-4.90	.09	.15**	
ADHD Diagnosis	.56	.33	1.74	.92 to 3.30
LD Diagnosis	.04	.64	1.04	.30 to 3.64

Note. <sup>1</sup>Nagelkerke  $R^2$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; RLS/PLMD: Restless Legs Syndrome/Periodic Limb Movement Disorder; CRD: Circadian Rhythm Disorder

Table 6

*Predicting GPA Regressed on Disability Diagnosis and Risk for Sleep Disorder (N=1085;  $R^2_{total} = .03$ )*

		<u>B (SE)</u>	<u><math>\beta</math></u>	<u><i>t</i></u>	<u>95% CI</u>
GPA	$R^2=.01$				
Block 1					
Constant		2.92 (.03)		110.28**	2.87 to 2.97
ADHD Diagnosis		-.32 (.11)	-.09	-2.85**	-.54 to -.10
LD Diagnosis		-.07 (.21)	-.01	-.32	-.48 to .35
Block 2					
Constant	$R^2=.01$	3.00 (.03)		99.17**	2.94 to 2.97
ADHD Diagnosis		-.28 (.11)	-.07	-2.47*	-.50 to -.06
LD Diagnosis		-.07 (.21)	-.01	-.35	-.48 to .34
Risk for Apnea		-.10 (.10)	-.04	-1.03	-2.9 to .09
Risk for Insomnia		-.14 (.07)	-.07	2.01*	-.28 to -.004
Risk for RLS/PLMD		-.05 (.08)	-.02	-.61	-.21 to .11
Risk for CRD		-.21 (.08)	-.09	-2.55*	-.38 to -.05

*Note.* RLS/PLMD: Restless Legs Syndrome/Periodic Limb Movement Disorder; CRD: Circadian Rhythm Disorder; \* $p < .05$ , \*\* $p < .01$

We expected that students who had previously been diagnosed with ADHD would report lower sleep duration, greater sleepiness, and greater risk for a sleep disorder. Table 4 presents regression analyses examining ADHD and LD diagnoses (each relative to those who did not report either diagnosis) as predictors of sleepiness and sleep duration. The ADHD and LD diagnosis terms were entered simultaneously. Neither students with ADHD nor those with LD reported more weekend sleep duration than the participants with no known disability. As expected, students diagnosed with ADHD reported less sleep during the week. Unexpectedly, a diagnosis of ADHD predicted less sleepiness during the day.

We hypothesized that students with ADHD would be at greater risk for OSA and RLS/PLMD. Table 5 presents logistic regression analyses predicting risk for each of the four disorders. Students with ADHD were at greater risk for two of the four sleep disorders (insomnia and RLS/PLMD). There was not a significant association of LD status with any sleep disorder.

We expected associations of GPA with diagnoses of ADHD, LD and risk for the four sleep disorders, and predicted an interaction of risk for sleep disorder and a diagnosis of ADHD. Diagnosis of ADHD or LD was entered in an initial block, risk for the four sleep disorders in a second block, and interaction terms of ADHD with each sleep disorder in a third block. The interaction terms did not increase amount of variability explained by the model either separately or as a block; therefore, only the main effect tests are reported here (see Table 6). Students with a diagnosis of ADHD and those at risk for insomnia or a circadian rhythm disorder had lower grades. Block 2, risk for sleep disorders, increased variability explained by 2% over and above variability explained by disability status. Specifically, risk for insomnia and risk for circadian rhythm disorder explained significant variability over and above that explained by a diagnosis of ADHD or LD. Risk for insomnia decreased GPA by 14%, and a circadian rhythm disorder decreased GPA by 21%. Beta scores, which reflect standardized data and can be compared, indicated that ADHD status,

risk for insomnia, and risk for circadian rhythm disorder were equally predictive of GPA.

### Discussion

The present study hypothesized that college students with ADHD would report less sleep and more daytime sleepiness, would be at greater risk for sleep disorders (specifically OSA and RLS/PLMD), and that risk for sleep disorders would predict GPA and would function as a moderator of ADHD status on GPA. College students with ADHD reported less sleep during the week and were more likely to be at risk for insomnia and restless legs syndrome/periodic limb movement disorder. A diagnosis of ADHD, risk for insomnia, or risk for a circadian rhythm disorder predicted lower grades. Risk for any of the four sleep disorders did not moderate the association of ADHD with GPA, suggesting that ADHD and risk for at least some sleep disorders may be separate but perhaps equal obstacles to academic success. Variance associated with sleep disorders was over and above that associated with disability status. Findings from the present study indicate that the association of some sleep disorders with ADHD reported in the pediatric literature also applies to college students. These findings are consistent with earlier reports of an association of sleep problems (that may or may not indicate sleep disorders) with ADHD that is consistent from childhood to adulthood (Sobanski, et al., 2008).

The specific hypothesis of connections between ADHD and both OSA and RLS/PLMD was partially supported; an association with RLS/PLMD but not OSA emerged. There is an inconsistency in the pediatric literature as to whether OSA is associated with ADHD. Data have reported associations between sleepiness, snoring, and symptoms of OSA with symptoms of ADHD (e.g. Chervin et al., 2002). Other studies, however, have concluded that there was better evidence for a connection between ADHD and periodic limb movement during sleep (Cohen-Zion & Ancoli-Smith, 2004). Our findings reflect this latter position. A possible explanation for the inconsistent reports in the literature may be the association of different types of ADHD (inattentive, hyperactive, or combined) with different sleep disorders (Miano, Parisi & Villa, 2012; Silvestri et al. 2009), or perhaps differences in severity or diagnostic accuracy (e.g. Gaultney et al. 2009).

Several explanations have been offered for linkages between ADHD and symptoms of sleep disorders.

ADHD (or its treatment) may cause sleep disturbances, may be caused by the sleep disorder (e.g. the sleep disorder presents with symptoms characteristic of ADHD), or the two may have a common underlying cause. For example, the individual who is hyperactive during the day may display greater bedtime resistance (ADHD→sleep disorder; e.g. Gaultney, Terrell, & Gingras 2005). Difficulty settling down at night and falling asleep might partially explain the connection with insomnia found in these data. Likewise, the use of stimulant medication to treat ADHD may interfere with sleep; however, sleep disturbances have been reported in both medicated and non-medicated children with ADHD (O'Brien et al., 2003) and use of stimulant medication by adults with ADHD appeared to improve sleep (Sobanski, et al., 2008). The discomfort of RLS may exacerbate a tendency to fidget and be distracted (sleep disorder→ADHD). Likewise, the daytime sleepiness resulting from a sleep disorder may reduce ability to pay attention or to inhibit behavior. Sleepiness seems unlikely to explain the association reported here, however, since students diagnosed with ADHD reported less sleepiness than others. Finally, several studies (e.g. Picchiatti et al., 1999; Wagner, Walters, & Fisher, 2004) have suggested that both ADHD and PLMD and/or RLS (which often co-occurs with PLMD) may be different manifestations of an underlying dopamine deficiency, which may, in turn, be due to insufficient or ineffective serum iron levels. Iron supplementation has been used in some cases to treat both PLMD (Simkajornboon, 2006) and ADHD (Konofal, Lecendreux, Arnulf, & Mouren, 2004; Konofal et al., 2008). At this time, dopaminergic therapy has not been shown to effectively treat ADHD (England et al., 2011).

The fact that students with ADHD did not appear to be at greater risk for circadian rhythm disorders is interesting. One study of adults has suggested that sleep problems in individuals with ADHD may be due to a circadian disruption. Van Veen, Kooij, Boonstra, Gordijn, & Van Someren (2012) found that participants with ADHD had delayed melatonin onset (melatonin is a hormone that initiates physiological changes preparatory to sleep) and longer sleep onset latency. In the present sample, the reported greater risk of insomnia may have reflected these students' delayed circadian rhythm rather than the inability to fall asleep (insomnia). The two disorders differ in that those with insomnia have difficulty initiating and/or maintaining sleep regardless of time of onset, whereas those with

a circadian delay fall asleep easily once their bodies are physiologically ready to sleep. When a delayed circadian rhythm is in conflict with scheduled responsibilities, the individuals may perceive the difficulty falling asleep early as insomnia. Furthermore, the fact that these students were all freshmen with a mean age of 18.6 indicates that they may have been affected by the typical delayed sleep phase during adolescence (Crowley, Acebo, & Carskadon, 2007). Had age been more variable, a circadian delay for those with ADHD may have been more apparent.

Likewise, the finding that those diagnosed with ADHD reported lower (less) sleepiness scores is surprising. Given that they reported getting less sleep during the week and were at greater risk for some sleep disorders relative to those without ADHD, the lower sleepiness score is not easily explained. Note, however, that the mean sleepiness score met the threshold of 9. This high level of sleepiness in the entire group may have obscured finer group distinctions. Overall, if these students were representative of freshmen in general, this age group may be experiencing drastic levels of sleepiness independently of disability or disorder status.

Given the finding that risk for a sleep disorder predicted lower GPA, perhaps it would be useful for universities to recognize sleep disorders as a “respectable” and potentially treatable condition. Although not a recognized disability, these data suggest that sleep disorders may be an academic handicap that could be identified and perhaps treated. Connections between sleep disorders and general mental and physical health add weight to the suggestion that sleep disorders be recognized, identified, and intervention offered. Although it seems intuitive that treating a sleep disorder will improve college academic success, and ultimately retention and graduation, this has yet to be demonstrated empirically. Successful treatment of sleep disordered breathing in children (adenotonsilectomy in these examples) has predicted improved cognition (Friedman et al. 2003), quality of life (Ye et al. 2010), behavior (Urschitz et al. 2004) and affect (Mitchell & Kelly 2007), all of which can play a role in academic outcomes. However, academic improvement subsequent to successful treatment of a sleep disorder is not assured. Gozal and Pope (2001) found that academic differences between snorers and non-snorers in 1st grade were still evident in 7th-8th grade regardless of current snoring status.

The findings reported here should be considered in light of several limitations. First, the variability explained by the regression analyses is quite small, and the significant findings influenced by sample size. Because of this, conclusions about connections between risk for sleep disorders and disability status, and associations with GPA are tentative. However, small effect sizes are not necessarily unimportant (for example, a difference of a GPA of 1.9 and 2.0 determines whether a student continues taking classes). The LD group was quite small; the lack of significant findings for that group could be due to low power.

Data reported by this sample of students probably overestimated the risk for sleep disorders in general. Prevalence for the disorders reported here are higher than those reported in the general adult population and higher than in other studies of college students (Gaultney, 2010). The high sleepiness level reported here may have contributed to over-reporting symptoms of sleep disorders. Although we did not recruit specifically among students with troubled sleep, it is likely that the students who completed the survey were those who were concerned about their sleep, thereby over-estimating prevalence of symptoms of sleep disorders. It is also possible that maladaptive sleep-related behaviors and conditions or circadian disruptions were misinterpreted as symptoms of insomnia.

We had no independent verification of a disability diagnosis; we depended on self-report of these conditions, with all the unreliability inherent to this type of data. Given this, we can't confirm that students accurately reported the presence or absence of a disability, nor the extent to which the disability limited academic success. We did not have data on whether or not a disability had been treated, and whether or not the treatment was effective. Likewise, the sleep survey used here, although validated against diagnoses of sleep disorders backed up by polysomnography, cannot diagnose a sleep disorder.

The total sample size in the present study was large and its diversity reflected that of the larger university community. However, males and non-minority students were over-represented (relative to the entire freshman class) among those with a diagnosis of ADHD or LD. It offered a preliminary consideration of self-reported risk for sleep disorders among students who reported a diagnosis of ADHD, and raised the possibility that sleep disorders are an equally legitimate threat to academic success. If additional

research supports these patterns, universities may wish to consider voluntary screening and interventions for sleep problems, particularly among those with ADHD or who are in academic jeopardy.

### Implications for Practice

Given the association of sleep problems (disorders as well as environmental and behavioral) with GPA and increased risk of sleep disorders among students with ADHD, several practical applications of this information can be considered. Students with a known disability can be screened for sleep problems and appropriate intervention offered if indicated. For example, those with symptoms of a sleep disorder could be referred to a local sleep physician. If the problem appears to be behavioral or environmental, educational interventions can be made available. This has been tried at a few institutions with varying success. For example, brief interventions for poor sleep habits have been tried with varying success. Brown, Buboltz, and Soper (2010) proposed a Sleep Treatment and Education Program for Students (STEPS), finding that students in the treatment group reported improved sleep quality and hygiene six weeks after treatment.

A few institutions have tested interventions for insomnia. Taylor, Lichstein, Weinstock, Sanford, and Temple (2007) demonstrated improvement in indices of insomnia among a small sample of students following six sessions of cognitive-behavioral therapy. Morin, Beaulieu-Bonneau, LeBlanc, and Sevard (2005) pilot-tested a “self-help” form of insomnia therapy administered to 192 adults via correspondence. They found that a low-cost, easily-delivered form of therapy produced measurable improvements in symptoms of insomnia in a general population. Other efforts have targeted poor sleep hygiene rather than a sleep disorder. Orzech, Salafsky, and Hamilton (2011) reported a media campaign directed at college students. Posters promoting the positive effects of sleep were placed in residence halls and a student newspaper, a health education article containing summaries of articles on student sleep, along with sleep questions and answers, were delivered to students on campus. Students later reported improved sleep quality, earlier bedtime, extended sleep duration, shortened sleep onset latency, and better sleep quality following the intervention. Lund, Reider, Whiting, and Prichard (2010) tested an intervention that targeted sleep practices and stress management and found improved physical and mental health.

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# Self-Report Assessment of Executive Functioning in College Students with Disabilities

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## Abstract

This study presents a unique assessment of executive functioning (EF) among postsecondary students with disabilities, with the aim of understanding the extent to which students with different disabilities and in different age groups assess their own difficulties with relevant and educationally-adaptive skills such as planning, initiating, managing time, staying on task, and controlling emotions. Students from a large Midwest public university applying for and/or receiving services at a university-based disability office ( $n = 50$ ) completed the Behavior Rating Inventory of Executive Function- Adult Version (BRIEF-A) and a demographic questionnaire. Study groups were formed according to participants' self-reported disability or disabilities—including attention deficit hyperactivity disorder (ADHD), psychiatric disabilities, learning disabilities, traumatic brain injury, autism spectrum disorder, deaf and hard of hearing, and/or visual impairment—as well as those reporting single versus multiple disabilities and freshman versus all other class standings. Results revealed elevated EF ratings by students in the ADHD and psychiatric groups, particularly with regard to metacognitive skills. Freshman students reported less frequent EF challenges than older students, and identifying with more than one disability group was not a risk factor for elevated EF scores. Practical implications are discussed in terms of the utility of EF self-assessment in this population, and in supporting metacognitive strategies for postsecondary students with disabilities.

*Keywords: Executive functioning, self-report, college, disability*

This study was developed as a result of the authors' experiences working with postsecondary students with disabilities and the anecdotal observation that students seeking accommodation services often identify challenges with some aspects of executive functioning (EF). The brain processes associated with impairments in EF have functional implications in everyday life, especially with academic learning. Challenges or weaknesses in specific areas of EF can create inefficiencies in school and difficulty demonstrating knowledge, compromising for example, study skills and test performance (Kornell & Metcalfe, 2006). Therefore, this study addresses what may be ostensibly considered an initial step: exploring self-perception of EF.

While postsecondary students who disclosed a disability comprise approximately 11 percent of the total postsecondary population (National Center for Education Statistics, 2009), graduation statistics indicate that college students with disabilities are underrepresented in students who earn a degree. The National Center for Education Statistics (2009) reports that half of enrolled students with a disability earn a degree compared to two-thirds of their peers who do not have a disability. With this knowledge of specific EF domains of strength and challenge that students perceive, practical mechanisms can be identified for supporting postsecondary students with disabilities toward the management and organization of goal-directed behaviors that promote academic achievement and, ultimately, degree attainment.

## Executive Functioning

**Overview and conceptualization.** The DSM-IV defines EF as the ability to think abstractly and to plan, initiate, sequence, monitor, and stop complex behavior (American Psychiatric Association, 2000). However, researchers have proposed a number of working definitions for the umbrella term which may represent distinctly different—yet interrelated—abilities that all contribute to desired goal-directed behaviors. Examples of some of these concepts include anticipating, planning, strategizing, organizing, inhibiting, monitoring, shifting, initiating, self-regulating, adapting, judging, and deciding (Gioia, Isquith, Guy, & Kenworthy, 2000; Gioia, Isquith, Retzlaff, & Espy, 2002; Mahone et al., 2002; Mangeot, Armstrong, Colvin, Yeates, & Taylor, 2002). In a review of the historical evolution of conceptualizing EF, Royall et al. (2002) identified two major themes that emerged: that EF (1) are higher order *cognitive functions* such as will, abstraction, and judgment, which are acquired skills that can be directly measured, and (2) these function to *control* the execution of complex activities. Indeed, personal agency is required to produce desired outcomes over time, and that a sense of self-efficacy—essential for developing human agency—is reflective of one’s cognitive control abilities and contingent upon the experience of successfully executing complex activities.

The interrelated behaviors indicative of EF are necessary for cognitive and behavioral problem-solving (Gioia et al., 2002). For example, when faced with a task such as writing a college-level paper, a student must formulate a goal (e.g., producing a written product within topic guidelines and other limits), expect particular outcomes (e.g., desired grade received, positive self-evaluation, ownership of the final product, encouragement/reinforcement from others), and subsequently employ sets of strategies (e.g., visualizing, cognitive and behavioral planning, regulating emotion, creating/accessing a work-conducive environment) to use materials and resources (e.g., research materials, computer/software, adaptive technology) within specified limits (e.g., time) in order to successfully complete the task (e.g., submitted written product). These interrelated steps are indicative of the individual’s executive processes that facilitate independent goal-attainment. Indeed, individuals rely on such processes on a daily basis to self-direct behavior within all tasks that are novel and/or complex and require effortful responses (Henry & Bettenay, 2010).

Suchy (2009) outlined seven approaches to defining EF: (1) overarching evolutionary purpose, (2) clinical syndromes, (3) complex skills, (4) elemental neurocognitive processes, (5) atheoretical approaches, (6) neuroanatomic substrates, and (7) constructivistic definitions. The applicable settings and purposes for examining EF are diverse and apply to clinical applications in rehabilitation, health promotion, educational interventions, medical and surgical interventions, and substance abuse treatment. Approaches to conceptualizing EF constructs in line with Suchy’s definitions thus largely depend on the setting and purpose of the researcher or clinician, such that a psychologist or educator might be interested in functional behavioral applications to the concepts while a neurosurgeon would be interested in the direct influences of specific brain structures.

While it is recognized that the conceptualization of EF is still evolving, there seems to be a consensus among researchers that EF refers to brain circuits that prioritize, integrate and regulate other cognitive functions and provide a mechanism for self-regulation (Vohs & Baumeister, 2004). EF has been referred to as the management system of the brain that controls and facilitates several cognitive or brain processes including, for example, cognitive flexibility, initiating appropriate actions and inhibiting others, planning/organizing, working memory, self-monitoring, and emotional control. This definition of EF provides the theoretical and practical framework for this study focused on self-perception of EF strategies and skills among postsecondary students with disabilities.

Furthermore, EF will be understood as a combination of complex cognitive processes that promotes successful task completion through self-directed behaviors. This conceptualization of EF is most consistent with two of the approaches outlined by Suchy (2009): the complex skills and constructivistic approaches. The complex skills approach defines EF by the behavioral skills that are considered to fall under the “umbrella term,” including such skills as planning, reasoning, problem-solving, organizing, and social appropriateness. Describing EF by identifying a set of skills that are purported to fall under the term can be helpful because the terms can be operationalized, observed, and reported on fairly readily, and research outcomes involving any of the skills can be explained in understandable terms. This definition values the extent to which executive functions emerge and are observable

in everyday life. The constructivistic approach values theoretical models that introduce new constructs or latent variables into the understanding of EF (Suchy, 2009), which could include the notion of a “central executive” that Baddeley (1998) has proposed. This concept can be useful in separating functional analyses from anatomical localization, as the central executive places a greater focus on understanding the complex behavioral subcomponents of EF before attempting to localize particular brain structures responsible for those behaviors. Suchy (2009) proposes a “tripartite” model of EF that consists of the abilities to (1) form, (2) maintain, and (3) shift mental sets. This model of delineating executive processes into three major subcomponents can be useful in conceptualizing EF in a manner that accounts for the complexity of the concept while including factors included in each of the definitional approaches presented in this review.

**EF, Disability and the Tasks of Postsecondary Students.** Given the complex and higher order nature of EF, the development and maturation is more prolonged suggesting ongoing development into adulthood. For example, self-regulation of both emotion and behavior can extend through adolescence and early adulthood (Span, Ridderinkhof & van der Molen, 2004; van der Molen, 2000; Zelazo, Craik, & Booth, 2004). Therefore, EF processes are continuing to develop and mature during the time that many individuals are involved in postsecondary education, which is a key focus of this study.

EF challenges are identified among many disability groups. Barkley (2012) asserts that the underlying psychological difficulties in ADHD giving rise to symptoms of inattention and distraction and hyperactivity involve deficits in all of the major EFs, and each of these EFs is a type of self-regulation – a special form of self-directed action. Morris et al., (1998) note that many students with learning disabilities experience impairments with EF. Furthermore, many researchers have suggested that students with EF impairments can experience functional limitations including difficulty with activating and sustaining effort across time, regulating intense emotional reactions to daily frustrations and effectively managing the transition to postsecondary environments given the greater demand to organize and maintain goal-directed behavior (Parker & Benedict, 2002). Many studies have focused on injuries and illnesses that are directly associated with brain damage/lesions or other neurological deteriora-

tion (e.g., traumatic brain injuries, stroke, Parkinson’s disease) and those that are directly associated with functional and adaptive impairment (e.g., dementia, schizophrenia; Bak et al., 2008; Jurado & Rosselli, 2007; Krpan, Levine, Stuss, & Dawson, 2007). Executive impairments are often quite obvious in these conditions and therefore a focus of intervention and rehabilitation efforts is to aggressively re-train lost skills that can support independent living or improve aspects of cognitive functioning through psychopharmacologic intervention (Reynolds & Horton, 2008; Royall et al., 2002). Despite the focus on disorders for which EF is a prominent contributor to the disability, emerging evidence that EF is associated with protective health behaviors (Hall, Elia, & Crossley, 2006), stress regulation (Williams, Suchy, & Rau, 2009), and treatment adherence (Schillerstrom, Horton, & Royall, 2005) supports broader inquiry into EF for individuals with disabilities not traditionally considered to be associated with EF deficits.

**Assessment of EF.** Performance-based measures of EF can be found in neuropsychological test batteries such as the *Cognitive Assessment System* ([CAS]; Naglieri & Das, 1997), the *Halsted-Reitan Neuropsychological Battery* (Reitan & Wolfson, 1993), and the *Delis-Kaplan Executive Function System* ([D-KEFS]; Delis, Kaplan, & Kramer, 2001) that have compiled similar tasks including trail-making, categorization, verbal fluency, and the Stroop effect (Stroop, 1935). Others such as the *Wisconsin Card Sorting Test* (Heaton, Chelune, Talley, Kay, & Curtiss, 1993) and the *Connors’ Continuous Performance Test* (Connors, 2004) are stand-alone instruments to measure aspects of EF in a clinical setting. Aspects of EF are also tapped by widely-used intelligence tests. For example, the Block Design subtest of the Wechsler (Wechsler, 2008) scales requires some degree of cognitive and motor planning and strategy use in addition to the ‘pure’ visual-perceptual skills required to match the blocks to the stimuli. Working memory has been proposed as a central executive skill (Baddeley, 1998), and is included as a composite of the WISC-IV and WAIS-IV. The *Stanford-Binet—Fifth Edition* (Roid, 2003) includes a sorting/categorization task that elicits executive components similar to those being tapped in stand-alone sorting tasks (e.g., WCST, D-KEFS Sorting).

While performance-based neuropsychological tests attempt to measure EF constructs (i.e., planning, strategizing, shifting, etc.), it has not been reliably

demonstrated that deficits on these measures necessarily translate to deficits in real-life situations that require comparative abilities (Gioia et al., 2002). It may be argued, then, that EF tests currently used in clinical settings may lack ecological validity as a result of the narrow abilities that each test attempts to measure (Goldberg & Podell, 2000). For example, poor performance on the Stroop task might not necessarily have behavioral challenges with verbal inhibition, such as making inappropriate or impulsive comments to peers or professors.

An alternative to assessing EF via performance-based neuropsychological tests is the use of a behavioral rating scale that measures the degree of EF impairment in everyday tasks/behaviors. The *Behavior Rating Inventory of Executive Function-Adult* ([BRIEF-A]; Gioia et al., 2000) is a self- and other-report rating scale that was developed with the recognition of brain complexity and interconnectedness, but relies on a self- and/or other/ proxy-reports of practical, observable behaviors that represent facets of EF from an adult's everyday life.

There are several versions of the BRIEF normed for different age populations. The original BRIEF was designed for school-aged children and included a teacher and parent rating scale (Gioia et al., 2000). There is also a BRIEF-Preschool version (BRIEF-P; Gioia, Espy, & Isquith, 2003) and an adolescent self-report version ([BRIEF-SR]; Guy, Isquith, & Gioia, 2004). The BRIEF was originally developed to provide a standardized measure of EF in children that was easy to administer and score, while also generating clinically meaningful information. The adolescent version offers a self-perception component focused on the adolescent's view of self-regulatory functioning ([BRIEF-A]; Roth, Isquith, & Gioia, 2005). These forms of the BRIEF with demonstrated appropriate internal consistency, stability over time, strong content validity, and good clinical utility for detecting EF challenges in populations with a variety of disabilities form the catalyst for the development of the adult based BRIEF (Roth et al., 2005).

### Study Rationale and Aims

The current study was developed around three primary aims: (1) to elucidate EF factors for postsecondary students with disabilities, including an identification of self-perceptions of strengths and challenges across disabilities, (2) to establish an initial stage of utilizing

self-reports of EF that can inform supportive interventions in the context of a disability services office, and (3) to provide participants with the opportunity to increase self-awareness of underlying factors that may be contributing to academic and/or social difficulties.

## Method

### Participants

A sample of undergraduate and graduate students in a large Midwestern university participated in this study (N = 50). All participants were in the process of applying or approved for formal classroom accommodations due to one or more disabilities through the university disability resource center, which was the sole inclusionary criterion. Demographic data are presented in Table 1. Students' electronic records – containing information including documented disability type, class standing, grade point average, and case notes – were not accessed in this study, in an effort to maintain the separation between clinical/educational and research files. Therefore, all demographic information was gained via self-report on a demographic form constructed for this study. Participants were recruited through the disability resource center through a combination of posted flyers and informational materials describing the study that were provided to students as they arrived for an appointment with the staff psychologist, an accommodations specialist, or a pre-doctoral intern. After students were provided with information describing the study, disability resource center staff did not actively recruit their clients, in an effort to prevent perceptions of coercion to participate and dual clinical-research relationships with students. Materials directed students to discuss the study with their assigned center staff if interested in participating.

### Materials

The *Behavior Rating Inventory of Executive Function—Adult Version* (Roth et al., 2005) is a self-report instrument designed for individuals aged 18-90 years old and measures an individual's perception of their own EF. The BRIEF-A consists of 75 items that comprise nine clinical scales: Inhibit, Shift, Emotional Control, Self-Monitor, Initiate, Working Memory, Plan/Organize, Task Monitor, and Organization of Materials. Table 2 presents a description of each subscale. These nine scales are summarized in two broader index scores, the Behavioral Regulation Index (BRI) and the

Table 1

*Demographic Data for Study Participants*

Characteristic	<i>n</i>	%	Characteristic	<i>n</i>	%
Gender			Race/Ethnicity		
Male	28	56	Caucasian/White	41	82
Female	22	44	Asian	4	8
Reported Disability <sup>a</sup>			Hispanic/Latino	3	6
ADHD	21	42	Other	5	1
Learning Disability	20	40	Class Standing		
Psychiatric Disability	12	24	Freshman	23	46
Chronic Health Condition	8	16	Sophomore	8	16
Autism Spectrum Disorder	2	4	Junior	3	6
Mobility Impairment	1	2	Senior	6	12
Deaf / Hard of Hearing	1	2	Graduate/Professional School	9	18
Blind / Visual Impairment	1	2	Other <sup>b</sup>	1	2

*Note:* <sup>a</sup>Categories are those used by the university disability resource center. Participants could identify with more than one disability category; <sup>b</sup>"Special Student," the term used by the study university to refer to those who take classes for credit but are not currently part of a degree program.

Metacognition Index (MI). The BRI measures one's ability to regulate emotion and behavior, while the MI measures one's ability to actively problem solve across a variety of situations. The summary score of all clinical scales is represented in the Global Executive Composite (GEC). This instrument also includes three validity scales: Negativity, Infrequency, and Inconsistency. The internal consistency of the BRIEF-A was classified as being moderate to high, with Cronbach's alpha coefficients spanning from .73 to .90 among the clinical scales and from .96 to .98 for the broader indexes and GEC. The BRIEF-A has been found to distinguish different patterns of responding between diagnostic groups including ADHD, Alzheimer's disease, mild cognitive impairment, multiple sclerosis, traumatic brain injury, and epilepsy.

### Procedure

After providing written informed consent, participants completed a demographic form and the BRIEF-A while in the disability resource center before or after a scheduled appointment, or at a different time convenient for the student, scheduled during the center's standard

weekday hours. All study materials were identified by study number with no identifying information aside from demographics, and participant files were stored separately from the disability resource center client file containing disability documentation and case notes. Participants were given the option of scheduling time with the staff psychologist or pre-doctoral psychology intern to discuss individual results.

### Data Analysis

Self-reported disability categories were the independent grouping variables of interest for this study and determined on the basis of demographic questionnaire responses. Groups included (1) male / female, (2) those who did / did not endorse ADHD as a disability category, (3) those who did / did not endorse having a psychiatric disability, (4) those who did / did not endorse having a learning disability, (5) those who endorsed a single disability category / multiple disability categories, and (6) freshman undergraduate students / all other university class standings. Small cell sizes for the categories of chronic health condition, autism spectrum disorder, mobility impairment, deaf/hard of

Table 2

*Domains of Behavior Rating Inventory of Executive Function–Adult (BRIEF-A)*

Domain	Description
Inhibit	The ability to resist impulses and the ability to stop your own behavior at the appropriate time
Shift	The ability to move with ease from one situation, activity, or aspect of a problem to another as the circumstances demand. Key aspects include the ability to (a) make transitions, (b) tolerate change, (c) problem-solve flexibly, (d) switch or alternate attention, and (e) change focus from one mindset or topic to another.
Emotional Control	The ability to modulate or control your emotional responses; reacting to events appropriately, without outbursts, sudden and/or frequent mood changes, or excessive periods of emotional upset
Self-Monitoring	Aspects of social or interpersonal awareness; the degree to which you are aware of the effect that your behavior has on others
Initiate	The ability to begin a task or activity and to independently generate ideas, responses, or problem-solving strategies
Working Memory	The capacity to hold information in mind for the purpose of completing a task, encoding information, or generating goals, plans, and sequential steps to achieving goals.
Plan/Organize	The ability to manage current and future-oriented task demands. Plan: The ability to anticipate future events, set goals, and to develop appropriate sequential steps ahead of time in order to carry out a task or activity. Organize: The ability to bring order to information and to appreciate main ideas or key concepts when learning or communicating information
Task Monitoring	The ability to keep track of your problem-solving success or failure, and to identify and correct mistakes during behaviors
Organization of Materials	The orderliness of work, living, and storage spaces; keeping belongings reasonably well-organized, and finding them when needed

*Note:* Adapted from Gioia, Isquith, Guy, & Kenworthy (2000)

hearing, and blind/visual impairment precluded specific examination of students who identified as having a disability in one of these categories.

Data were preliminarily examined for demographic differences. Age differences were tested via independent samples *t*-tests for each of the disability groupings. Chi-squared tests were performed to determine whether gender and race/ethnicity were proportionally distributed across disability groups. Total GEC scores were examined and interpreted categorically as an indication of overall executive impairment reported by students in each of the disability groupings.

Variable demographic groupings within the sample were compared via planned sets of independent sample *t*-tests to achieve the primary study aims. To limit the number of variables tested, the Behavior Regulation Index (BRI) and Metacognition Index (MI) were initially examined for significant differences. Scales within each index were only examined in the event of significant group differences between the BRI and MI. Overall alpha level was set at  $p = .05$ , which was used as the value for determining significant index score differences. Bonferroni adjustment was used in each instance that individual scale differences were examined. Therefore, scales within the BRI were evaluated at  $p = .0125$  and scales within MI were evaluated at  $p = .01$  to determine significance.

## Results

Preliminary demographic analysis revealed age differences in the ADHD and freshmen comparison groups, with older participants self-identifying as having ADHD,  $t(48) = 2.45$ ,  $p = .022$ , and having a class standing other than freshman,  $t(48) = -3.84$ ,  $p = .001$ . Gender was equally distributed within each of the disability groups. Participants who identified as a racial/ethnic minority were evenly distributed within each disability grouping, with the exception of the ADHD study grouping. In this grouping, participants identifying with racial/ethnic minority status were more likely to identify with a disability category other than ADHD, whereas Caucasian participants were evenly distributed between ADHD and other disability categories,  $X^2(1) = 4.30$ ,  $p = .038$ .

**Global Executive Composite.** The full sample of participants endorsed overall EF to be in the average range ( $M = 58.94$ ,  $SD = 11.47$ ). Table 3 presents the means and group differences for each study grouping.

Descriptively, male participants, those with ADHD, and those with a disability other than a learning disability endorsed an overall at-risk level of EF challenges. Participants with a psychiatric disability and those with upper class standings endorsed overall EF to be in the clinically significant range. Figure 1 depicts subscale and composite scores across ADHD, learning disability, psychiatric disability, and freshmen groups.

**Gender.** While both male ( $n = 28$ ;  $M = 56.14$ ,  $SD = 12.31$ ) and female ( $n = 22$ ;  $M = 51.95$ ,  $SD = 9.25$ ) ratings fell within the average range on BRI, male participants' mean MI fell in the at-risk range ( $M = 63.82$ ,  $SD = 12.11$ ), while the mean MI for female participants fell in the average range ( $M = 58.18$ ,  $SD = 11.32$ ). However, males and females did not differ on the BRI,  $t(48) = -1.33$ ,  $p = .191$ , or MI,  $t(48) = -1.68$ ,  $p = .099$ .

**ADHD.** Those who identified ADHD as a disability category had a BRI in the average range ( $n = 21$ ;  $M = 56.43$ ,  $SD = 10.69$ ), with a mean MI that fell in the clinically significant range ( $M = 67.86$ ,  $SD = 11.88$ ). Participants who did not identify ADHD as a disability category rated both BRI ( $n = 29$ ;  $M = 52.76$ ,  $SD = 11.42$ ) and MI ( $M = 55.31$ ,  $SD = 10.23$ ) to be in the average range. These groups did not differ on the BRI,  $t(48) = 1.15$ ,  $p = .255$ . MI was significantly higher in the ADHD group,  $t(48) = 3.66$ ,  $p = .001$ . Examination of MI scales revealed significant differences on Working Memory,  $p = .001$ , Plan/Organize,  $p = .003$ , Task Monitor,  $p = .003$ , and Organization of Materials,  $p = .008$ .

**Psychiatric Disabilities.** BRI scores were in the average range for those who reported having a psychiatric disability ( $n = 12$ ;  $M = 59.5$ ,  $SD = 11.78$ ) as well as those who did not ( $n = 38$ ;  $M = 52.66$ ,  $SD = 10.59$ ). The group who reported having a psychiatric disability had a mean MI that fell in the clinically significant range ( $M = 69.33$ ,  $SD = 10.39$ ) while the mean MI for those who did not report having a psychiatric disability fell in the average range ( $M = 58.82$ ,  $SD = 11.44$ ). While these groups did not differ with regard to BRI,  $t(48) = 1.90$ ,  $p = .063$ , MI was significantly higher within the psychiatric disability group,  $t(48) = 2.83$ ,  $p = .007$ . The metacognitive Initiate,  $t(48) = 2.67$ ,  $p = .010$ , and Plan/Organize scales,  $t(48) = 3.49$ ,  $p = .001$ , were rated significantly higher by those who identified as having a psychiatric disability.

**Learning Disabilities.** BRI was in the average range for those who reported having a learning dis-

Table 3

Study Group Comparisons of the Global Executive Composite (GEC)

Grouping	n	Global Executive Composite (GEC)		t	p	
		M	SD			
Gender	Female	22	55.82	10.18	-1.74	.088
	Male	28	61.39	12.00		
ADHD	Yes	21	63.95	11.41	2.81	.007
	No	29	55.31	10.23		
LD	Yes	20	52.75	7.59	-3.75	<.001
	No	30	63.07	11.85		
Psychiatric Disability	Yes	12	66.50	10.88	2.80	.007
	No	38	56.55	10.70		
Multiple Disabilities	Yes	15	58.80	13.00	-0.06	.956
	No	35	59.00	10.95		
Freshman	Yes	23	50.30	7.04	-6.83	<.001
	No	27	66.30	9.15		

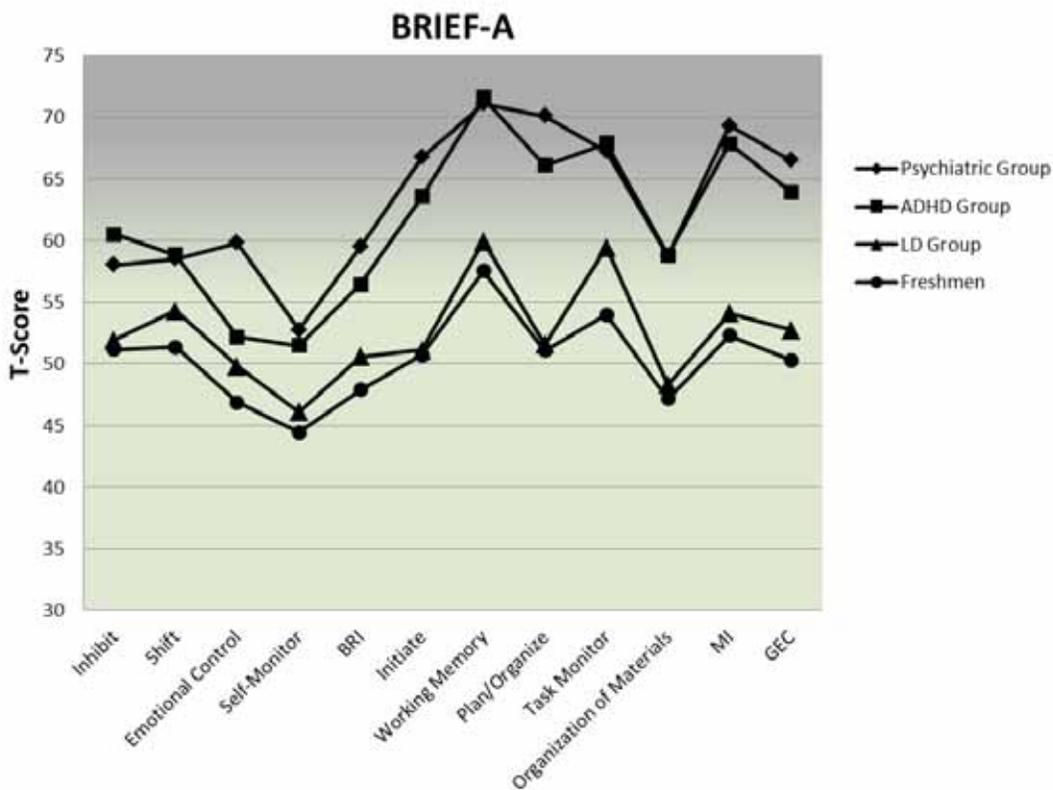


Figure 1. T-scores of study groups across BRIEF-A subscales and composites

ability ( $n = 20$ ;  $M = 50.60$ ,  $SD = 8.38$ ) and those who did not report having a learning disability ( $n = 30$ ;  $M = 56.77$ ,  $SD = 12.20$ ). MI was elevated in the clinically significant range for those who did not report having a learning disability ( $M = 66.17$ ,  $SD = 12.13$ ) and in the average range for those who reported having a learning disability ( $M = 54.10$ ,  $SD = 7.36$ ). These groups did not significantly differ on the basis of BRI,  $t(48) = -1.97$ ,  $p = .055$ ). Those with a learning disability reported significantly less frequent concerns regarding metacognition than students who reported disabilities other than a learning disability, MI  $t(48) = -4.37$ ,  $p < .001$ . Metacognitive scales that were rated significantly lower by those who identified as having a learning disability in comparison to those who identified with other disability categories include Initiate,  $t(48) = -4.65$ ,  $p < .001$ ; Plan/Organize,  $t(48) = -4.64$ ,  $p < .001$ ; and Organization of Materials,  $t(48) = -2.98$ ,  $p = .008$ .

**Multiple Disabilities.** BRI ratings were in the average range for those who identified with one disability category ( $n = 35$ ;  $M = 54.46$ ,  $SD = 11.22$ ) and those who identified with more than one disability category ( $n = 15$ ;  $M = 53.93$ ,  $SD = 11.41$ ). MI ratings for both of these groups fell in the at-risk range (Single Disability group  $M = 61.37$ ,  $SD = 11.55$ ; Multiple Disability group  $M = 61.27$ ,  $SD = 13.38$ ). Those who endorsed one vs. multiple disability categories did not differ by BRI,  $t(48) = -0.15$ ,  $p = .881$ , or MI,  $t(48) = -0.03$ ,  $p = .978$ .

**Class Standing.** Freshman undergraduate students endorsed average-range BRI ( $n = 23$ ,  $M = 47.91$ ,  $SD = 6.20$ ) and MI ( $M = 52.30$ ,  $SD = 8.22$ ). All other students endorsed average-range BRI ( $n = 27$ ,  $M = 59.74$ ,  $SD = 11.63$ ) but MI in the clinically significant range ( $M = 69.04$ ,  $SD = 8.94$ ). Scores were significantly different between these groups on BRI,  $t(48) = -4.37$ ,  $p < .001$ , as well as MI,  $t(48) = -6.84$ ,  $p < .001$ . Examination of scales within each index reveals significant differences across all scales, with freshman students rating themselves as having less frequent concerns than other students on all scales (MI scales  $p$  range .001 - .006; BRI scales all  $p < .001$ ). The largest magnitude of mean difference was on the Plan/Organize scale, with freshmen endorsing average range concerns ( $M = 51.09$ ,  $SD = 8.47$ ) and students other than freshmen endorsing concerns in the clinically significant range ( $M = 67.19$ ,  $SD = 11.56$ ). Other Metacognition subscales to fall in the clinically significant range for those other than freshmen were Initiate, ( $M = 66.41$ ,  $SD = 9.45$ ),

Working Memory ( $M = 71.59$ ,  $SD = 10.30$ ), and Task Monitor ( $M = 69.33$ ,  $SD = 7.89$ ).

## Discussion

### Major findings

Results suggest that college students identifying within ADHD and/or psychiatric disability (e.g., depressive and/or anxiety disorder) groups can be considered risk factors for perceiving more frequent difficulty with metacognitive skills. Students who identified within one of these disability groups reported more elevated concerns with EF compared to college students in other disability groups. Students who considered themselves as having a learning disability, however, did not report elevated difficulties with behavioral regulation or metacognitive skills, thus reporting significantly fewer and less frequent EF concerns than those who identified as having a disability other than LD. Somewhat surprisingly, identifying as belonging to more than one disability group did not have an additive effect on perceived EF challenges. Also surprising was the finding that freshmen reported significantly fewer EF challenges than students with higher class standings. While developmental evidence might suggest that younger students would have less-developed EF, an explanation for this finding may lie in the method of assessment rather than actual higher skills across the EF domains assessed. That is, freshman students may rightfully *perceive* themselves to have few EF challenges because they have had fewer instances of required independence for academic and self-management, problem-solving and formulation/execution of independent, goal-directed behavior. Older students who have been more academically and adaptively independent for a longer period, may conversely have a more accurate perception of their daily challenges with regard to EF.

### Implications for Research and Practice

The finding that freshman students perceive themselves to have fewer EF challenges has tremendous implications for postsecondary support staff. Concerted efforts can focus on preventing EF difficulties from arising by providing some level of scaffolding for postsecondary academic and independent living tasks while also increasing younger students' capacities for independent problem-solving around increasing task demands over time. This finding may indicate that

freshman students may need initial support and follow-up concerning issues of EF. Those working with college freshmen in disability settings might foster more robust EF skills by (1) helping to increase awareness of supports and resources available on campus that can aid students in increasing strategies of EF; and, (2) continuing to check-in with students as they progress through their college experiences about issues of EF as areas of perceived weakness may emerge later in an individual's academic career.

In the later years of college, students with disabilities may come to a more accurate understanding of their EF-related challenges, having experienced the multiple demands for independent problem-solving and work completion inherent to college. Given the common goal in work with postsecondary students with disabilities of increasing self-advocacy regarding disability-related needs, a more accurate self-perception can foster a more accurate assessment of related needs. However, disability support specialists should be mindful of the EF processes involved in self-advocating (e.g., planning how and when to communicate needs, regulating emotions related to seeking and accessing accommodations, following through in steps necessary in accessing accommodations, and self-monitoring changing needs over time). If perceptions of greater EF challenges do, in fact, emerge in the later college years, then support staff can utilize that information to facilitate students' successes in college and foreshadow, model, and role-play situations related to independent living and employment accommodations after college.

Indeed, the process of transitioning from high school to college and from college to the workforce or graduate school could be considered large-scale cognitive and behavioral shifting. With the knowledge that college students with particular disabilities might perceive immediate task-to-task switching to be challenging, the processes of transitioning to and from college represent ideal time periods to provide targeted support to college students experiencing such shifts. The current results also discovered significant differences when grouping individuals by disability. Further exploring these differences could be informative in identifying particular EF difficulties based on disability group and lead to more effective interventions and referrals. Also, pairing disability in conjunction with difficulties identified on the BRIEF-A domains may eventually further inform clinicians on the appropriateness of specific interventions. For example,

an individual diagnosed with Depression and having difficulties initiating may require different intervention than an individual with ADHD presenting with similar difficulties. While the BRIEF-A would likely not be used within a postsecondary disability services office as a diagnostic tool or as a primary decision-making method regarding eligibility for academic accommodations, its utility would likely arise for students who would benefit from individualized support in managing their EF challenges.

One fitting example of a support method that has recently increased in prevalence and for which the BRIEF-A could inform practice is that of "coaching" for individuals with ADHD, an intervention approach that has established both empirical (Kubik, 2009; Prevatt & Yelland, 2013) and qualitative evidence for its treatment utility (Parker & Boutelle, 2009; Parker, Hoffman, Sawilosky, & Rolands, 2011; Parker, Hoffman, Sawilosky, & Rolands, 2013). Much like coaching that occurs in sports or for general life or professional skills, ADHD coaching involves a focus on individualized goals within clients' daily lives, motivation-building, and assistance in addressing barriers. Each of these factors takes on a particular quality in relation to the features that define ADHD (i.e., inattention, distractibility, hyperactivity, and impulsivity) and the resulting challenges that people with ADHD might encounter in their lives can be highlighted with the BRIEF-A.

Using the instrument within a coaching model might assist in structuring communication between coach and student/client, thus acting as a mechanism for self-reflection and goal articulation. With the current results suggesting elevated perceptions of EF challenges in those students with ADHD and psychiatric disabilities – particularly with regard to metacognitive skills – a coaching model could be used to support students by assisting with concrete strategies that relate to individually-identified daily life tasks that are frequently challenging. For example, elevated domains of working memory, planning/organizing, and task monitoring might be addressed by specifically coaching students through concrete tasks and strategies such as (1) using self-talk on the steps necessary to complete a task, (2) developing a time line for completing multi-step tasks, and (3) establishing a plan for self- or external monitoring of task completion.

Whereas motivation and self-determination are central factors of ADHD coaching, the finding that EF

ratings were elevated within the older student group is both in line with developmental readiness to recognize EF-related challenges and to initiate behavioral changes given the higher stakes of academic success with the looming prospect of post-college independence. While the coaching framework has been highlighted as an applicable approach for utilizing the results of the BRIEF-A, it is important to note that behavioral coaching can be appropriately used in conjunction with other intervention strategies such as cognitive-behavioral therapy, psychoeducational programming, and/or pharmacological intervention as appropriate for each student (Kubik, 2010).

### **Limitations**

Several issues require particular attention. First, although attempts were made to include a larger sample size, this proved to be more challenging given the dual roles of the authors (i.e., clinical staff within the Disability Services Office and researchers) and the commitment to follow the specific IRB guidelines related to recruitment of study participants (University of Wisconsin Education Research and Social & Behavioral Sciences, Internal Review Board, 2012). Second, of the 50 participants in the study 23 were freshman, who for the most part completed the BRIEF-A during the very beginning of their college experience, the first week of classes. While all participants completed the BRIEF-A independently at the Disability Services Office, the vast majority of freshmen did so within a group setting similar to a seminar style class with an authority figure present. All other participants completed the BRIEF-A either individually or with one other person, the Accommodation Specialist, also identified in a position of authority. The strong preference is to implement consistent methods throughout the study minimizing the chance for confounding factors. Finally, a control group of postsecondary students without a disability would have likely provided more robust information regarding the impact of EF both in terms of disability related issues as well as developmental factors for postsecondary students regardless of disability status.

### **Future Directions**

Future studies should attempt to recruit more diverse samples to continue to explore potential group differences within postsecondary disability populations as well as the utility of the BRIEF-A in larger and dif-

ferent disability populations. As the current sample was conducted at a large Midwestern university and included a majority of Caucasian/White students, it would be useful to further determine the utility of the BRIEF-A in other postsecondary settings (e.g., institutions with varying missions, sizes, locations) and greater variation among study participants in terms of, for example, ethnicity, class ranking, and disability.

Another area of future study is to explore the stability of BRIEF-A domains over time. The current study results indicated that significant group differences existed between college freshmen versus other class standings in regards to EF. A potential follow-up study would be to monitor BRIEF-A responses at the individual level over the course of enrollment to determine if fluctuations occur in relation to an underlying developmental process as individuals progress through college. The construct of self-awareness, a possible basis to the EF differences between college freshmen and other class standings, should be further studied by use of additional self-report measures of self-perception and informant report in conjunction with the BRIEF-A to determine the relationship of self-perception and BRIEF-A profiles.

Investigating response patterns of postsecondary students with disabilities on the BRIEF-A pre- and post-intervention is a future direction that can further explore the clinical utility of this instrument as well as the effectiveness of various interventions on improving EF over time (i.e., coaching, cognitive-behavioral therapy, psychoeducation, and/or pharmacological intervention). With increased knowledge regarding the utility of the BRIEF-A as an instrument to increase self-awareness and monitor progress of a targeted intervention, EF factors may be more routinely and widely considered in postsecondary disability service delivery. With expanded evidence and disseminated information about assessment utility and intervention effectiveness, a wider spectrum of students – both with and without disabilities – may benefit from a broader focus on EF factors in college students.

The present study provides a basis for expanding future research in the area of understanding self-awareness and perception of executive function among postsecondary students. As well, this study promotes the BRIEF-A as an informative measure of EF and a helpful intervention tool with postsecondary disability populations. Though additional research is necessary to further delineate the clinical utility of the BRIEF-A,

current results are promising in how this instrument might be of use to clinicians and staff within disability resource centers. Furthermore, future focus on the EF construct may further elucidate impact within disability groups and suggest more specific interventions for accurate self-perception of EF and appropriate interventions for supporting postsecondary students with disabilities.

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# Coaching and College Success

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## Abstract

Students with learning disabilities (LD) and Attention Deficit/Hyperactivity Disorder (ADHD) represent the largest segment of college students with documented disabilities. Despite enhanced access to accommodations under the Americans with Disabilities Amendments Act, this growing population continues to take longer to complete a college education and drop out at higher rates than peers without disabilities. This population has deficits in the important executive functioning and self-determination skills needed for success in college. Most college-based interventions are not targeted at improving these skills. Coaching is a promising service delivery model that institutions of higher education are beginning to provide to students with LD and ADHD. This study used a mixed methods research design to investigate coaching's influence on factors that contribute to executive functioning and self-determination skills which may underlie academic success and overall life functioning of college students with ADHD and LD. Results indicate that coaching is a promising practice for this population and that it improves students' self-awareness, self-management skills, and subjective well-being. Implications for future research on coaching and campus practices are discussed.

*Keywords: ADHD, LD, coaching, college success*

A college degree is strongly associated with a better quality of life for individuals with and without disabilities (Porter, 2002; Tagayuna, Stodden, Chang, Zeleznik, & Whelley, 2005; U.S. Census Bureau, 2002). However, the number of high school students with disabilities attending college in the United States remains relatively low. Estimates suggest that youth in the general population are four times more likely to enroll in a four year college than youth with disabilities (Wagner, Newman, Cameto, Garza, & Levine, 2005). Only a fraction of students with learning disabilities (LD) and/or Attention-Deficit/Hyperactivity Disorder (ADHD) are likely to enroll in higher education in spite of having average to above average intelligence (Cortiella, 2009; Frazier, Youngstrom, Glutting, & Watkins, 2007; Murphy, Barkley, & Bush, 2002). Regardless, students with learning and attentional disabilities are the fastest growing population of students

with disabilities on college campuses (Harbour, 2004; Henderson, 2001). Between 1988 and 2001 the number of college freshmen reporting having LD rose from 16 to 40% (Henderson, 2001).

## Barriers to Postsecondary Success

Unfortunately, students with ADHD/LD face many barriers in college. Murray, Goldstein, Nourse, and Edgar (2000) reported that students diagnosed with LD were less likely to graduate from four year colleges than their peers without disabilities. Blackorby and Wagner (1996) reported that 14% of high school graduates with a disability obtain a postsecondary degree two years after high school whereas their counterparts do so at a rate of 53%. Within three to five years, those numbers rose to 27% and 68% respectively. Another study suggests that students with disabilities obtain a college degree at a rate that is about 12% lower than

other students (U.S. Department of Education, 2000). Students with ADHD/LD may graduate at even lower rates than students with other disabling conditions (A. D'Amico, personal communication, January 29, 2008). It has also been posited that students with ADHD/LD may graduate at similar rates but it may take them longer than their non-disabled peers (Wessel, Jones, Markle, & Westfall, 2009).

Research suggests that students with LD/ADHD have more academic, social, and emotional difficulties, which may impact graduation rates. Academic and study skill weaknesses place them at risk for lower grades, higher rates of academic probation, and becoming academically ineligible (DuPaul, Weyandt, O'Dell, & Varejao, 2009; Frazier et al., 2007; Gregg, Hoy, & Gay, 1996; Heiligenstein, Guenther, Levy, Savino, & Fulwiler, 1999; Heiman & Precel, 2003; Rabiner, Anastopoulos, Costello, Hoyle, & Swartzwelder, 2008). Although emotional and social challenges may be commonplace for all college students (Kadison & DiGeronimo, 2004; Seiben, 2011), research indicates that these issues are more pervasive for students with ADHD/LD. Students with ADHD have a high rate of co-morbidity with psychiatric diagnoses such as depression and anxiety that can impact persistence in college (Barkley, Murphy, & Fischer, 2007; Norwalk, Norvilitis, & MacLean, 2009). Additionally college students with ADHD/LD tend to have a lower self-concept, which may complicate their adjustment to daily stressors (Barkley et al., 2007; DaDeppo, 2009; Norwalk et al., 2009; Shaw-Zirt, Popali-Lehane, Chaplin, & Bergman, 2005). Research has identified executive functioning and self-determination as two processes that can minimize the academic, social, and emotional barriers in college settings. A better understanding of these processes can help identify targeted interventions that may help improve the postsecondary outcomes of students with these disabilities.

### **Executive Functioning & Self-Determination Skills**

As students with ADHD/LD strengthen their executive functioning and self-determination skills, they are more likely to succeed in rigorous educational environments (Field, Sarver, & Shaw, 2003; Meltzer, 2010). Executive functioning permits individuals to be self-directed; that is, to freely choose their thoughts and actions to solve problems, select goals, make plans to implement goals, and activate, inhibit, monitor, redirect and manage themselves (Baddeley, 2003;

Barkley, 1997; Gioia, Isquith, & Guy, 2001). Executive functioning is an umbrella construct reflecting self-regulatory functions that organize, direct, and manage other cognitive activities, emotional responses, and behaviors (Gioia et al., 2001). The fields of neurology and neuropsychology have accepted that these cognitive processes are neurologically based (Pennington, 1991). Barkley's (1997) work dramatically shifted the view of ADHD from that of a deficit in attention to that of impaired executive functioning; thus tying the disability to deficiencies in everyday thinking processes needed for self-regulation. Similarly, individuals with LD demonstrate deficits in executive functioning (Katz, 1998), evidenced by their struggles with organization and self-management. Denckla (2007, p.8) identifies deficits in executive functioning as the "bridge" binding together the definitions of the two disabilities.

It is understandable why students with executive functioning impairments experience significant difficulties with organization, time management, goal setting, and stress management during their transition to college. The postsecondary environment is characterized by reduced external structures and increased demands on an individual's internal organization and self-management (Katz, 1998). Deficiencies in problem solving, decision making, and inhibitory functions (Biederman et al., 2004; Brown, Reichel, & Quinlan, 2011; Meltzer, 2010) can result in a host of academic, social, and emotional challenges that can result in a lower quality of life.

Because of the difficulties in academic, emotional, and social functioning coupled with pervasive problems in their executive functioning skills, students with ADHD/LD can become overly-dependent on external structures in the environment (Brinckerhoff, McGuire, & Shaw, 2002; Quinn, Ratey, & Maitland, 2000). To combat this pattern, the literature promotes services that facilitate growth in students' self-determination. Field and Hoffman (1994) defined self-determination as "the ability to identify and achieve goals based on a foundation of self-awareness and self-esteem" (p. 164). Self-determination has been compared to autonomy, and is believed to enhance independence and quality of life (Field et al., 2003; Wehmeyer, 1996).

Interventions that promote self-determination are positive and collaborative in nature, fostering security while also providing freedom of choice versus directive, critical, or controlling counsel (Field et al., 2003; Ryan & Deci, 2000). Studies have demonstrated that

successful students and adults with LD exhibit strong self-determination skills. These people are more self-aware, proactive, goal and action oriented, adaptable, and able to exert self-control (Raskind, Goldberg, Higgins, & Herman, 1999; Reiff, Gerber, & Ginsberg, 1993; Wehmeyer, 1996).

A significant relationship has been found between self-determination skills and both, GPA and retention rates for college students with disabilities (Jameson, 2007; Sarver, 2000). Students with disabilities have identified self-determination skills as critical to their academic success in college (Getzel & Thoma, 2006, 2008; Parker & Boutelle, 2009), specifically self-awareness, problem solving, goal setting, and self-management skills which include managing emotions, organizing time and possessions (Field & Hoffman, 1994; Getzel & Thoma, 2006, 2008). College students have also expressed a wish to have learned more self-determination skills prior to their postsecondary experiences (Getzel & Thoma, 2006, 2008).

### **Postsecondary Interventions**

Students diagnosed with ADHD/LD often experience barriers to academic and social success in college. Effective interventions can improve the likelihood of student retention and graduation. All postsecondary institutions are legally mandated to provide “reasonable accommodations” for otherwise-qualified students with disabilities. For college students with LD/ADHD this typically translates to extended test time, provision of a separate testing space, the use of a computer for essay exams, and the provision of class notes or audio versions of reading assignments. These accommodations are designed to create environmental modifications that do not alter essential elements of the course or program, but are not intended to teach students skills or minimize their need for such accommodations (Brinckerhoff et al., 2002). Anecdotal information from students suggests that these accommodations may not be enough when they lack the academic or social skills needed to succeed in the rigorous college setting (Field et al., 2003).

Many colleges and universities do offer academic support services above and beyond the legal mandates (Brinckerhoff et al., 2002). In most cases, these are didactic interventions such as content tutoring or learning strategies instruction that may be available to any student attending classes on that campus. These interventions provide alternate and sometimes crucial support for students who benefit from having someone

reteach course concepts or model a series of study skills steps that are then repeated in the same sequence (Allsopp, Minskoff, & Bolt, 2005). Students with executive functioning deficits may already possess effective learning strategies or have the ability to study class notes in order to learn course content. As Barkley et al. (2007) noted their need is being able to employ existing skills at the “point of performance.” They need assistance “not in knowing what to do but in doing what they know” (Barkley, 1997), or self-regulating throughout the week to maintain progress in meeting academic goals across time. The emerging research on coaching suggests that this new service delivery model may be more efficacious than didactic models and accommodations in helping students with ADHD/LD learn how to self-regulate (Griffiths & Campbell, 2009; Parker & Boutelle, 2009).

### **Coaching: A Promising Intervention**

According to the International Coach Federation, coaching is “partnering with clients in a thought-provoking and creative process that inspires them to maximize their personal and professional potential” (International Coach Federation, 2011). Coaches empower the client to select the agenda for the coaching relationship and to design each session. In this collaborative relationship (Whitworth, Kimsey-House, Kimsey-House, & Sandahl, 2007) coaches refrain from telling coachees what to do. Instead, they engage in active listening and promote self-discovery and action by posing meaningful questions designed to trigger a client’s deeper critical reflection. Coaches also hold the client accountable for following through on goals, plans, and commitments in a non-judgmental manner which promotes learning about what helped and what hindered the actions in between sessions (Quinn et al., 2000; Whitworth et al., 2007).

Coaching was introduced in the 1990s as an adjunct to the treatment of ADHD in adults and has since grown substantially (Hallowell & Ratey, 1994; Sleeper-Triplett, 2010). Based on tenets of positive psychology (Frederickson, 2001; Kaufmann, 2006; Seligman, 2002; Seligman, Steen, Park, & Peterson, 2005), coaching focuses on what is “going right” with the coachee and shifts the focus from pathology and healing to helping clients enhance his/her strengths and possibilities. Understandably, coaching has been termed a “wellness” model that helps clients live a more balanced and fulfilling life (Jaksa & Ratey, 1999).

Coaching has been criticized due to a lack of empirical support in spite of its popularity (Goldstein, 2005). Only a handful of studies have investigated coaching's impact on college students diagnosed with LD/ADHD and one published study has researched the use of coaching with first-year students for improving retention and graduation rates. This research has reported positive outcomes by depicting coaching's ability to influence growth in students' learning strategies, self-regulation skills, and their overall academic proficiency (Field, Parker, Sawilowsky & Rolands, 2010; Parker & Boutelle, 2009; Parker, Hoffman, Sawilowsky, & Rolands, 2011a, 2011b; Reaser, 2008; Swartz, Prevatt, & Proctor, 2005; Zwart & Kallemeyn, 2001). In addition, coaching has been found to enhance students' subjective well-being, or their ability to manage daily stress while maintaining optimism about their capacity to meet their goals (Field et al., 2010; Parker & Boutelle, 2009; Parker et al., 2011a, 2011b; Reaser, 2008). In a recent study with non-traditional first-year college students who did not report any disabilities, students who were coached were more likely to persist in college. This difference continued after 6, 18, and 24 months and participants were more likely to graduate. The researchers found that coaching had a statistically significant impact on retention/graduation rates of these students (Bettinger & Baker, 2011).

### Gaps in the Literature

Many limitations exist in the small but growing literature that has investigated coaching's impact on college students. To date, only one study has used a randomized control group design to investigate relationships between coaching and possible improvements in executive functioning skills with ADHD/LD students. Field et al. (2010) found that college undergraduates with ADHD who received two semesters of coaching on ten different campuses made significantly larger gains in self-regulation skills and subjective well-being compared to undergraduates with ADHD who were not coached. These findings need to be replicated on other campuses and better understood with longitudinal research. Although several coaching studies have used self-determination as an outcome, only one has reported the use of a specific self-determination measure (Parker & Boutelle, 2009).

In addition, it is not clear whether existing studies of coaching have investigated the same model of coaching; published studies vary in amount of detail

provided about specific components of coaching, including the levels and types of training employed by the coaches (Field et al., 2010; Swartz et al., 2005). No studies investigated coaching's efficacy with graduate students or postsecondary students from diverse backgrounds or students diagnosed with LD who have been found to also struggle with executive functioning skills (Denckla, 2007). Most studies to date focus only on full-time undergraduates diagnosed with LD/ADHD (Field et al., 2010; Parker & Boutelle, 2009; Parker et al., 2011a, 2011b). Finally, it appears that no published studies of college coaching have employed highly trained, campus-based coaches. The current study attempted to fill some of these gaps in the coaching literature.

## Methods

### Research Questions

The research team explored the following four research questions:

1. Does coaching increase participants' level of self-determination?
2. Does coaching improve participants' executive functioning skills?
3. Does coaching improve participants' overall academic skills?
4. From students' perspectives, what are the benefits and limitations of coaching?

### Sample

A self-selected, convenience sampling technique was employed to investigate the treatment effects of the coaching intervention. Participants included undergraduate and graduate students who were eligible for services at an office for students with LD/ADHD disabilities at a large public university in the southern United States. In order to receive services, students are required to submit documentation that they have been diagnosed with a learning disability (LD), Attention-Deficit/Hyperactivity Disorder (ADHD), or both. 24 of 26 participants remained in the study until its completion. Several participants had comorbid diagnoses as well. The final sample consisted of 12 males and 12 females. The group's relatively diverse demographic characteristics were reflected in their ethnicities (18 white, three black, two Asian/Pacific Islander, one "other") and the inclusion of 17 undergraduates and seven graduate students (see Table 1). A purposive

sample of six treatment group participants were chosen for qualitative interviewing at the end of the study (see Table 2). These six students were selected to represent a broad range of the following characteristics: gender, diagnoses, graduate/undergraduate level, race, and GPA.

### Study Design

Researchers used a nonequivalent groups quasi-experimental design, to investigate the impact of coaching services on the executive functioning, self-determination, and academic success. All 500 students who were receiving services at the university's LD/ADHD office were invited to participate in this study. Students could volunteer to be in the treatment group, comparison group, or to not participate at all. There were 16 students in the treatment group (eight per coach) and eight in the comparison group. Each student in the treatment group received between 12 and 24 coaching sessions over two successive semesters, and was assigned to one of two trained coaches. Both coaches were certified by the Coaches Training Institute, one of the founding coaching training programs in the country, and have been practicing for several years. This training required completion of five coaching courses (116 hours of training) and a six month in-depth certification program. Coaches assisted students in setting specific and measurable goals for their lives while helping them develop action plans to reach those goals. Students were held accountable for implementing their plans and encouraged to reflect on what helped and hindered their progress. Rather than provide solutions, coaches used broad questions to encourage student reflection. Session notes were reviewed for consistency of technique four times throughout the study.

Due to ethical concerns, researchers did not control for the assignment to groups using random assignment. Withholding coaching from students who qualified for this service was considered ethically questionable, and services offered at a university are required to be available to students at all times. The self-selected groups could have been meaningfully different prior to the study, consequently, which would threaten internal validity and preclude the determination of casual inferences.

### Data Collection

Treatment group participants attended approximately 6-12 weekly coaching sessions for two 12 week semesters. These 30 minute sessions took place on

campus in person or via the telephone. Students worked with their coach to develop systems and structures to reach their goals and agreed to be held accountable for their commitments. A non-coach researcher conducted four fidelity checks by monitoring all session notes written for study participants. Checks were conducted, twice each semester to ensure that both coaches used the agreed upon coaching techniques and focused on goals that were established by the student.

Prior to the implementation of the coaching intervention, all participants were asked to complete three surveys. All three instruments were tested in a pilot study to ensure that their use was appropriate with this population. The same instruments were used as post-test measures at the end of the study. Reminder emails were sent to students at the beginning and end of the study when it was time to complete these instruments and all students received small incentives (five dollar gift cards for the university student store) for their participation.

Each qualitative interview was done in person by the same non-coach researcher for one hour. The 12 questions generated by the research team pertained to their perceptions about the impact of coaching on their self-determination, executive functioning, and academic success (see Figure 1). Conversations were audio recorded and then transcribed for analysis. The data were analyzed for pertinent and meaningful themes by two researchers to ensure inter-rater reliability; 89% agreement was reached.

### Measures

Measures were chosen based on theoretical underpinnings of what is known about LD/ADHD, coaching, and how these variables can influence the academic and social-emotional experiences of college students. Our dependent variables, student's levels of *self-determination*, *executive functioning*, and *academic skills*, were measured using existing and validated instruments that have been used in numerous other research studies.

The first instrument, the Self-Determination Student Scale ([S-DSS]; Hoffman, Field, & Sawilowsky, 1995, 2004) measures the extent to which a student makes choices according to an awareness of his or her own personal needs or by acting as his or her own primary decision maker when determining actions and responses to life events. The second instrument, the Behavior Rating Inventory of Executive Function-Adult

Table 1

*Sample Characteristics*

Variables	Population (n=24)	
	n	%
Sex		
Male	12	50.0
Female	12	50.0
Status		
Undergraduate	17	70.8
Graduate	7	29.2
Race		
Black	3	12.5
White	18	75.0
Asian/Pacific Islander	2	8.3
Other	1	4.2

Table 2

*Qualitative Sample Characteristics*

Variables	Population (n=6)	
	n	%
Sex		
Male	3	50.0
Female	3	50.0
Status		
Undergraduate	3	50.0
Graduate	3	50.0
Race		
Black	2	33.3
White	3	50.0
Asian/Pacific Islander	1	16.6
Disability		
LD	2	33.3
ADHD	3	50.0
Both LD & ADHD	1	16.6
Co-morbid Diagnoses		
Yes	4	66.6
No	2	33.3

([BRIEF-A]; Roth, Isquith, & Gioia, 2005), measures executive functioning, which is a cognitive process of self-regulation that helps a person manage his or her resources in order to achieve a goal. The third instrument is the Learning and Study Strategies Inventory ([LASSI]; Weinstein, & Palmer, 2002), measures beliefs and behaviors related to academic success.

## Results

The research methods, including both quantitative and qualitative techniques, were designed to allow the researchers to measure changes in the pre- and post-intervention survey scores and capture self-reported student insights about coaching in real time. Unfortunately, this study had an extremely small sample size and did not yield statistically significant quantitative outcomes. The qualitative interviews however, offered a rich and detailed understanding of students and their experiences and thus, the majority of the results are focused on the qualitative data. In the fidelity checks, no

disparities were found between how coaches conducted their sessions and the coaching model. Below, results of each research question are addressed followed by a case study.

It is noteworthy to mention two findings uncovered in the quantitative analysis. First, every student who self-selected to be in the intervention group began the study with lower pretest scores than comparison group students in all three measures. Second, the posttests revealed that all intervention group students improved in every post-test measure and except in one case, to a greater extent than the comparison group. While the t-tests did not yield significant results, the patterns indicate that upon further research using larger, randomly assigned groups, coaching will likely be shown to be an effective intervention technique for improving experiences of college students with LD and ADHD.

### **Research Question 1: Does coaching increase participants' level of self-determination?**

The thematic analysis of qualitative interview tran-

- 
1. What impact, if any has coaching had in helping you learn more about your strengths and weaknesses?
    - Could you give me some examples of when that happened?
  2. What are the major advantages that coaching offers you?
  3. When people choose their own goals and make their own decisions, they are said to be 'autonomous.' Could you talk a little about whether coaching has had any impact on your autonomy?
  4. I am curious to know if you think that coaching has influenced your self-esteem or how much you value yourself?
    - Do you value yourself any more, or in different ways, than you did before you started coaching?
  5. Please tell me about 1 or 2 goals you have worked on during coaching.
  6. With those goals in mind, what role if any has coaching played in helping you to achieve those goals?
    - Has coaching changed anything about how you work on your goals?
  7. In last year's study students indicated that they thought and felt differently about approaching a difficult task or a big project after experiencing coaching. Does that surprise you? Why/why not?
  8. Has coaching influenced how you use self-talk or how you think to yourself?
    - Could you give me 1 or 2 examples of this?
  9. Has coaching had any impact on how you manage your mood or emotions?
    - Are there any new behaviors developed from coaching that you use continually?
    - Can you give me a situation when you found yourself more self-aware or able to observe your own behavior?
  10. Beyond your experiences as undergrad/graduate student, I wonder if you can give me an example of how coaching has impacted other parts of your life
  11. If someone was going to write a story about coaching's impact on your overall life, what would be a good title?
  12. If you had to redesign coaching so that it was more effective for you, what changes would you make?

*Figure 1. Qualitative Interview Questions.*

scripts enriched the researchers' understanding of how coaching influenced students' self-determination. Specifically, students reported that coaching enhanced their self-determination in five ways. The intervention enhanced their autonomy by promoting their self-awareness, bolstering their self-esteem, increasing their effectiveness in working toward goals, strengthening their ability to establish more realistic goals, and encouraging their critical reflection on their goal-attainment efforts.

A sampling of comments illustrates students' reflection on their experience with coaching and its impact on their self-determination. Students' names have been replaced with pseudonyms to protect their confidentiality. Heather, a graduate student with ADHD, anxiety, and depression sought coaching to help her manage multiple responsibilities (coursework, job, and internship). Here, Heather directly links coaching to better self-esteem:

So [coaching] has helped my self-esteem in the way that it has shown me something that I found to be very true, which is when I do what I'm supposed to do and make responsible decisions, ultimately I feel better about myself because it helps me to be successful, right? And when I choose to procrastinate and not do the work that I'm supposed to do or put off deadlines or cram for a test the night before or stuff like that, it makes me feel worse about myself because my performance is not up to par.

Heather describes how coaching has helped gain confidence in communication, a long-standing difficulty for her.

I've had some communication issues, a lot of them fear-based. Difficulty communicating with anywhere from my peers, all the way up to professors and on up to administrators...I'd rather ignore the problem or just not talk to them at all or wait until they contact me or whatever. And, I've gained confidence over time by developing goals with my coach.

Michelle, a graduate student with ADHD, also sought coaching to help her manage numerous responsibilities of her program (coursework, job, and research assistantship). Michelle had several Incomplete grades from

previous semesters, so, part of her coaching focused on strategies to help her catch up while also remaining current with that semester's courses. Michelle discussed her strengthened ability to work more effectively towards goals as the result of working with her coach:

My coach showed me how to have a plan and that if I have that plan, I can work through pretty much anything and set goals...and follow through in projects... So [one of the calendars we use shows] the whole semester...on one page. She calls that the "road map;" we put big things on that calendar. So the way I look at [assignments and projects] now are kind of like, "Okay, this is really four weeks away instead of this arbitrary number in my head." I've been able to see things clearly [with this planning tool].

As for setting reasonable goals, Michelle continues:

Having [a coach] really helps me have manageable goals. Whereas in the past, I probably have taken on chunks and didn't realize... It would just be too much in the end and I would kind of break down.

Michelle has been able to apply self-advocacy skills gained in coaching to her personal life as well.

So I think I've communicated with my husband better through her, through coaching as far as, "I need this; let's sit down and talk about this." For example, last week, I went to [coaching] three weeks ago and then we had spring break. I invited some people over and I'm normally the one trying to clean and cook and I felt overwhelmed. And so, I stopped and asked my husband for help and it was so much better... So a lot of times now I look at the things and I'll say, "Is this worth my time?" or "Is there something else I need to be doing?" or "Can I ask him for help?"

### **Research Question 2: Does coaching improve participants' executive functioning skills?**

Interview data produced many examples of how students believed that coaching enhanced their executive functioning skills. Overall, students discussed six ways that coaching helped them improve how they

managed themselves and their resources in order to achieve their goals. Participants indicated an improvement in self-talk, an executive function skill in which one uses covert or overt speech to manage emotions and problem-solve (Depape, Hakim-Larson, Voelker, Page, & Jackson, 2006; Duncan & Cheyne, 1999). Barkley (1997) and others contend that many individuals with ADHD are delayed in their internalization of effective self-talk as they grow into adulthood. In addition to self-talk, students also cited improvements in five other executive functioning skills: regulating their emotions, engaging in effective problem solving, developing clearer plans, creating a more balanced and fulfilling life, and initiating and persisting at tasks more consistently.

Comments below illustrate students' reflections on their experience with coaching as it relates to executive functioning. Here, Heather described her growing ability to use self-talk to redirect her behavior:

...over time, having talked to [my coach] so many times about [dealing with distractions], she has led me to realize, to become self-aware at the moment when I'm moving the mouse to click on the tab that says Facebook. Or to open the game. She says, "You are making a conscious decision to not do what you intended to do in that study session." [Now] when I'm about to open... a goof-off page... this feels a little uncomfortable. It's not as easy as before [coaching], when I'd just blame it on, "Oh, I get really distracted." Now it's like, "I have to take accountability for it." And it's a big difference than what it was before.

Heather also described her ongoing issues with procrastination which often leads to feelings of remorse and even shame. Coaching has helped her manage her negative self-talk about procrastination:

I go through phases of a lot of negative self-talk. But whenever I admit to it to my coach and say, "I've been thinking these things, like I'm a failure and I'm not like any of the other students, or I'm never going to get through school," or things like that. Now, I know that when I start talking that way, a little red flag pops up. I know that's not the right way to talk to myself, through lots of time talking to my coach. That's the cool thing, that a little red flag pops up and I know how to replace

those thoughts with positive self-talk, affirmations or, "I know that I can do this." Some days are easier than others. Usually those thoughts do come back after being gone for a while. Through coaching, I have the tools to battle it, so that's cool.

Tim, an undergraduate student with ADHD, also believes that coaching has also helped him not stay discouraged for too long when he hasn't followed through with plans.

I guess [coaching] may have removed the guilt. You know, you waste a Saturday, you play video games, you watch basketball, and you do absolutely nothing. That's not something to be humiliated over and you can't dwell and can't let yourself be damned for one bad day.

Josh, a post-baccalaureate student with ADHD and bipolar disorder, described coaching's ability to help him problem-solve more effectively:

For example, one of my weaknesses is forethought. So when it comes to preparing for something, I don't necessarily always allot enough time or take the amounts of time to consider all the variables involved.. The ability to kind of lay it out [in coaching] really helped me improve that. Also... just having that ability to say, "Alright, Josh, let's think through the entire process and preparation." So that's one positive change that I've noticed as a result of focusing on my weaknesses.

Josh continues by describing how coaching helped him problem-solve around mood-management:

For example, October and February are just notoriously bad for me. So [learning] how can I plan for that ahead of time has been really effective. And also just not feeling like I'm a victim to my mood. I love to write and I write my best stuff when I'm depressed. So that's just one of those empowering things that I do now that, "Okay, I'm in this mood. Why don't I just go ahead pull out a journal and start writing?"

### **Research Question 3: Does coaching improve participants' overall academic skills?**

Students talked at length about how coaching

helped them improve skills that can enhance academic success in a postsecondary setting. They identified six broad ways that coaching helped them improve academic skills, including improved self-advocacy, improved grades and GPA, help with writing papers, increased persistence with college and maintaining full-time enrollment status, improved study skills, and an improved ability to submit assignments on time. A variety of comments portray students' perceptions about coaching's impact on their academic skills. Here, Josh described how coaching helped him proactively communicate with professors about progress on papers:

And it turns out, turning in papers on time – one of the biggest strengths was when to ask for help. I think generally I would have waited until after the deadline to see the flags and say, “Hey, I really need help.” But coaching kind of allowed me to be a little bit more proactive and create a conversation with my professors even if things aren't on time and still within a reasonable time frame that's agreed upon by both parties.

Adam, an undergraduate with ADHD, depression, and Asperger's Syndrome, relayed how coaching was a key factor in improving his academic standing. He enrolled in coaching after he was placed on academic probation:

[Coaching] had a tremendous impact. I went from below a 2.0 [GPA] student who was on the verge of dropping out to somebody who has totally acceptable grades, G.P.A., social life, academic and extracurricular involvement. Even though I don't think the coaching itself was entirely attributable to all the changes that happened, I think it was one of - if not the - most important factors that kind of started the cascade of good, positive things that started happening for me. Since then I have had 3 semesters and during the summer I took three classes and got A's in all of them, had a 4.0 semester, and this most recent semester I had a 3.25 semester. There were pretty drastic changes, so that's the biggest goal that I've had.

**Research Question 4: From the students' perspective, what are the benefits and limitations of coaching?** During the qualitative interviews, a member of the research team asked students to identify the overall

benefits and limitations of coaching. Students identified an array of positive outcomes after experiencing coaching. While far fewer in quantity, their comments also point to several limitations.

Students' comments about coaching's benefits can be categorized into three broad themes: improved cognitions, behaviors, and subjective well-being. Students described how coaching impacted their cognition by helping them develop critical thinking skills. Because coaches ask students to evaluate their weekly progress and struggles, they gained practice in the habits of self-reflection that helped them think critically when planning for the following week. Coaches also asked students to consider alternative solutions to problems, giving them practice in thinking flexibly.

Adam described the impact of coaching on his ability to consider alternative perspectives. He worked with his coach on social concerns, which helped him think differently about his interactions with other people:

[Coaching helped me] expose myself to social situations that I was uncomfortable with. And especially a huge thing was dealing with rejection or perception of rejection and not have it ruin me, not have it ruin my subsequent interactions. And not have it form the basis of what I thought about people as a whole and about women that I found attractive. It was more of a secondary purpose, a secondary goal, than academic but it was also vitally important, in my opinion, and we worked on it. The progress in this is kind of harder to measure but I feel like it's been helping.

Josh stated that coaching helped him enhance his proficiency with self-reflection:

I know personally, for me, especially since I'm a part-time graduate student, you can kind of get lost in the shuffle. But for the most part, coaching allows you some form of weekly communication. And not only does that let you know someone's thinking about you, but also it forces you to kind of think about yourself. And that's really crucial when it comes to making yourself accountable to your progress.

In terms of thinking critically when planning, coaching has also positively impacted Josh:

I think one of my difficulties is that I do like to set goals and have a game plan, but it's usually unrealistic. So coaching has been effective to help me refine and re-regulate what my goals are and, more importantly, create the action items that will help get me to my goals.

Students' comments also illustrated how coaching impacted their behaviors, the second broad theme found in coaching's overall benefits. Students' comments captured an improved ability in taking effective action on both life and academic goals. In several cases, students also described progress in taking action to use other resources on campus.

Heather developed action plans with her coach to manage academics and create healthier life habits:

So I guess we've talked about stuff like organization in terms of, not in terms of school but in terms of things that I need to do to take care of myself. Like incorporating exercise or taking my medicine at the right time every day or eating healthy food and getting enough sleep. Just the overall things that we need to do as students to be healthy and especially students with ADD.

Michelle described how coaching improved her approach to writing papers:

Another [goal] that has been really hard for me is breaking down my assignments. So we've been talking about papers that I know are due at the end of the semester. And each week I've had to do something towards doing that paper. I haven't always been as successful as I want to be, but it has allowed me to think differently about how I approach projects. Because, typically, I just wait until a week before; two, three days before and it's stressful and chaotic. So at least with this I've been learning how to manage pieces of the project.

Coaching has also helped Michelle plan with greater awareness of time:

...in the past I would just say, "Okay, today I'm going to study," but [my coach] forces me to say, "Okay, what are you going to do? How much time are you going to spend on that? Write in [your

planner]. When are you...?" So it really makes me realize how valuable the time is in a day. And it helps me be focused.

Finally, Adam credited coaching with helping him utilize accommodations as well as additional university resources:

Also, through coaching, I got the accommodations the first couple of semesters. So I got note-takers for the first time and [my coach] introduced me to Dr. \_\_\_\_\_, who I'm seeing at Counseling and Wellness office for medications. The kind of bottleneck that I explained earlier, about how coaching was the gateway that opened up to other things that also spiraled into positive changes. I guess coaching was really what led me [to] the threshold for me to have access to all of these different resources.

The third broad theme regarding the benefits of coaching was a positive impact on students' subjective well-being. Students enjoyed how coaching helped them manage negative emotions and stay motivated and confident about reaching their goals. Tim described how coaching provided him with tools to regulate stress:

I'm generally a pretty happy person but I get stressed out very easily because I put stuff off, procrastinate. So it all builds up. I think it [coaching] has made me less prone to panic about something. Hopefully, I think it's [that] I'm more willing to - rather than just give up on something - to take a deep breath and calm myself down and look at how I am going to approach it.

Prior to coaching, Adam struggled to sustain his effort and motivation throughout an entire semester. This impaired ability led to poor grades and, ultimately, academic ineligibility. Adam explained how coaching helped him keep his emotional state steady, enabling him to maintain effort and improve his grades to A's and B's:

Back in the day, I guess one of my biggest stumbling blocks was the feeling that all this didn't matter or nobody really cared. So it was part of a downward spiral to just lack of performance and just apathy. But having someone to let me self-correct at least once a week definitely helped me [change] from just uncontrollably heading downward. And I guess

coaching, the fact that it helped me improve so much on the core areas of my life in general, helped me become a more happy and stable person. And when you feel strong overall, I think it just helps you overcome bad moods and bad emotions better and quicker because you have a bigger framework in which you can process them.

In addition to asking students what they found most helpful about coaching, the researcher also asked them to describe any limitations of the coaching model or how this service was provided to them. Many of their comments focused on logistical restrictions, such as building location and length of sessions. Two students wanted even greater accountability than coaching provided. Students also suggested that including a broader range of topics in coaching sessions, such as planning for life after graduation, would have been helpful. Josh detailed the limits of 30-minute appointments:

One of the challenges, I think, is just kind of the half hour period. So generally we start each session with, "How have you been?" And that can take anywhere from three minutes to 15 minutes. And by the time we actually dive into some of those, "Well, let's look at your behaviors from the past week. What created those outcomes, whether that's positive or negative? How can you continue those positive outcomes?" And this happens almost every 20 minutes in so it's really hard to think about the present moment, what's coming ahead, so I feel I'm just really limited by the half hour. An hour might be a little more effective.

Tim was one of several students who benefited from the accountability built into coaching, but wanted even more:

As much as we have worked on accountability, I have improved, but I certainly have shirked plenty of responsibility and things. So, I don't know if this is a broader coaching thing. But, my setting up more of an aggressive accountability plan. More of a recording, "Did you do this? No, I didn't do this."

Finally, Adam wondered how his disabilities would impact him after graduation in a different setting. In recognizing what he had gained from coaching, the high level of self-awareness was easy to observe. He

anticipated new challenges ahead and wished that coaching could help him prepare for this impending life transition.

I don't know, some sort of support for life after college. Because success here [in college] is important but, also, the problems that cause the people like us to have trouble here may also cause us to have problems outside of school but in a different way. And just because we've overcome them in the school context doesn't mean that a different set of problems aren't going to arise due to our disabilities. So, kind of having the future in mind and being able to talk about that, I think, would help.

### Case Study

The following case study illustrates more fully the overall impact of coaching on one student who participated in this study. Megan, an undergraduate with ADHD, benefited from consistent coaching in numerous ways, including developing skills to be academically successful in college and in creating and achieving post-graduation plans. Due to her commitment to coaching, Megan made actual changes to her behaviors and her thought processes which improved her college experience and enhanced her life.

*Megan was a nervous 19 year old sophomore who was in serious academic trouble when she scheduled her first coaching session (prior to the start of the coaching study). Because she had been experiencing extreme emotional distress during her first semesters in college, her parents were her constant crutch and she reported requiring an excessive amount of parental support. After 3 semesters, her GPA was .23 and she became academically ineligible which forced her to leave school for the following semester. This experience of failure quickly led to an evaluation for and diagnosis of ADHD: Predominately Inattentive Type along with an Adjustment Disorder with Mixed Anxiety and Depression.*

*During the following summer, Megan re-enrolled at the university and passed classes while simultaneously meeting with her coach who helped her with time management and study skills. Her academic eligibility was restored which allowed her to return for the fall of her junior year and enroll in the coaching study. That fall, her personal coaching goals included academic success (staying current with her assignments, and study more effectively), health improvements (nutri-*

tion, exercise, and hygiene), balance between social activities and academics, and reducing her level of dependence on her parents.

At one point, Megan noticed her reclusive habits forming – a signal that she might start repeating negative patterns that caused her difficulty in the past, and through discussions with her coach, she joined a jazz dance group which increased both her social contact and physical activities. She used coaching sessions to learn to map out daily plans to specify work periods for assignments. She learned to use a weekly to-do list and calendars with target dates for long term assignments. She elected to have daily email accountability with her coach to ensure she followed her plans. Her GPA for the fall semester was a 2.9, a dramatic improvement, and she was pleased with her progress. Most of all, she saw herself becoming more self-reliant, she required less contact with her parents, and she learned to use resources available to her.

Happily, Megan began spring semester of her junior year with a network of friends, activities she enjoyed, and confidence in her ability to succeed academically. She began planning out both short- and long-term assignments independently, as well as that of her own daily schedule. The focus of weekly coaching sessions were to help Megan develop more efficient study strategies, and to obtain therapy for issues around perfectionism and overreactions to problems and setbacks. Eventually, she petitioned to academic advising to retroactively remove from her transcript the failing grades from the previous year. Megan's account of her earlier struggles and the subsequent progress she made convinced the dean to approve her request. This encouraged Megan to work even harder academically and by the end of the semester she received one B+ and four As, earning her a 3.8 GPA.

After the completion of the coaching study, Megan continued intermittent coaching during her senior year as she faced more challenging classes and approached graduation. She ultimately graduated with a cumulative 3.2 GPA and was hired by a multi-national corporation in the Pacific Northwest, thousands of miles from home, a dream job she had held since childhood. She contacted a psychiatrist in advance of moving to make sure she had access to medication, and got the names of coaches and therapists in case she wanted support during the transition.

This once dependent young woman moved after graduation, excited to face an adventure that neither

she nor her parents thought she would ever have the confidence or skills to handle. Megan acknowledged that the crisis which led to her diagnosis ultimately put her on the road to success. She credits coaching as the pivotal factor that developed her self-awareness and self-management, increased self-confidence and improved goal setting and planning skills necessary to deliberately live her life.

## Discussion

This work supports the claim that coaching holds promise as a service that helps students with ADHD/LD develop better executive functioning and self-determination skills needed for success in college and in life. Working with coaches helped students to think more critically and flexibly to deal with problems, and helped them engage in sustained behaviors that moved them closer to their goals. Coaching also helped students better manage their emotions, daily stress, and distractions, factors that might otherwise derail their motivation and persistence.

Although this is a small study, it is unique in the growing body of coaching literature due to its inclusion of graduate students and an overall participant pool with relatively diverse racial/ethnic backgrounds and diverse diagnoses. Similar studies have either focused exclusively on undergraduates diagnosed with ADHD/LD or failed to report the participants' racial/ethnic characteristics, or comorbid conditions.

According to the three surveys given, students who voluntarily requested coaching possessed more academic risk factors than did the comparison group. This implies, perhaps, that students must reach a point when their difficulties reach a certain threshold which becomes the catalyst for determining that help is necessary. The push must indeed be a forceful one considering that this group, a group that typically displays patterns of inability to maintain commitments, chose to commit to an entire year of being held accountable to a coach. The treatment group consisted of diverse students with complicated needs and, in many cases, a history of needing other types of supports. Yet, they persisted with coaching and ultimately created more structured and manageable lives, increased their self-awareness and -acceptance, and often enhanced their communication abilities and self-advocacy skills.

In summary, college students with ADHD/LD can greatly benefit from coaching services, a vastly

different intervention than the didactic models offered on most college campuses. While students can and do benefit from tutoring, or from assistance aimed at refining their learning strategies, these interventions are not designed to foster growth in executive functioning and self-determination skills. This study showed how coaching helped students take control of their lives by clarifying and setting their own goals, developing realistic plans, and evaluating their progress toward goal attainment. This growth occurred as coaches helped students increase their capacity to self-manage academic, social, and emotional aspects of their lives. Based on this and other studies, it is recommended that service providers in colleges offer individual or group coaching as an adjunct to their already existing services or refer students to outside coaches. By providing coaching to students with ADHD/LD, postsecondary institutions may be able to increase the retention and graduation rates of a growing segment of students.

### Limitations

Findings from this small study of university-based coaching services must be viewed within the context of several limitations. First, despite ongoing recruitment efforts, participation rates were limited and produced relatively small sample sizes. The small sample sizes limited the possibility of seeing significant findings in the quantitative data. Second, the study's most informative findings emerge from the qualitative interviews and while these interviews produced thick descriptions of student experiences with coaching services, such findings cannot be generalized to other settings. Additionally, the qualitative data is also limited due to a lack of any collateral observations from significant others in the students' lives. Finally, ethical considerations precluded the researchers' ability to deny coaching services to students who requested them. Consequently, the use of a self-selected participant pool further limited what could be concluded from the comparison of participants who were and were not coached. It is recommended that future research use randomized control groups, larger sample sizes, longitudinal data, and instruments that accurately measure executive functioning, self-determination, and academic success for college students.

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## Authors' Note

We send sincere thanks to Dr. David R. Parker, Dr. Eric A. Youngstrom, and Ms. Lauren Von Canon, without whose help and support we could not have completed this important research.

# Assessing Metacognition as a Learning Outcome in a Postsecondary Strategic Learning Course

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## Abstract

While metacognition is an important component of the learning process for college students, development of metacognitive knowledge and regulation is particularly important for students with LD and/or ADHD. The researchers used Schraw and Dennison's (1994) *Metacognitive Awareness Inventory* (MAI) to assess first year college students' baseline and follow-up levels of metacognitive awareness during a strategic learning course for students with LD and/or ADHD. Over their first year in college, the students showed significant improvements in a number of metacognitive subprocesses. Several subprocess scores were also found to be positively correlated with GPA. This study's findings can be helpful to practitioners in the postsecondary LD support field. This approach may also be an appropriate way to evaluate the effectiveness of LD support programs when used as part of a broader programmatic review.

*Keywords: Metacognition, learning outcomes, learning disability, postsecondary*

Students with learning disabilities (LD) and/or Attention Deficit Hyperactivity Disorder (ADHD) have particular learning needs that may place them at risk for academic failure. Indeed, in comparison to peers without LD, they have lower rates of persistence to graduation. According to Radford, Lutz, Wheelless, and Shepherd (2010), data collected from the National Center for Education Statistics (NCES) showed that 50% of 2003-2004 entering students without disabilities completed a bachelor's degree within six years. In contrast, only 28% of students with LD did so. Based on the same NCES data, Hunt-White (2011) notes that only 24% of students with ADHD in that cohort graduated with a bachelor's degree within six years.

Among factors that may account for lower graduation rates for students with LD are oral and written language deficits, executive functioning problems, difficulty in disclosing an LD, and asking for appropriate support (Dadeppo, 2009; Smith, English, & Vasek, 2002). Dadeppo (2009) asserts that students with LD

must have adequate self-awareness in order to recognize and articulate their need for accommodations or other support services to appropriate personnel. Students with ADHD also face challenges to college success. Blase et al., (2009) found that students with current diagnoses of ADHD reported more academic, social, and emotional concerns than their peers without ADHD. Norwalk, Norvilitis, and MacLean (2009) found that higher levels of inattentive symptoms in students with ADHD were predictive of poorer study skills and lower levels of academic adjustment and achievement.

Allsopp, Minskoff, and Bolt (2005) emphasize the importance of self-examination and self-awareness for college students with LD and/or ADHD. Similarly, Skinner and Lindstrom (2003) note that understanding their strengths and weaknesses, articulating their disabilities, advocating for themselves, acquiring effective compensatory strategies and learning skills, and developing goal setting and organizational abilities can enhance the likelihood of success for students with

LD. Explicit training in self-advocacy is particularly important in the first year of college as students make the transition from reliance on parental intervention to the need for personal responsibility and self-disclosure (Smith et al., 2002). As students with LD and ADHD enter postsecondary settings in increasing numbers (National Center for Educational Statistics [NCES], 2000), many service providers are looking for ways to support these students. A metacognitive approach may be an effective way to enhance the likelihood of success for students with LD and ADHD

### Review of the Literature

Flavell (1976) defined metacognition broadly as “one’s knowledge concerning one’s own cognitive processes or anything related to them” (p. 232). He also used the term to encompass cognition about other psychological processes such as emotions and motives and the self-monitoring of one’s activities (Flavell, 1987). Subsequent researchers have built upon and further developed the concept. Metacognitive knowledge and metacognitive control and regulation are widely accepted as the two major components of metacognition (Pintrich, Wolters, & Baxter, 2000) and efforts have been made to identify specific elements within them. Schraw and Dennison (1994) specify three subprocesses within the knowledge component (declarative, procedural, and conditional knowledge) and five subprocesses within the regulation component (planning, information management strategies, monitoring, debugging, and evaluation).

Metacognitive skills and strategies have been found to be important for critical thinking skills (Ku & Ho, 2010), a key component for academic success in postsecondary study. Studies have shown relationships between metacognition and overall academic success for college students (Hall, Smith, & Chia, 2008; Kincannon, Gleber, & Kim, 1999; Md. Yunis & Ali, 2008; Nietfeld, Cao, & Osborne, 2005; Romainville, 1994; Schleifer & Dull, 2009; Schraw, 1994; Thiede, Anderson, & Therriault, 2003; Uwazurike, 2010; Young & Fry, 2008). Metacognition has also been found to be important to the success of specific subgroups of college students that face unique challenges. For example, metacognitive strategies contributed to improved reading comprehension for English-as-a-foreign-language/English-as-a-second language (EFL/ESL) students (Latawiec, 2010) and the achievement of college students who were in academic difficulty

and in danger of being dismissed from the university (Rezvan, Ahmadi, & Avedi, 2006).

Training in metacognition has been found to improve academic performance in college students (Thiede et al., 2003). Kincannon and others (1999) determined that embedding metacognitive instruction within course content can improve student awareness and application of learning strategies and contribute to course mastery. James and Ocpala (2010) found that teaching that incorporated and modeled metacognitive knowledge and strategies resulted in greater involvement and interaction with text. Additionally, Applegate, Quinn, and Applegate (1994) found that reading instruction that involved students in monitoring their reading processes contributed to improved metacognitive awareness. Burchard and Swerdzewski (2009) found significant improvement in metacognitive knowledge and regulation among college students participating in a course that taught learning theories and provided opportunities for applying practical strategies to assignments from other courses. Students with LD who were included in the study made gains similar to those of the students who did not report having any cognitive disabilities.

A number of researchers indicate that metacognition is an underlying factor in and predictor of academic success as defined by grade point average (GPA) in college students with LD (Ruban, 2000; Trainin & Swanson, 2005). In comparing metacognitive strategy use of college students with and without LD, Trainin and Swanson (2005) recognize benefits to high strategy use in both populations, but they indicate that the use of learning strategies is particularly beneficial for students with LD. They also found that students with LD and low strategy use achieved lower GPAs than any other group of students in their study. The researchers concluded that strategy use is essential to college success for students with LD. Similarly, Reis, McGuire, and Neu (2000) found that gifted college students with LD benefitted academically by creating personal plans that were based on a metacognitive understanding of themselves as learners, including a range of compensatory strategies that allowed them to meet course demands. Allsopp et al. (2005) also affirmed the benefits of engaging college students with LD and/or ADHD in metacognitive analysis of their learning and of individualizing strategy instruction to take into account students’ unique learning characteristics.

Given its importance to postsecondary success, it is clear that metacognition should be taught explicitly to college students. Uwazurike (2010) recommends using teaching methods that encourage students to apply metacognitive strategies in their efforts to master content. Bembenutty (2009) asserts that students need to accurately assess their knowledge or skill in particular areas, acquire a repertoire of strategies to gain knowledge, and select appropriate strategies for particular academic tasks. He urges educators to support students in becoming self-regulated learners by helping them develop metacognitive skills such as planning, goal setting, and allocating personal and environmental resources. Field, Sarver, and Shaw (2003) state that to be effective, programs for college students with LD must help them acquire critical components of self-determination. Many of these components, such as self-knowledge, reflective thinking, planning and organizing, utilizing effective strategies, and evaluating outcomes, involve metacognition.

## Method

### Purpose of the Study

The current study was conducted as one part of a broader review of a college support program for students with LD and/or ADHD and was focused on assessing metacognitive growth as one of the intended outcomes of participation in a two-semester sequence of strategic learning courses offered within the program. The authors examined initial and follow-up levels of metacognitive knowledge and regulation in students enrolled in first year credit-bearing (1.5 credits per semester) strategic learning courses. The courses were offered by a fee-based comprehensive learning support program for students with LD and/or ADHD at a small, private, four-year liberal arts-based college in the Northeast. Through one-to-one and small group instruction, the courses guide students in applying metacognitive processing and targeted learning strategies to the other academic courses in which they are enrolled outside the program.

Course objectives related to metacognition include development of students' abilities to define and explain their preferred learning styles, strengths, and challenges; to identify and apply learning strategies that match their learning profiles; to select strategies appropriate to the task; to monitor and evaluate their strategy use; and to plan and direct their learning be-

haviors to effectively meet task demands. Curriculum includes strategic instruction in time management, planning, organization, study skills, reading, research and essay writing, test-taking, and use of assistive technology. Metacognitive coaching is embedded in all course activities. The researchers explored the following research questions:

1. Did students in the program make gains in metacognitive knowledge and metacognitive regulation during their first year of college?
2. Were higher levels of metacognitive knowledge and regulation related to academic success for these students, as demonstrated by GPA?

### Study Participants and Data Collection

Forty-eight of the 180 undergraduate first year students enrolled in the two-semester sequence of learning strategy courses participated in baseline and follow-up assessments of their metacognitive knowledge and regulation. Baseline levels of metacognitive awareness and regulation were measured early in the participants' first semester. The follow-up assessment was conducted at the end of the participants' second semester. There were 28 male (58.3%) and 20 female (41.7%) participants, ranging in age from 18 to 22. Full psychoeducational evaluations, including cognitive and achievement test results, were submitted as part of the admission requirements for the program. All participants had documented LD (23) or ADHD (15) or both (10) and a wide range of Wechsler Adult Intelligence Scale-IV (WAIS-IV) subtest scores, characteristic of students diagnosed with LD and/or ADHD. Participants' cognitive profiles showed typical discrepancies between indices. The mean WAIS-IV Index Standard Scores were Verbal Comprehension, 100.4; Perceptual Reasoning, 95.4; Working Memory, 88.4; and Processing Speed, 92.4.

### Measurement Instrument

Metacognition has been studied in a variety of ways. Qualitative studies often use structured interviews that allow researchers to gather interpretive data and explore students' perceptions of their metacognitive abilities and behaviors. Verbal reporting of thought processes during a cognitive task (e.g., think aloud strategy) is also used for qualitative data collection and can provide a window into students' metacognitive processes in real time as opposed to asking them to re-

call past use of metacognitive skills and strategies (Ku & Ho, 2010). A qualitative study employing interviews or a think aloud strategy, however, is better suited for an in-depth examination of a small number of participants (Pintrich et al., 2000). For the present study, the researchers wanted to assess the metacognitive awareness of a larger number of students enrolled in the two semester learning strategies course sequence.

Pintrich et al. (2000) assert that there is no single, perfect tool for measuring metacognition, so researchers and practitioners must choose the instrument that best meets their goals, needs, and context. Since the researchers wanted to assess a variety of specific metacognitive skills taught in a specific learning strategies course, study a substantial number of students, and obtain quantitative data that could be compared with students' grade point averages, they decided to utilize an easily accessible survey that students could complete independently, anonymously, and relatively quickly. Several self-report instruments were considered. *The Executive Process Questionnaire* (Hall, 2005) assesses metacognitive behaviors as well as other aspects of executive functioning such as locus of control. *The Behavior Rating Inventory of Executive Function* ([BRIEF]; Roth, Isquith, & Gioia, 2005) also measures aspects of metacognition within the broader area of executive functioning. *The Motivated Strategies for Learning Questionnaire* (Pintrich, Smith, Garcia, & McKeachie, 1993) includes three motivation scales and nine learning strategies scales that assess cognitive as well as metacognitive strategies. These instruments examined a broad range of characteristics and did not assess metacognitive knowledge and skills with the level of specificity the current study was seeking. In comparison, Schraw and Dennison's (1994) *Metacognitive Awareness Inventory* (MAI) provided a more useful tool to assess baseline and follow-up levels of specific aspects of metacognition that were taught in the learning strategies course. These aspects include the development of metacognitive knowledge; planning and organizing; and the selection, implementation, monitoring, and evaluation of learning strategies.

Schraw & Dennison (1994) performed a factor analysis of the 52-item MAI, which they administered to 197 undergraduate students. Their two-factor solution revealed that factor I was composed of MAI items that relate to Knowledge of Cognition and factor II included items that relate to Regulation of Cognition. The authors measured the average of the inter-item cor-

relations for items included on each factor, to estimate reliability and reported an alpha coefficient of .91 for both factors. The alpha coefficient for all items in the MAI was .95. These high measures of internal consistency are indicators of high reliability for the MAI.

Schraw and Dennison (1994) also assessed the validity of their instrument. They proposed that the MAI would correlate with other empirical indicators of metacognitive awareness, intellectual performance, and metacognitive regulation. Their participants provided estimates of their ability to self-monitor their performance, which is a component of metacognitive awareness. Additionally, they completed four sub-tests from the Nelson-Denny Reading Comprehension test as a measure of intellectual performance. Finally, the participants provided estimates of their confidence in their reading comprehension ability as a measure of metacognitive regulation.

The investigators obtained significant correlations between the Knowledge of Cognition scores from the MAI and the participants' judgments of self-monitoring ability ( $r = .31, p < .01$ ), as well as Knowledge of Cognition and reading comprehension performance scores ( $r = .26, p < .01$ ). The Regulation of Cognition scores correlated ( $r = .21, p < .05$ ) with the participants' confidence ratings for their reading comprehension performance. These findings support the validity of the MAI as a measure of metacognitive awareness.

Pintrich et al. (2000) note that the MAI has external validity since there is a positive correlation between scores on the MAI and students' achievement scores. They also state that it satisfies relevance and utility concerns for use with groups since students have usually had experience with similar response formats and it is easy to administer. Schraw and Dennison (1994) concluded that "the MAI provides a reliable initial test of metacognitive awareness among older students" (p. 472). They also suggest that "using the MAI may be a useful strategy for planning subsequent metacognitive training" (p.472). Additionally, the MAI has been used in previous research on college students with and without LD (Burchard & Swerdzewski, 2009; Kincannon et al., 1999; Young & Fry, 2008). The researchers concluded that the MAI was the most appropriate tool for this study because it allowed them to assess their students' performance in specific areas that are consistent with course objectives, determine those most correlated with academic achievement, and guide future instruction.

The MAI is a 52-item self-report inventory that measures two major components of metacognition: *Knowledge of Cognition and Regulation of Cognition*. The *Knowledge of Cognition* component includes three subprocesses: Declarative Knowledge (self and learning strategy knowledge), Procedural Knowledge (how to use learning strategies), and Conditional Knowledge (when and why to use learning strategies). The *Regulation of Cognition* component includes five subprocesses: Planning (setting learning goals), Information Management Strategies (implementing strategies), Monitoring (paying attention to strategy effectiveness), Debugging (being aware of and correcting errors), and Evaluation (reviewing use of and effectiveness of strategy) (Schraw & Dennison 1994).

### Procedure

Baseline data were collected from students enrolled in their first semester in the program. The MAI was transferred to an on-line protocol using Survey Monkey. A link to complete the MAI was sent by email early in the fall to all 180 first-year students who were enrolled in various sections of the learning strategies course. Participants were directed to respond to statements on the MAI by choosing a number on a 10-point Likert-type scale (1 being most false and 10 being most true) that indicated how well a given statement corresponded to their metacognitive knowledge and regulatory behaviors. See Table 2 for sample items. Higher scores indicate higher levels of self-reported metacognitive knowledge and/or metacognitive regulation.

Eighty students responded (44% response rate). In late spring, a new *Survey Monkey* link to the follow-up assessment was emailed to the original 80 participants. Forty-eight (60% response rate) of the original 80 participants responded. The responses from those who completed both the baseline and follow-up were collected via the *Survey Monkey* website and downloaded into spread sheets for subsequent analysis.

### Results

The researchers first compared the 48 individual respondents' baseline and follow-up scores on the two major components of the MAI: *Knowledge of Cognition and Regulation of Cognition*. The mean score comparisons are summarized in Table 1.

Changes in the mean scores on the two main components were analyzed using one-tailed, matched pairs,

*t*-tests. The baseline mean score for the *Knowledge of Cognition* component was 7.1936 and this value increased to 7.5370 in the spring follow-up. The difference was statistically significant ( $t = 1.782, 47 \text{ d.f.}, p = .04$ ). The mean score on the *Regulation of Cognition* component increased from 6.6815 in the baseline administration to 7.0619 in the follow-up assessment. This difference was also statistically significant ( $t = 1.893, 47 \text{ d.f.}, p = .033$ ).

A comparison of the mean scores (Table 1) reveals a relatively small difference between the *Knowledge of Cognition* and *Regulation of Cognition* components in both baseline (.51 difference) and follow-up (.47 difference). This is not surprising since a relationship between the two components is assumed in many of the widely accepted theories of metacognition (Brown, 1987; Flavell, 1987). Neither is it unexpected that in both baseline and follow-up, mean scores for *Knowledge of Cognition* are slightly higher than for *Regulation of Cognition*. There is often a gap between knowing about a concept, skill, or process and actually applying that knowledge in practice. Students in this two semester sequence of courses were first-year college students who were in the process of acquiring and applying many of the regulatory skills assessed by the MAI.

In addition to analysis of statistically significant changes in the two major components, a series of one-tailed, matched-pairs, *t*-tests (47 d.f.) were conducted to determine which sub-process scores within the *Knowledge of Cognition* and *Regulation of Cognition* components showed statistically significant changes from baseline to follow-up administrations. All subprocess scores under both components improved. Within the *Knowledge of Cognition* component, only the change in Declarative Knowledge (DK) score, from 7.1016 to 7.5026 ( $t = 1.959, p = .028$ ), was statistically significant. However, within the *Regulation of Cognition* component, there were a number of statistically significant increases in sub-process scores. Information Management Strategies (IMS) increased from 6.9313 to 7.2771 ( $t = 1.676, p = .05$ ); Comprehension Monitoring (M) improved from 6.381 to 6.9167 ( $t = 2.036, p = .024$ ) and Planning (P) increased from 6.5238 to 6.9137 ( $t = 1.80, p = .039$ ). The subprocess of Evaluation (E) score increased from 6.184 to 6.6771 ( $t = 2.058, 47, p = .023$ ).

Analysis of mean scores for subprocesses within each component provides a closer look at patterns within the global results. Analysis at this level enabled

Table 1

*Fall Baseline and Spring Follow-up Comparisons of Component and Subprocess Means*

	Baseline	Follow-up
Component Means		
Knowledge of Cognition	7.19	7.53
Regulation of Cognition	6.68	7.06
Subprocess of Knowledge of Cognition		
Declarative Knowledge (DK)	7.10	7.50
Procedural Knowledge (PK)	7.07	7.41
Conditional Knowledge (CK)	7.41	7.70
Subprocesses of Regulation of Cognition		
Planning (P)	6.52	6.91
Information Management Strategies (IMS)	6.93	7.28
Comprehension Monitoring (M)	6.38	6.91
Debugging Strategies (DS)	7.39	7.53
Evaluating (E)	6.18	6.68

Table 2

*MAI Items with the Greatest Improvement Mean Scores*

	Statement	Process
17	I am good at remembering information	Declarative Knowledge
34	I find myself pausing regularly to check comprehension	Monitoring Comprehension
42	I read instructions carefully before I begin a task	Planning
43	I ask myself if what I am reading is related to what I already know	Information Management
44	I re-evaluate my assumptions when I get confused	Debugging Strategies
49	I ask myself questions about how well I am doing while I am learning something	Monitoring Comprehension
50	I ask myself if I learned as much as I could have once I finished a task	Evaluating

the researchers to see changes in students' subprocess scores that occurred over time after direct instruction and through more general experiential opportunities students had as they participated in their first year of college. The students in this study showed significant improvements in the following subprocesses: Declarative Knowledge (DK), Evaluation (E), Information Management Strategies (IMS), Monitoring (M) and Planning (P). It is important to note that the greatest gains were made in subprocesses of the *Regulation of Cognition* (Evaluation, Information Management Strategies, Monitoring and Planning). Though not at the level of statistical significance, gains were shown in all of the other subprocess scores as well.

Analysis of individual items reveals that 50 out of 52 item means increased from baseline to follow-up administrations. Of the seven items showing the greatest gains, all but one (item 17) were within the *Regulation of Cognition* component. Although the *Regulation of Cognition* component score continues to be slightly lower than the *Knowledge of Cognition* component score, the gap between the two is smaller than it was at the beginning of the study. Specifically, students reported the greatest improvement in the items shown in Table 2.

For the spring follow-up administration, item analysis reveals five items in which the mean score is over 8.0. Four of the items are in the *Knowledge of Cognition* component, which continues to be the stronger area. The four items within the *Knowledge of Cognition* component include the following: *I try to use strategies that have worked in the past; I understand my intellectual strengths and weaknesses; I learn best when I know something about the topic; and I learn more when I am interested in the topic.* The one item in the *Regulation of Cognition* component with a mean score over 8.0 is a debugging strategy: *I stop and re-read when I get confused.* In strong contrast to the fall baseline assessment, where there are three item mean scores below 5.75, there were no scores below that threshold in the spring follow-up. The lowest follow-up score of 6.1 is on item 24 (*I summarize what I have learned after I finish*).

The researchers also examined changes in fall baseline and spring follow-up GPAs. The mean GPA for the fall semester was 2.6524 and this value increased to a mean of 2.7904 for the spring semester. The difference was not statistically significant ( $p = .115$ , one-tailed), but the increase of .138 average grade

points was educationally meaningful. The researchers also sought to determine whether higher levels of metacognitive knowledge and regulation correlated with GPA. The correlations between the *Regulation of Cognition* component score and fall GPA ( $r = .154$ ) and *Knowledge of Cognition* and fall GPA ( $r = .237$ ) were not statistically significant. However, for the spring semester, *Knowledge of Cognition* and GPA were more highly correlated ( $r = .439$ ,  $p = .003$ ) and the correlation of *Regulation of Cognition* and GPA was statistically significant ( $r = .371$ ,  $p = .012$ ). These relationships are consistent with the gains noted in *Knowledge of Cognition* and *Regulation of Cognition* component scores from baseline to follow-up noted above. Specifically, the researchers found a relationship between metacognitive skills and GPA during the spring semester; of particular note is the statistically significant correlation between spring GPA and the scores that measure regulatory behavior.

In addition to the correlations between the MAI component scores (*Knowledge of Cognition* and *Regulation of Cognition*) noted above, correlations between the subprocess scores and GPA for the fall and spring semesters were also examined. Because the subprocess scores are all highly inter-correlated (baseline subprocess score inter-correlations all exceeded  $r = .625$  and follow-up sub-process score inter-correlations all exceeded  $r = .702$ ), the researchers used stepwise multiple regression to evaluate each subprocess score's individual contribution to predicting GPA values, independent of the role of other subprocess scores. For the fall semester, Procedural Knowledge (PK) showed a correlation of  $r = .276$ , with GPA ( $p = .03$ ). This finding indicates that variation in PK values accounts for 7.6% of the variation in fall semester GPAs. For the spring semester, the correlation between PK and GPA was  $r = .486$  ( $p = .001$ ). Thus, variation in spring semester PK scores accounts for 23.6% of the variation in spring GPA. Numerous other subprocess scores were also positively correlated with fall and spring GPA, but their correlation with PK scores made their additional contribution to predicting GPA redundant. The high inter-correlation among all of the subprocess scores suggests that they are all measuring very similar processes of executive function. Controlling for the relationship between PK scores and GPA, further analysis of all the other subprocess scores show insignificant correlations with GPA in both baseline and follow-up.

The increase in mean GPA across the two semesters prompted the researchers to examine changes in the subprocess scores that might correlate with the increase in students' academic performance as measured by GPA. A multiple regression analysis, using the difference between spring and fall GPA scores as the predicted variable, was performed. Results showed that increases in the Planning (P) subprocess score of the *Regulation of Cognition* component were correlated with increases in GPA ( $r = .385, p = .009$ ). This finding indicates that increases in Planning account for 14.8% of the variance in the fall to spring GPA score increase. Thus, improvements in planning functions are associated with increases in the students' GPA.

### Discussion

The results of this study provide support for including metacognitive knowledge and regulation as targeted outcomes in strategic learning courses aimed at enhancing college success for students with LD and/or ADHD. They also demonstrate a useful and efficient way to assess students' progress in achieving these outcomes. These findings are important to programs and interventions that support first-year college students with LD and/or ADHD as well as college support programs for other populations.

For the first year students with LD and/or ADHD in this study, self-reported levels of metacognitive awareness improved from their first to second semesters in college. Their spring follow-up MAI scores in regulatory behavior were significantly correlated with their GPAs. It is clear that metacognitive awareness can be enhanced and that it is related to college achievement. The fact that these students made gains in metacognitive regulation and that regulation was positively correlated with GPA suggests that college programs for students with LD and/or ADHD should incorporate instruction in metacognition and provide opportunities for students to apply regulatory skills to course work. While a variety of experiences likely contributed to the growth of metacognitive knowledge and regulation in the students in this study, it is also likely that participation in a learning strategies course emphasizing metacognitive growth also contributed to their gains in this area.

The researchers found that the MAI was a useful tool to evaluate students' levels of metacognitive knowledge and regulation. Having information regard-

ing students' general levels of metacognitive knowledge and regulation and their performance on specific subprocesses within these components can allow practitioners to target and evaluate students' growth in these areas. For college LD and/or ADHD support programs, MAI results can be used in conjunction with students' psychoeducational assessments when planning educational interventions. When used to collect pre- and post-intervention data about students enrolled in a learning strategies course, the MAI can measure individual student's growth in metacognitive awareness and contribute to the assessment of the course or program's efficacy. This can make it a valuable part of a multi-faceted, comprehensive program evaluation. In fact, the study reported here was one component of a broader outcomes assessment that included, among other measures, qualitative interviews with students and written student evaluations of the program.

While this study was conducted only with students with LD and/or ADHD, it is likely that interventions that foster metacognitive growth will also contribute to the academic success of other student populations. Many new college students struggle because their past experience and prior knowledge do not sufficiently prepare them to handle the demands of college. Their beliefs and attitudes about learning and themselves as learners, their repertoire of strategies, and their ability to select and apply appropriate strategies may not be conducive to college success. By engaging in metacognitive reflection, they can begin to question, revise, and assess the way they approach academic tasks and acquire more effective approaches necessary for success in postsecondary settings. Self-appraisal and self-management are critical for college success. By assessing their own abilities, gaining a better understanding of what is required by various learning tasks, evaluating the efficacy of their strategies, and acquiring more effective learning skills, students who may have become discouraged and given up can discover ways to help themselves succeed (Taylor, 1999). Metacognitive monitoring and regulation of learning behaviors has the potential to contribute to academic success for postsecondary students who are at risk for a variety of reasons including learning disabilities, emotional challenges, or inadequate preparation.

This study examined relationships between metacognition and academic success in college students, but has implications for other contexts as well. In studying adults with dyslexia, researchers have found

that participants improved their feelings of self-efficacy when they understood their skills and abilities, were able to set goals, and could plan the steps needed to accomplish them. These regulatory behaviors were key contributory factors in participants' reports of increased self-efficacy and were related to success and employment satisfaction in the workplace (Gerber, 2002; Gerber, Ginsberg, & Reiff, 1992; Leather, Henriette, Seiss, & Everatt, 2011; Madaus, Ruban, & McGuire, 2003).

### Limitations

The current study was conducted as one part of a broader review of a college support program for students with LD and/or ADHD. The researchers focused on assessing metacognitive growth as one of the intended outcomes of participation in a two-semester sequence of strategic learning courses offered within the program; therefore, the study did not employ a control group. Future research is needed to compare data from students with LD and/or ADHD, not enrolled in learning strategies courses, with those who are. This would allow researchers to better assess the impact of the courses in raising metacognitive awareness of first year college students.

Generalizability of results of this study is limited by the fact that all participants in this relatively small study were enrolled at one private, liberal arts college. Future studies of college students in other settings would be helpful.

It is also important to note that self-report instruments are limited by their dependence on the credibility of the respondents (Paulus & Vazire, 2007). It is recognized that results of self-report inventories such as the MAI should not be used in isolation as a diagnostic tool, but can be a valid and positive addition to the assessment process (Paulus & Vazire, 2007; Roth et al., 2005).

The researchers do not claim that the measured growth in metacognition that occurred in participants was solely the result of participation in the courses. They recognize that there are other developmental and environmental variables that likely contributed to the gains in students' metacognition. For example, instruction in some metacognitive strategies may be incorporated in other courses. Maturation and developmental changes that typically occur as part of emerging adulthood may also contribute to growth in metacognition. Therefore, the researchers do not assert a causal

relationship between participation in the courses and the gains in metacognition evidenced by the subjects' MAI scores. They do, however, believe that it is likely that the focus on metacognitive knowledge and regulation in these courses contributed to the students' growth in this area. The researchers also acknowledge that since participants were self-selected volunteers, they are not necessarily representative of all of the students in the LD/ADHD support program.

### Conclusion

A number of studies suggest that metacognition is an important factor in college students' achievement and is a tool that can help them to become more effective learners. The literature also suggests that metacognitive instruction is particularly helpful for students with LD and/or ADHD. Embedding metacognitive instruction in college coursework can provide significant opportunities for students in postsecondary settings to make gains in developing academic self-efficacy. Comprehensive learning support programs have a unique opportunity to provide instruction in metacognitive knowledge and regulation in order to support students' growth of self-understanding and mastery of academic tasks. Providing a means to assess whether students are making gains in developing metacognition is critical when this construct is a curricular component. One possible tool to examine both baseline and follow-up levels of metacognitive knowledge and regulation is the MAI.

The researchers believe that an in-depth analysis of the results of the MAI provides important information that can guide effective practice in working with college students with LD and/or ADHD. The use of the MAI as a tool for assessment of metacognitive knowledge and regulation can also inform curricular review and revision in comprehensive postsecondary support programs. In the program studied, commitment to metacognitive growth was reinforced through curricular changes that include linked strategy and subject matter courses in mathematics, history, management, and education. Additionally, e-portfolios have been added to some sections of the course as another means to encourage reflective learning behavior.

While it is not possible to directly link the growth in metacognitive knowledge and metacognitive regulation measured by the MAI to participation in the strategic learning courses, it is likely that strategy

instruction can contribute to gains in self-efficacy for college students with LD and/or ADHD. Additionally, this study showed that higher levels of metacognitive knowledge and regulation were positively correlated with GPA. Postsecondary institutions with comprehensive learning support programs would benefit from incorporating metacognitive instruction into their work with students with LD and/or ADHD.

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# Using the College Infrastructure to Support Students on the Autism Spectrum

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## Abstract

College students with high functioning autism (HFA) and Asperger syndrome (AS) are participating in postsecondary education in increasing numbers. Institutions of higher education (IHE) that admit these students should support their individual and unique needs. The challenges these students face in the domains of social interaction and executive function are often not addressed adequately. Traditional accommodations for students with disabilities are often insufficient to impact these students' academic success and broader educational experience. Currently, only a handful of colleges and universities have developed specialized programs to support students on the autism spectrum. Often costly, such programs add thousands of dollars in fees above and beyond escalating tuition costs. Consequently, it is not surprising that most of the specialized autism support programs reside in private rather than public institutions. This article will discuss the notion that postsecondary institutions that do not have autism specialty support programs can utilize the resources that already exist in their infrastructure to support these students. This article describes the contributions of the various resources, facilities, and centers present on many college campuses that can be better utilized to support this endeavor. A key element of this approach is the coordination and collaboration among the different divisions in order to best serve this growing student population.

*Keywords: Autism spectrum disorder, Asperger syndrome, support, infrastructure*

The most recent report of the Centers for Disease Control and Prevention (2012) indicates that the incidence of autism spectrum disorder (ASD) in children has increased to 1 in 88. Greater awareness of the red flags of ASD, coupled with a broadening of the spectrum since 1994 to include milder forms of the condition, contributed to a dramatic rise in the incidence of individuals diagnosed with ASD. However, a concurrent decrease in other diagnoses (Boyle et al., 2011) has led many experts in the field to conclude that, at least to some degree, a shift in how students are diagnosed, rather than a sudden explosion of cases, accounts for the exceptional rise. For example, Shattuck (2006) reported that, as the number of children who were eligible for special education under an autism classification from 1994 to 2003 increased, the number of students who qualified for services under

the categories of intellectual disability and learning disability declined.

Nevertheless, early diagnosis and positive outcomes from early intervention, coupled with educational and therapeutic services throughout the preschool, elementary, and secondary years, has enabled more individuals with high functioning autism (HFA) and Asperger syndrome (AS) to attend college (Graetz & Spampinato, 2008; Jones, 2012; Smith, 2007; Taylor, 2005; Zager, Alpern, McKeon, Maxam, & Mulvey, 2013) and more will continue to do so in the coming years. Anecdotal reports among those working in institutions of higher education (IHE) further support the increase of college students with spectrum conditions. Despite the lack of formal data regarding the number of students on the spectrum currently enrolled or expected to do so in the future, colleges should prepare to serve

this growing population (Davis, 2012). The success or failure of these students once enrolled in college could be determined by the degree to which they can be supported by their IHE (Welkowitz & Baker, 2005).

The purpose of this article is to provide information to those who work in college or university settings about programs for the growing population of students with HFA/AS and to offer suggestions for those IHEs that have not yet established programs to meet the needs of these students by using already existing resources. This article will address the (1) legal mandates related to the college students on the spectrum, (2) differences between service provision in high school and college, (3) specific challenges of college students on the spectrum that might sabotage the success of their college experience, and (4) state of the art of programs for college students with ASD. Next, the article will explore how the existing infrastructure of an IHE can be tapped to better serve these students until a program is developed and in place. This article describes the contributions of the various resources, facilities, and centers present on many college campuses that can be better utilized to support this endeavor. In order to do so, the different components of the infrastructure will need to coordinate and collaborate to best serve these students. The article will conclude with suggestions for future directions.

### **Legal Mandates for College Students with ASD**

Colleges and universities must provide all students with a documented disability with reasonable accommodations for each of their classes unless doing so would constitute a fundamental alteration in the nature of the class or would be an undue burden. Further, college students requiring accommodations must be otherwise qualified to meet the essential requirements of their courses/program of study, with or without reasonable accommodations. In high school, students were served through the Individuals with Disabilities Education Act (IDEA) with an individualized education plan (IEP) to receive a free and appropriate public education (FAPE), which provided curriculum modifications, therapeutic services, and other supports deemed necessary to enable them to succeed. Parents were mandated to be part of the special process while providing needed familial support throughout their child's preschool, elementary, and secondary school years. In addition to parents, educators and therapists put systems into place to maximize their students'

success. Often the students received ongoing support with organization, routine, and negotiating the social world (Welkowitz & Baker, 2005).

However, a different set of legal mandates applies at the college level (Ciccantelli, 2011; Graetz & Spampinato, 2008; Wolf, Thierfeld Brown, & Bork, 2009; Zager et al., 2013). Section 504C of the Rehabilitation Act (1973) guarantees that a student with a disability will have equal access to all educational programs, services, facilities, and activities. The legal requirement is that the student will not be excluded from participation in any aspect of college life. The Americans with Disabilities Act ([ADA], 1990) entitles students with a documented disability to reasonable accommodations set by law (VanBergeijk, Klin, & Volkmar, 2008). Common accommodations at the college level for students with disabilities include extended time on tests and alternative quieter exam locations (Smith, 2007; Wolf et al., 2009). While these more traditional accommodations would be useful to some students on the spectrum, accommodations should reflect the students' individual needs (Pillay & Bhat, 2012). Students with HFA/AS often need support in two additional domains that go beyond the more common, traditional reasonable accommodations, (1) the executive functions of planning, organizing, and time management, and (2) the social-emotional/relationship realm.

### **Differences in Serving High School and College Students with Disabilities**

At the college level, unlike all prior educational experiences, the student is essentially responsible for his or her own needs. By law, students with disabilities cannot access the reasonable accommodations mandated by the Section 504C/ADA unless they self-disclose their disability to a designated entity, usually the disabilities services office at their college, and self-advocate for those accommodations. Self-disclosure and self-advocacy, important issues for college students with ASDs, are discussed in the emerging professional literature (Ciccantelli, 2011; Robertson & Ne'eman, 2008; Wolf et al., 2009) and recommended by individuals with HFA/AS who have succeeded in college and beyond (Carley, 2008; Shore, 2003; Willey, 1999). Secondary schools could help ensure that their students on the spectrum who wish to go to college have the readiness skills to enroll by providing advanced preparation in the social, self-advocacy, and organizational domains during the IDEA

mandated transition-planning phase of high school (Ciccantelli, 2011).

Several key issues should be addressed during this crucial transition phase before the student enrolls in postsecondary education, including the type and size of the college, the student's independent living skills, disclosure and self-advocacy, and the level of academic and social supports that would be needed in order for the student to succeed (Adreon & Durocher, 2007). Fortunately, resources are available for individuals on the spectrum who are considering college, their parents, and the professionals who work with them (Bork, Brown, King, & Wolf, 2012; Freedman, 2010; Harpur, Lawlor, & Fitzgerald, 2004). Such resources could help in the decision making process while the student is still in high school and the family has access to the support of a transition team to help inform future plans.

### **Challenges of College Students with ASD**

ASDs are complex neurodevelopmental disorders whose triad of symptoms include problems in social interaction, difficulty with communication, and restricted and repetitive behaviors, all of which emerge during the developmental period. These core characteristics, manifest in varying degrees depending on the individual's profile, are often identified by the preschool years. In some cases, individuals with AS are diagnosed later because of their average to above average intellectual and semantic-syntactic linguistic abilities. However, students on the spectrum who attend college may continue to have challenges in these core areas despite having received years of educational and therapeutic services. The transition to college is particularly stressful because these individuals often struggle with change in routine and have a strong need for predictability (Glennon, 2001). Advanced preparation for these new circumstances is highly recommended (Ciccantelli, 2011) and should be a cornerstone of the transition process for those high school students who wish to pursue higher education, as many students on the spectrum are overwhelmed by this experience (MacLeod & Green, 2009). Neurodevelopmental disorders rarely appear in isolation, but rather usually co-exist with other associated features. Other challenges of this heterogeneous population include sensory sensitivities to noisy environments or bright lights, difficulty regulating their attention, and psychological problems such as anxiety and depression.

The social challenges of adults on the spectrum are well documented in the extant literature (Sperry & Mesibov, 2005). Because of their challenges in understanding others' points of view, students with HFA/AS may have difficulty interacting with their professors and classmates, an essential function in a college setting, which could lead to academic problems. For example, the student might demonstrate inappropriate, annoying behaviors such as speaking out of turn, asking too many questions, standing too close to classmates, or touching another's course materials (Welkowitz & Baker, 2005). Problems with social interaction can sabotage the student's ability to engage in group projects and impinge on academic outcomes. Carley (2008) comments that a college student's social life and academic outcomes are closely related, noting that if social challenges become unmanageable, they could impede the ability to study. Colleges are not expected to provide the extensive social supports needed by some students with HFA/AS (Welkowitz & Baker, 2005).

In addition to social interaction, another significant challenge for many college students on the spectrum is executive functions, a multidimensional cognitive construct that describes goal-directed, future-oriented behaviors. Executive function skills include planning, flexibility, self-monitoring, working memory, and goal setting (Ozonoff, South, & Provençal, 2005) that allow individuals to manage their day-to-day lives and activities in order to achieve goals. These skills are clearly necessary for college life, with its emphasis on independence and self-determination. Tasks such as pacing course readings, completing long-term assignments, coping with schedules that vary from day to day, and keeping appointments pose significant challenges to this student population (Geller & Greenberg, 2009; Wolf, et al., 2009; Zager et al., 2013). Executive dysfunctions create added challenges for those who go away to college and must manage the essential functions of their health, sleep patterns, laundry, and meals in addition to their academic and social lives (Welkowitz & Baker, 2005).

### **College Programs for Students with HFA/AS**

The need for college programs specifically designed for students with HFA/AS is increasingly important but the number of such university-sponsored programs is relatively small (Hewitt, 2011; Smith, 2007). Several of these programs, some in their pilot stages,

have been described in the emerging literature. For example, Hewitt (2011) describes supports at Bowling Green State University. Welkowitz and Baker (2005) discuss aspects of their residential campus-based support program at Keene State University. Smith (2007) reported on a successful support group for students with AS at Baylor University. Robertson and Ne'eman (2008) list additional programs at Marshall University, Western Kentucky University, Farleigh Dickinson University, the University of Arizona, the University of Alabama, and Oakland University. A compilation of such programs can be found at <http://www.collegeautismspectrum.com/collegeprograms.html>. Some common characteristics among these programs are academic, social, and vocational supports, and sometimes peer mentoring. Most of these programs are relatively new and have not been in existence long enough to determine their effectiveness for retention and postgraduate outcomes (Jones, 2012).

Further, these programs can be costly. Many colleges charge thousands of dollars in extra tuition or fees for the students' participation. Examination of the list of the programs on the Higher Education and Autism Spectrum Disorders, Inc. (2012) website indicates that the cost of these programs ranges from \$2000 to \$8500 per semester depending on the college and services used. Their expense can pose an economic hardship to families already financially burdened by regular escalating tuition costs. Such programs would be prohibitive to students from lower income levels who are more likely to attend a public IHE where tuition costs are relatively lower than in private schools. Consequently, it is not surprising that most of these programs exist in private colleges and universities. Using, adapting, and expanding supports that are already in place in the existing infrastructure of the IHE can minimize the cost of supporting students on the spectrum.

### Using the College Infrastructure

Until more programs for college students on the spectrum are developed, institutions of higher education can adapt their "existing systems" (MacLeod & Green, 2009, p. 632) to respond to the needs of these students. Many colleges have a variety of support services and facilities already in place that could be used to serve this growing student population. In addition to centers for disability services, now present on most campuses, additional supports such as health clinics, personal counseling centers, career counseling centers,

speech-language-hearing clinics, and residential life offices may exist in the infrastructure of many college communities that could support its students with HFA/AS. According to the Merriam-Webster dictionary, *infrastructure* refers to "the basic, underlying framework or features of a system or organization ([www.merriam-webster.com/dictionary](http://www.merriam-webster.com/dictionary)). In the case of a college campus, its infrastructure includes its system or organization, clinical facilities, offices, and centers as well as a variety of academic departments. Wolf et al. (2009) note that various offices across campus involved with student life and academic affairs can forge relationships to support its college students with ASD.

Specific components of the infrastructure that can be found in many, if not all, college communities will be identified next in order to discuss their roles (or potential roles) in supporting the needs of its students on the spectrum.

**Disabilities Services.** All college campuses are legally mandated to provide admitted students with disabilities with reasonable accommodations that allow them equal access to college life, including coursework. Most colleges have a disabilities services office that is responsible for assuring that the students receive their accommodations. Other smaller universities manage ADA compliance obligations as part of other offices, such as the provost's or the dean of students. Typically under the administrative auspices of student affairs (Davis, 2012), the disabilities office of a college could coordinate the services provided by the other components of the college infrastructure to address the needs of students on the spectrum.

At college orientations held prior to or at the beginning of freshman year, students with disabilities should be encouraged to self-disclose their condition since they will otherwise be unable to access accommodations. For their part, disabilities services can set the tone that the college is a welcoming, diverse community for all students, including those who are neurologically atypical. From the beginning of their college experience, students should be informed that self-disclosure is in their best interest and they should be encouraged to submit the necessary documentation.

**Personal Counseling.** Students with HFA/AS may benefit from personal counseling for assistance with stress management and test anxiety (Davis, 2012). In addition, co-morbid depression and social anxiety in students affected by these conditions may be exacerbated by the novelty of the critical first year (Hewitt,

2011; Van Bergeijk et al., 2008). Professionals who have experience with ASDs and training in behaviorally oriented treatments (Pillay & Bhat, 2012) such as cognitive behavior therapy will be well prepared to address the psychological and social-emotional needs of students on the spectrum (Glennon, 2001). In addition to individual therapy, students with ASDs could also benefit from support groups geared toward their concerns (Smith, 2007). Participation in social skill groups that include students with varied diagnoses could also be effective. Psychotherapists and other trained clinicians employed by the college could lead such groups. In addition, pre-service graduate student clinicians could observe, participate, or, lead these groups with appropriate supervision by a licensed professional.

**Speech-Language-Hearing Center.** The speech, language, and communication problems of adolescents and adults with HFA/AS have been well documented (Colle, Baron-Cohen, Wheelright, & van der Lely, 2008; Hewitt, 2011; Seung, 2007; Shriberg et al., 2001; Sperry & Mesibov, 2005). Two of the core characteristics of ASD, namely challenges in social interaction and communication-language, are in the professional scope of practice of speech-language pathologists (American Speech-Language-Hearing Association, 2006). A campus-based speech-language-hearing center can provide the student with HFA/AS with speech-language evaluations, audiological screenings, or complete hearing evaluations as needed. In terms of treatment, clinicians can provide individual or group therapy to address pragmatic language problems of “knowing what to say to whom” or other speech-communication challenges that impact the student’s life and provide social skill enhancement that can be used across a variety of conversational contexts, including the classroom. Speech-language therapy can also address aspects of nonverbal communication and the comprehension of abstract, figurative language, which are often challenging to these students.

**Health Clinic.** Relatively little has been written about the health care needs of college-aged individuals with HFA/AS (Volkmar & Weisner, 2009). College students, especially those attending a residential campus, must learn to be proactive about their health. The college health clinic can serve as a campus-based primary care facility where students can receive evaluation and treatment for acute and chronic medical conditions. Health clinic staff can provide guidance on practices that promote good health and

disease prevention. A quality campus-based health clinic with a knowledgeable staff of nurses and nurse practitioners can serve as a medical home base that improves the well being of its students. The health clinic staff could also refer students to other services such as the speech-language-hearing center for pragmatic language therapy and collaborate with personal counseling to ensure compliance with medication and to monitor side effects.

**Learning Center.** Most colleges and universities have learning centers, which provide a variety of academically oriented services for all students, including those with documented disabilities. Students with HFA/AS are sometimes referred to such centers by the disabilities services office for content-based academic support. Although students in this population may be intellectually gifted or passionate about a particular subject area, they often have an uneven profile of strengths and challenges that is important to recognize (Geller & Greenberg, 2009). The services provided by the learning center should be monitored and documented with progress reports shared with the referring instructor, department, or office. Learning centers offer tutoring (including peer tutoring), course content reviews, writing support, online tutorials, and adaptive equipment such as computers for students’ use. If trained, their staff could help a student address executive function issues related to the planning, organization, and timely completion of assignments, one of the most challenging aspects of postsecondary education for students with HFA/AS (Wolf et al., 2009).

In addition, staff should be familiar with diverse learning styles and the concept of universal design (Rose, Harbour, Johnston, Daley, & Abarbanell, 2008), which is relevant to the individual differences among this heterogeneous population. Many students on the spectrum are visual learners who would benefit from the use of graphic organizers, lists of readings with explicit due dates, written instructions for all assignments, and handouts to support class lectures. In terms of scheduling sessions, standing weekly appointments at the learning center -- rather than random, irregular ones -- could help students with HFA/AS with relationship building in addition to academics.

**Career Counseling.** The vocational support and career counseling needs of individuals with HFA/AS have both been well documented in the literature (Carley, 2008; Hurlbutt & Chalmers, 2004; Muller, Schuler, Burton & Yates, 2003; Shore, 2003; Willey, 1999).

Individuals on the spectrum are often unemployed or underemployed (Hurlbutt & Chalmers, 2004) and generally report negative work experiences, although some have had isolated positive ones. Obstacles to successful employment include the job application process, adapting to new job routines, communicating with supervisors and coworkers, and navigating social interactions in the work setting (Muller et al., 2003). College career services offices can assist students with ASD by providing vocational and aptitude testing, advice about selecting a major that matches their interests and strengths, resume preparation, interviewing strategies, and supervised internships (Wolf et al., 2009).

Because of the high levels of stress associated with the world of work, career services could consult with personal counseling for students with co-morbid anxiety. Career services could also collaborate with their colleagues at the speech-language-hearing center to assist students with interviewing strategies and social-pragmatic language issues, such as asking their employers or co-workers an inappropriately excessive number of questions. In addition, disabilities services can serve as a resource to career counseling to suggest the most effective ways to help a student transition from the college to the workforce.

**Student Centers.** Most colleges and universities have a student center that houses various clubs, recreational facilities, study areas or a lounge. Because these centers are usually more socially than academically oriented, students with HFA/AS might need encouragement from a professor, staff member, or a peer mentor to explore this aspect of college life. In doing so, students on the spectrum might identify a club, activity, or organization that could help them connect with others who share those same interests. Alternatively, students on the spectrum might more easily be engaged in academic clubs and groups offered through the departments.

**Library.** Like all offices on campus, the library can accommodate students with disabilities in a variety of ways. The campus library can serve as an oasis of relative quiet and solace for students with sensory overload, a common characteristic of students on the spectrum. More traditionally, the library can provide resource materials about ASD for faculty, staff, and students. IHEs with programs in education, psychology, speech-language pathology, occupational therapy, social work, nursing, and other health-related fields are likely to already have resources about ASD among

their current holdings, including articles from scholarly journals, magazines, and periodicals, newsletters from relevant organizations, books, films, and other media. Colleges that do not have ASD support programs could expand their holdings on this topic by procuring relevant resources through interlibrary loan or requesting that they be purchased from a general acquisition fund or alternative source. In the last five years, several books have been written specifically for college personnel regarding supporting the needs of students with AHA/AS (Freedman, 2010; Wolf et al., 2009; Zager et al., 2013). In addition, individuals with HFA/AS have written or edited personal accounts that provide first-person perspectives on postsecondary education (Carley, 2008; Perner, 2012; Prince-Hughes, 2002; Shore, 2003; Willey, 1999). Both types of resources are invaluable for those supporting college students on the spectrum.

**Academic Departments and Programs.** Some colleges and universities have academic departments or programs with faculty who have expertise in ASD. These individuals can be tapped to conduct workshops or in-service trainings for other faculty, staff, and administrators. Some of these faculty members might teach in specialized programs designed to train professionals about ASD. Interested college personnel could be permitted to audit these courses, or particularly relevant parts of them, to increase their knowledge about this disability. In addition, academic program areas such as education, special education, counseling, psychology, nursing, social work, occupational therapy, and speech-language pathology could provide students to serve as one-to-one peer mentors for students with ASD. Individuals preparing to work in these fields, in addition to having some background in neurotypical development, should already be experts in the “art” of being college students (Davis, 2012). Peer mentors can assist the student on the spectrum in a variety of ways, including social-emotional support, role modeling of behaviors, the acquisition of new skills as well as the practice of those previously learned, advice (Blumberg & Daley, 2009) and social navigation. These peer mentors would need to be recruited and trained, then supervised on an ongoing basis by experts in the field.

**Residential Life.** For students with HFA/AS who elect to live on a college campus as part of their educational experience, the residential life team can help serve this population. The team of resident assistants

and the resident director can assist these students by responding to issues such as roommate conflicts, noise complaints, disruptive behavior, and adjustment needs. Living in a college dormitory can be a challenge to many students, but can be particularly difficult for some students in this population, especially those with sensory, executive function, and social challenges. The individual with HFA/AS might need specific assistance with personal issues such as how to protect their belongings, including medications (Wolf et al., 2009). For those individuals with HFA/AS who do not want or cannot obtain a single room, Wolf et al. (2009) recommend housing in a residence hall with well-trained, knowledgeable staff who can monitor roommate conflicts and facilitate the student's adjustment to the residential community. Disabilities services can partner with residential life staff to address issues such as sensory overload and social communication challenges, which are common in students with HFA/AS. Prior to enrollment in a residential college, families must make realistic decisions about the readiness of their son or daughter to transition from the structure and predictability of living at home to a college residence. In evaluating the readiness of some students on the spectrum to live away from home, the student, their family members, and professionals who know the individual well need to reconsider the essential functions of living on a campus and interacting with others in a higher education community.

**Centers for Teaching and Learning.** Many colleges and universities have centers for teaching and learning that could provide a venue for faculty and staff development in ASD. Suggested topics include recognizing the behaviors of students with HFA/AS, the process of referral to the disabilities office, the role of executive function in academic success, and the social challenges of ASD. Davis (2012) recommends campus-wide education rather than limiting training to the personnel most familiar with the "neurologically atypical" student such as those in the disabilities or clinical fields. In that case, a broader in-service training that consists of a series of workshops could be open to administrators, students, and staff, and members of the faculty. A center for teaching and learning could provide this information at a one-time event. If that is not feasible, other approaches such as conducting the in-service as part of a faculty development day could be explored.

### **Coordination and Collaboration**

With the increase in the number of students with HFA/AS enrolled in IHEs, colleges face increasing considerations when addressing the long-term needs of their admitted students. These institutions, whether public or private, large or small, have the pragmatic motivation to improve retention and graduation rates. The institutions, as well as the students who enroll in them, are best served when all admitted students succeed. The call for specialized programs for students with autism spectrum conditions is apparent and several have been developed at significant cost to their families. In this era of budgetary constraints and diminishing resources, colleges can exploit their existing infrastructure to find ways to support these students. Until colleges develop specialized programs, their infrastructure might already have resources in place that could be used, expanded, or adapted to meet the unique challenges of this growing population.

While disabilities services can serve as the central point to coordinate this endeavor, other divisions can play an important and collaborative role. Look for partners in personal counseling, the speech-language-hearing center, the health clinic, the learning center, career counseling, the student center, the library, various academic departments and programs, residential life, and the center for teaching to serve students with HFA/AS in unique ways. Campus education and training, peer mentor programs, therapeutic and clinical services, and support groups are some of the ways these divisions can address this issue. Wolf et al. (2009) suggest that the additional divisions of multicultural affairs, judicial affairs, campus police and public safety officers, academic affairs, business affairs, and the upper administration also be aware and involved. All campus resources should be ready to share this challenge. With so many distinct components of the infrastructure involved in this endeavor, coordination and collaboration are key (Pillay & Bhat, 2012; Welkowitz & Baker, 2005). With these coordinated efforts, the institution provides supports that will give the admitted students a fair chance to succeed while demonstrating improved outcomes for retention and graduation rates.

### Future Directions

IHEs that have not yet addressed the unique needs of this growing population should begin campus-wide dialogues and provide education about ASDs to members of the broader college community. An important step would be to reach out to faculty members who might not be familiar with this multi-faceted condition but who have expressed concern about certain students.

Colleges might also consider expanding the menu of accommodations to meet the unique profiles of the heterogeneous population of students with HFA/AS. These students may need accommodations that differ from the ones offered to students with more traditional learning and physical disabilities (Smith, 2007). Colleges that already have programs, or those that have begun to develop them, can inform first year or prospective students that the institution is an ASD-welcoming place. Of course, every campus is unique with its own profile of strengths and weaknesses. Further, providing supports beyond basic access accommodations for their otherwise qualified students is the decision of the institution. In this era of limited budget, non-mandated supports are often impossible unless private funding or a fee-based approach is used.

Finally, all divisions could explore outside funding sources or approach their administrations for support to develop and pilot a program and evaluate it by collecting data reflecting defined outcomes for the students with ASD and other members of the college community. These could include evaluating college-wide in-service training, different aspects of the program such as the success of a support group, completion of coursework, development of career plans, successful integration into the college community, retention rates, and postgraduate outcomes (Jones, 2012). The tasks of this endeavor are many and only with a concerted, coordinated effort can this be accomplished, but the experience can enrich the lives of the members of the college community and its diverse student body.

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## Author's Note

I wish to thank my colleagues in the Department of Speech Communication Art and Sciences at Brooklyn College, Michael Bergen, Susan Bohne, Gail Gurland, and Tim Gura, and an anonymous reviewer at JPED, who provided helpful comments on an earlier draft of this article. Mariana Regalado, Head of Reference in the college library, assisted with literature review.

# (dis)Ability and Postsecondary Education: One Woman's Experience

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## Abstract

The storied experiences of a (dis)Able student negotiating postsecondary education in Canada are highlighted within this article, including advocacy strategies and a critique of related policies. Persons with (dis)Abilities are a particularly marginalized population, traditionally excluded from society, with modern day views of pity or heroics (MacDonald & Friars, 2009). While society has made strides in reducing explicit oppression faced by (dis)Able persons, covert oppressions persist. Pervasive negative assumptions continue to exist about (dis)Able people and have led to the propagation of policies that inhibit (dis)Able people from engaging with society, including being part of the university system. Through a storying process, numerous barriers to accessible postsecondary education will be exposed. Universities are the “think tanks” of tomorrow, a place where critical thought is encouraged and “thinking outside the box” is welcomed. Postsecondary institutions have an opportunity to truly effect change, to pave the way to a barrier free zone, one that is truly accessible structurally and intellectually, providing a welcoming and safe learning environment for (dis)Able students. Through storying the experiences of one (dis)Able student, it is hoped that the reader's consciousness will be raised, barriers to postsecondary education will be better understood and ultimately, fully accessible education can be envisioned.

*Keywords: (dis)Ability, accessible education, narrative/first voice, inclusion*

The population of Canada is approximately 30,893,640 with persons with disabilities [referred to in this article as “(dis)Abilities”] totalling 14% of the population, or 4,417,870 people (Statistics Canada, 2006). Nova Scotia, a province with an overall population of 893,790, has persons with (dis)Abilities representing 20% of the population, or 179,100 individuals (Statistics Canada, 2006). In Canada, 25%, or 6,599,610 individuals without a (dis)Ability have attained a university or college degree, while only 12%, or 534,940 of those with (dis)Abilities have attained a university or college degree (Statistics Canada, 2006; Statistics Canada, 2001a; Statistics Canada, 2001b). Similar statistics are found in Nova Scotia, with 26%

of individuals without a (dis)Ability attaining a university/college degree, while only 11% of those with a (dis)Ability attaining a degree (Statistics Canada, 2006; Statistics Canada, 2001c; Statistics Canada, 2001d). According to Nova Scotia Postsecondary Disability Services, the number of student postsecondary enrolments for the 2009 academic year was 42,628, with 2.64%, or 1,128 students identifying as having some form of (dis)Ability.

Social work, a field that prides itself on social justice and equality, shows similarly low numbers of students with (dis)Abilities enrolled in degree programs: within Canada, 5.5% of Bachelor of Social Work (BSW) students have a (dis)Ability, 4.1% of

Master in Social Work students, and only 1.3% of PhD students (Dunn, Hardie, Hanes, & MacDonald, 2006). Within the United States, “some 28 percent of disabled people ages 25 and older have less than a high school education” and “just 13 percent of disabled Americans over 25 have a bachelor’s degree or higher” (BraunAbility, 2011). The Canadian statistic is very similar, with 12% of the (dis)Able population having university education (Statistics Canada, 2001). The above statistics raise two important questions: Why are there not more students with (dis)Abilities enrolled within postsecondary education? What have the experiences of students with (dis)Abilities been within our universities?

### **Discrimination toward (dis)Able Persons**

People with (dis)Abilities have faced indescribable oppressions. Our underlying beliefs regarding the aberrant nature of (dis)Ability has led to institutionalization, physical and emotional abuse, social segregation, eugenics, and mass murder (MacDonald & Friars, 2009). Whether it be shadows from our past in Hitler’s T-4 Eugenics program, the “mental health hygiene movement” in Canada, present day “do not resuscitate” orders placed on (dis)Able persons’ hospital charts without consent, or the denial of organ transplants for those labelled as (dis)Able, discrimination continues (MacDonald & Friars, 2009; Stienstra & Wight-Felske, 2003). The “mainstreaming” movement (Shah, 2010) has integrated (dis)Able students into public school systems. Postsecondary institutions have established accessibility services on their campuses to help (dis)Able students with access and accommodations to higher education. Yet, universities/colleges continue to possess institutional/structural barriers, attitudinal barriers of faculty and staff, and often a general sense of not knowing how to work with students with (dis)Abilities (Gilson & Dymond, 2012). According to Pingry O’Neill and French (2012), in order to improve upon the likelihood of students with (dis)Abilities graduating from postsecondary institutions, support structures for (dis)Able students need to be enhanced. Further, they found that students with (dis)Abilities most likely to graduate were female, over the age of 23, and had a physical (dis)Ability compared to cognitive or mental health (dis)Abilities. Upon graduating with a postsecondary degree, (dis)Able persons are met with systemic barriers as they try to enter the workforce (Dunn et al., 2006). The Kessler

Foundation found that 79% of their participants with (dis)Abilities were unemployed compared to 41% of non-disabled participants (Cummings, 2010). Hays (2006) found Japanese employers opted to pay fines rather than employ (dis)Able persons. Carter, Hanes, and MacDonald (2012) discovered faculty and staff with (dis)Abilities within university social work programs in Canada constituted less than 5% of the staffing ratio. As much as the (dis)Able have gained rights, barriers remain to be dismantled. The story about to be shared will highlight stigma and barriers toward (dis)Able persons, as well as present an alternative gaze to students with (dis)Abilities within postsecondary education.

### **Method**

Atkinson (1998) acknowledges that it is through story one “gains context and recognizes meaning” (p. 7). Storying allows one to be heard, providing recognition and validation to one’s struggles and triumphs. The storying process can be an empowering engagement whereby the teller reclaims her voice and, in doing so, can deliver important messages of change (Beverley, 2000; Frank, 1995). Melissa, the female student with a (dis)Ability whose story will be the central focus of this article, had years of studying at postsecondary institutions and, subsequently, years of self-advocacy and (dis)Ability rights promotion in the process of gaining access to education and in dismantling ablist barriers that prevented full inclusion of students with (dis)Abilities. Storying her postsecondary education journey had two purposes: one, to empower her through the claiming of voice as her story is shared in printed form and, two, challenging postsecondary educational institutions to listen to Melissa’s story, to learn from her experiences, and ultimately, to promote a more inclusive and welcoming environment for (dis)Able students within universities.

The storying process began through an independent study course in Melissa’s Masters of Social Work program. Melissa worked with Dr. MacDonald over the course of three months, recalling and retelling her life’s journey through her educational process. Dr. MacDonald met with Melissa and her academic tutor bi-weekly during independent study, asking clarifying questions to the storyline, bringing an order and flow to the story, and applying a critical lens in analyzing Melissa’s experiences. Prior knowledge of Melissa’s journey was known, as Dr. MacDonald had taught

Melissa in a (dis)Abilities course during her undergraduate social work degree. The School of Social Work had stood beside Melissa during a challenge to the Department of Community Services. Further, articles had been written about elements of Melissa's story and these were reviewed and included in the storying process. For example, The Daily News (a local newspaper) ran a story with the headline, "Get a Job, Student Told: Woman cut off income assistance as she tries to get qualifications to become a social worker" (October 20, 2007).

In total, there were six newspaper articles and two magazine/newsletter articles that were reviewed (CBC News, 2007; Jackson, 2007a; Jackson, 2007b; Lambie, 2007; McNutt, 2008; Myers, 2000; Northwood Home-care, 2010). In addition, Melissa had written specific segments of her story in academic assignments and these were used to clarify memories. Melissa and Dr. MacDonald worked together creating the manuscript. With the aid of her tutors, Melissa wrote the initial story. Dr. MacDonald read and re-read the story, pulled out key themes, asked for points of clarification, brought a theoretical and methodological lens to the process, and performed numerous edits. This article is an example of a student with a (dis)Ability working with a faculty member collaboratively to bring the story forward to the readership. All parts of this article have been reviewed by Melissa and her noted changes incorporated.

As part of the empowerment process and in recognizing that language is powerful, "disability" has been specifically chosen to be written as (dis)Ability. In writing (dis)Ability this way, Melissa's tremendous abilities are recognized as she, like others with (dis)Abilities, has learned creative and endearing ways to navigate societal ablist barriers that are imposed upon (dis)Able persons. At that same time, her identity as a (dis)Able person is maintained (MacDonald & Friars, 2009).

### Melissa's Story

I was born with cerebral palsy, a muscle and movement disorder caused from oxygen deprivation during childbirth (Straub & Obrzut, 2009). This (dis)Ability can affect individuals differently; in my case, cerebral palsy affected both my fine and gross motor skills. I am primarily affected by choreoathetotic cerebral palsy associated with abnormal, uncontrollable,

writhing movements of the arms and/or legs, caused by increased deep tendon reflexes (Cans, 2000). Over the years I have worked hard on trying to control these movements. To compensate for my physical (dis)Ability, I have used an electric wheelchair since the age of four. In addition, due to my limited fine motor skills, I have had an assistant working with me, with duties ranging from personal care to academics. Just months before I graduated high school, I was diagnosed with a learning (dis)Ability, which predominantly affects my memory and comprehension. I remember leaving the resource room after being told my diagnosis; I went into the library, a quiet place, where I was confronted with emotions ranging from relief to sadness. I finally understood why I had been having trouble in school, but I questioned what this meant for my future. While I understood the challenge of postsecondary education due to my physical (dis)Abilities, I knew little about managing a learning (dis)Ability within a university setting. This was a new diagnosis for me and I struggled with coming to accept it as part of my (dis)Ability identity. Further, I had received little advice on how to cope with my learning (dis)Ability. All I knew was that I was not willing to give up on my goal of postsecondary education.

**Access re: Physical Barriers:** Long before many of my peers, I decided that I wanted to pursue education beyond high school. However, unlike most of my peers, I had to consider not only the geographical location of the programs but their structural access as well. I had narrowed my career options down to three: lawyer, interior decorator, or social worker. After considering the physical accessibility of the local law school, it became apparent that entering Law might not be in my best interest, so I applied to a local university for a Bachelor of Arts and the local community college for an Interior Decorating course. I was accepted to both programs; however, the college with the Interior Decorating course was located 1.5 hours outside the city, making living arrangements and personal care complicated. The university had on-campus accommodations for a variety of (dis)Abilities, leading one to assume it was (dis)Ability friendly.

In preparation for my beginning semester, my parents and I arranged a meeting with two counselors, one specializing in physical (dis)Abilities and the other specializing in learning (dis)Abilities, at the on-campus resource and support centre for students with (dis)Abilities. I openly discussed my abilities and

the educational accommodations I had received within the public school system. I was pleasantly surprised to hear about the resources and accommodations that the Centre could offer. To achieve the full benefit from my educational experience I relied upon the services of an academic assistant, which I was assured by both counsellors would be readily available. I felt confident about beginning this new venture.

On my first day of university I went to the Centre to find out who had been assigned as my academic assistant for the year. To my great surprise, I was informed that the Centre did not supply academic assistants, but would help me take the necessary steps to acquire an assistant on my own. I felt absolutely devastated by this news; my first class was later that day and I was not at all prepared to attend it without an academic assistant. The confidence that I felt when I initially wheeled onto campus that morning was shattered. I found out very quickly that I was going to be learning a lot about life and how to survive yet another ablist, inaccessible environment. I certainly did not feel qualified to hire an employee. The Centre would help create flyers advertising for an academic assistant that I could post around the campus. Imagine my dismay; I am a wheelchair user who does not have the full use of both hands. This was a campus that I was not familiar with, a campus that was not fully accessible, yet I was suppose to navigate through campus sticking posters on bulletin boards. I could not believe an accessibility centre did not instantly acknowledge how this task would be physically challenging, if not impossible, for me to achieve. Upon raising this issue I did receive their assistance. However, I find it tiring to always have to explain my realities. Hughes (2012) writes, “disability is a life lived before a looking glass that is cracked and distorted by the vandalism of normality” (p. 68). Our realities, what we have to do daily to survive in an ablist world, are not recognized by the able-bodied majority.

In the meantime, I still did not have an assistant to help me with my coursework. The Centre’s solution to this was to send letters to all of my professors indicating that I would need a scribe, or note-taker, to assist with writing lecture notes. I found it very intimidating to rely on perfect strangers to handle such a crucial task. I can recall waiting in the classroom for lectures to start, watching the door, and wondering, “Are they going to show up today?” While I was waiting for applicants for the academic assistant position, I still

required help with other aspects of my coursework, such as reading course material and completing assignments. It was through the support of my father and an at-home tutor that I was able to complete my coursework. Three mornings a week, I would receive tutoring services from a tutor who had been working with me since grade 11. After working a full day, my father would come home and assist me with the rest of my schoolwork. While I was thankful for my father’s time, effort, and assistance, it was incredibly difficult and frustrating for me to have my father assist me with my schoolwork at a university level. I felt as though there was a constant barrier in my way; emotionally, I felt frustrated and ashamed. Here I was in university as a young adult striving for my independence, as most of my peers were at the time; yet, I required the help of my father to meet my course requirements.

Inaccessible university environments seemed to follow me no matter what institution I attended. The university where I did my undergraduate arts degree had a reputation for being (dis)Ability friendly, yet I struggled with accessibility issues at the beginning of my degree. The university where I did my social work degree presented new challenges. On my first day, I had difficulty navigating the campus as it was scattered throughout several blocks, which was both intimidating and confusing. What should have been a simple task, such as obtaining a university ID, quickly became a very difficult task. After tracking down the location where university IDs were issued, I discovered that the building was not accessible, as I stared up at a dozen stairs to the front door. Frustrated, my tutor went into the building while I sat outside. She explained that I was a wheelchair user and needed my student ID. She was informed that I could go to the Student Union Building, which was accessible, to get my picture taken for my university ID. Immediately, the message I received was that I did not belong at this institution. I had identified on my application that I had a (dis)Ability, yet no one contacted me to let me know that I couldn’t access university services in the same manner as other students. I felt like a second-class citizen.

After finally getting my ID, we proceeded to my first class. Upon arriving at the building where my class was being held, we discovered that the elevator was out of service. First day of classes in the opening semester of the year and the elevator was broken. Again, the message I immediately received was that students with (dis)Abilities did not matter and, in fact, were not

welcome at this institution. I felt like going home. Instead, I contacted the co-ordinator from the on-campus (dis)Ability services and explained my situation. She came to the building and inspected the situation. Her solution was to simply have someone lift me, and my chair, up the stairs. I could not believe it, she did not account for the fact that my wheelchair weighs 300 pounds, not including my own bodyweight, nor did she think about how I might feel about having strangers carry me up the stairs. Another solution was to get the placement of the classroom changed. Fortunately, this happened with relative ease and I was able to attend the first class of my BSW program. While at the time, this was a very frustrating and discouraging event, I can now look back on it and chuckle about the antics of that first day at my new university.

My first day was not my only encounter with inaccessibility on campus; in fact, it became a recurring theme. I could not enter through the front doors of the building that housed most of my classes; instead, I had to go around to the back of the building. It almost felt as though the university was too ashamed to have someone who was not able-bodied use the main entrance. The building that housed the School of Social Work offices was also inaccessible; while it was equipped with a ramp, the doors were not automatic and were very difficult to manoeuvre through with a wheelchair. Plus the offices of the professors were located on the second floor of the building, a building with no elevator. If I wanted to meet with a professor, a call had to be made asking the professor to meet me in the conference room on the main floor. Normally, these would be things that I could do on my own; however, this lack of accessibility severely decreased the level of independence that I was used to. Dunn et al., (2006) found that “many schools of social work remain structurally inaccessible, and as a consequence, potential students, staff and faculty with disabilities are denied opportunities for education and/or employment” (p. 2).

Entering my second year of the Master’s program, the School of Social Work moved into a new facility, which was championed for its environmental friendliness. It is significantly more spacious and thus easier to manoeuvre within than the former structure. Access to the building does include an automatic door, however, once inside the building there are no accessible doors. I find this to be offensive, as though I am allowed to enter the building, but not entitled to attend classes, or use the graduate facilities without eliciting

the assistance of another person, thus reinforcing the assumption that (dis)Abled persons are dependent. This facility is located centrally on campus and has two elevators with voice activation, so it would require both of them to break down before it would be suggested that I get carried up the stairs. And, I can now visit professors in their office instead of them having to meet me elsewhere.

In addition, the sidewalks were treacherous, particularly in the winter months. While able-bodied individuals can simply traverse through deep snow, I am unable to do so. Often when the sidewalks are ploughed, the snow is placed on the curb cuts; of course, these curb cuts are what allow me to cross the street. Several times, I found myself stuck in the snow required the assistance of one to two people to help me get out. Although I have lodged several complaints about this issue to the coordinator of the accessibility centre, five years later, it still happens.

While the university had (dis)Ability services similar to that of the university where I attained my Bachelor of Arts, I did not find the environment to be nearly as welcoming as I’d grown accustomed to at the Centre. The (dis)Ability services at the university was very business-oriented; it didn’t feel like a place that I could go if I had issues or concerns. In my third year, a new facility was built to house the services; a facility that was supposed to be more accessible and better suited to students’ needs. On the contrary, while perhaps this move may have benefited some individuals, it made the services significantly less accessible to individuals with physical (dis)Abilities, particularly those who use wheelchairs. For instance, if I required a meeting with one of the co-ordinators or if I required a private room to write an exam, I would have great difficulty, as my wheelchair cannot fit in either space. Ironically, in a (dis)Ability resource centre, my options are to meet with staff in the lobby or park my chair in the doorway of an office or exam room. With both options, my rights to privacy and confidentiality would be breached. Because I was very uncomfortable with the services at my new university; I was fortunate to be allowed to continue using the services of the Centre at my former university. While this may seem inconvenient, I am incredibly appreciative and thankful that I am able to continue using these services. Additionally, it has allowed me to maintain relationships with the staff, who have assisted me throughout my academic career.

I entered the university for my social work degree immediately dealing with physical barriers and, as that degree was about to be conferred upon me, structural barriers were still infringing upon my rights. Convocation is a time in a student's life where one should be able to let loose and enjoy the festivities; yet for me, this was another instance I felt personally excluded due to the lack of accessibility. In the fall of the final year of my BSW degree, I tried to be proactive in meeting with the co-ordinator of convocation in order to deal with anticipated accessibility issues. Upon meeting the co-ordinator at the arts centre, I was shown the layout of the auditorium where convocation would be held. There was no ramp and no intentions of installing one due to building regulations. The co-ordinator presented two options: I could stay behind the stage during the whole convocation, meaning I would not enter nor exit the auditorium with my peers, nor would I be sitting with them. Or, I could enter the auditorium with my peers, but when it came time for me to cross the stage and accept my degree, I had to exit through the back of the auditorium, go through a back entrance, and enter the stage from the side.

Neither of these options was satisfying to me. At my first convocation for my BA a ramp was installed, which allowed me to experience convocation just as any other student who attended that day. When I voiced my concerns to the co-ordinator, she informed me that I should be content with these options, as the university had many students with (dis)Abilities partake in convocation in this manner and no one had ever complained. I can only speculate that these individuals felt as though they had no other option but to comply. I considered whether I would actually attend convocation – I did not want to be isolated from my colleagues. However, I had been looking forward to this moment for quite some time, not to mention the fact that my parents were looking forward to the ceremony. Ultimately, I decided that, despite the situation, convocation was important to me and I would not miss it simply due to poor planning and lack of accessibility. Unfortunately, at the convocation for my BSW, I was made to feel as though I was different, as though I did not belong with my peers. Despite my feelings of displacement, I made the best of my convocation with the support of my friends and family.

**Learning:** Burgstahler and Cory (2008) identify a process for implementing Universal Design (UD) in physical spaces, whereby UD is defined as “the pro-

cess of creating products, which are usable by people with the widest possible range of abilities, operating within the widest possible range of situations, as is commercially practical” (p. 12). One of the steps in this process is to define the universe by considering the diverse characteristics of the population using the space. Universities need to consider the spatial needs of (dis)Able students, creating physical infrastructure that is accessible and thus welcoming to all students.

**Accommodations:** In one of my very first classes at the beginning of my postsecondary education, I noticed that one of my classmates was hearing (dis)Able and she had the assistance of an interpreter. In an effort to join with another student with a (dis)Ability and wanting to find out how she managed to hire her assistant, I introduced myself and directly asked how she went about the hiring process. She informed me the Centre supplied interpreters for hearing (dis)Able students. Immediately I felt devalued, as I was not important enough to have an assistant hired to help with my school needs. I also felt guilty for even questioning why she should have a sign language interpreter, for of course she was entitled to this assistance and no one should know that better than I. But I had learned at an early age that I needed to advocate for myself in this ablist world, so I asked for a meeting with a counselor at the Centre and questioned why interpreters were provided by the Centre, free of charge, to hearing (dis)Able students, yet they did not provide academic assistants for students with physical or learning (dis)Abilities? Financial constraints limited the resources of the Centre and they chose to hire American Sign Language interpreters. I could not help but feel as though I was being told my needs were not a priority. “Disabled people are not a homogenous group; we are diverse and impacted by different oppressions” (Withers, 2012, p. 11). And, therefore, our needs can be quite different. The accommodations that I initially believed to be available from the university were not forthcoming. Partly, I blamed myself for being in such a predicament. I felt I should have asked more questions and sought clarification in my initial meeting with the Centre. If I would have been more precautionous, or less naive, I could have avoided this situation. I was desperate to find someone to help me, and it took a month and a half to hire someone.

I was very nervous about interviewing the applicant; I had never had to go through this process before. I was worried about asking the right questions

and whether, upon meeting me, the applicant would still be interested in the position. Over the years, I have employed 11 academic assistants. Some individuals I will remember forever and will remain lifelong friends with, some are just as memorable, but for opposite reasons. It is a stressful situation to hire individuals year after year, but it has been an amazing way to meet people. I believe, overall, I have learned a great deal from each individual I have worked with and I would like to think that they have learned a lot from me, too, from issues relating to my (dis)Ability and beyond. Often, I can tell that people have learned from me. From when we begin working together to when we finish, I can see a shift in their thinking. I think that, to a degree, they can see things more clearly through a lens that is similar to mine.

I learned a valuable lesson - not to take information at value as I did in my initial meeting with the Centre. This created the groundwork for my thinking, where I review all possible outcomes to a situation. (dis)Able persons cannot afford to be spontaneous, as the negotiation of societal barriers requires thoughtful planning. Paterson (2012) notes, "the ablist nature of temporal norms means" that people with disabilities "find it nigh impossible to acquire and sustain the physical and cultural capital necessary to participate in everyday social encounters" (p. 166). It takes time, energy, and thought to navigate the tremendous barriers imposed by an ablist social structure, such as a university. In this ablist world, the Centre became somewhat of a refuge, as it provided a setting where students with (dis)Abilities could socialize. Speaking to others who understood the unique experiences and struggles related to being a student with a (dis)Ability helped keep me grounded.

For the most part throughout my postsecondary education I encountered a great deal of support and understanding from my professors when seeking accommodations. However, during my first degree there was one professor who was not as supportive and certainly not understanding of the issues that a student with a physical (dis)Ability faces. The Centre provided me with accommodations, including exam accommodations, which allowed me to write my exam within the Centre with an extended timeframe, as opposed to in the classroom. Due to my physical (dis)Ability, I also needed to verbalize my exam responses to an assistant, who would then write down my answers. In a normal classroom setting, this would be very distracting to

my classmates, plus they would hear my responses. At the beginning of each semester, professors receive letters from the Centre highlighting students' accommodations. As per my routine, I wrote my first exam at the Centre. During the next class, I found out the professor had given students the answers to two exam questions while they were writing the exam in the classroom. I waited until I received my graded exam to see if I received points for these two questions, I did not. After class, with some hesitation, I approached the professor about not receiving the same two points that my classmates received. I kindly asked the professor if I could also have these points, explaining that, due to my (dis)Ability, I do not write my exams in-class. The professor's response was, quite literally, "It sucks to be you." He explained to me that regardless of my situation, it was not his fault that I was not in class to write the exam. I was absolutely shocked and speechless that a professor, an educated individual, would speak to me or anyone else in such a manner.

After some thought, I discussed the matter with my counsellor at the Centre. The counsellor advised me to contact the university conflict resolution advisor, whom I met with to discuss the matter. The conflict resolution advisor then contacted the professor in question to discuss the incident that occurred. The next class I had with that professor, he asked that I stay and talk with him following class. Being nervous and apprehensive, I asked my academic assistant to stay with me. The professor said he was very upset that I had gone to the conflict resolution advisor regarding my concerns with his professional conduct and asked why I did not discuss the matter with him. This left me feeling very frustrated because I had approached him regarding the topic. I reminded him of his comment, at which point he apologized and awarded me the two points on the exam. No other issues arose during the remainder of the semester with the professor. Despite the frustration that I felt over this situation, I would like to think that this experience educated the professor about some of the issues that students with (dis)Abilities face, predominantly the issue of equality. According to Madriaga, Hanson, Heaton, Kay, Newitt, and Walker (2010), many of the difficulties that students with (dis)Abilities face can be attributed to professors' lack of knowledge regarding (dis)Ability.

**Learning:** Staff at university accessibility centres, administrators, and faculty need to be cognizant of the different needs of (dis)Able students. They also need

to be mindful of not creating an environment whereby one (dis)abled student is pitted against another (dis)abled student or against the student body. Dunn et al. (2006, 2008) note that attitudinal barriers need to be challenged and dismantled within our university structures, and that consciousness-raising workshops should become mandatory for all faculty, staff, and administrators so that inclusive education is not only possible, but also embraced.

**Personal Care Dilemma:** Prior to university, I accessed the help of an agency for personal care. However, because I was attending university, the agency deemed that I no longer qualified for care as they provided *homecare*, not care for individuals while at university. I still required personal care, whether I was at home or at university. The Department of Education was willing to provide funding for an academic assistant and tutor, but they were not willing to provide funding for 2 – 3 hours per week of personal care services at the university. This was yet another barrier blocking my access to postsecondary education. I spoke with the Centre, who referred me to the on-campus nurse, who agreed to assist me with personal care at specified times. While the situation was not ideal, I felt the university was going above-and-beyond to facilitate access to education. I was just happy to have the personal assistance I required.

Sometimes we find opportunities in the most unpredictable places. An introductory English class assignment was to write an article, on any topic, with the bonus that if a student was able to get his or her article published in the local newspaper, the professor would award the student with a letter-grade increase. Being the person that I am, I jumped at the opportunity to have my voice heard as well as be rewarded with bonus points. My article was published in the November 8, 2000 issue of the local newspaper, *The Chronicle Herald* (Myers, 2000). In this article, I discussed several of the issues that were dominating my life at the time: government policies, issues with life on campus, and the lack of organization at the university regarding academic assistants. Within 24 hours of the article being published in the newspaper, I received a call from the Department of Education, informing me that funding would be provided for a personal care worker.

While receiving the homecare services, I asked one of the young workers, “What kind of training have you had?” to which she replied, “I haven’t had any

training.” Upon further questioning, I found out that she, like many others, not only lacked personal care training but also lacked basic first-aid training as well. The final straw with this agency occurred when one of the homecare workers assisting me came to work with high heels on. While this may not seem like an issue, I require the aid of my homecare worker to assist in transferring me from my chair to other places I would like to sit, and high heels made this dangerous for both of us. Working with this agency became a safety concern; however, I had no alternative. Looking back, I should have filed a complaint with the agency. I was under so much pressure with school and trying to navigate the structural barriers, however, that I could not envision taking on another battle at that time.

Within weeks, I was also contacted by the agency that had previously rejected me as a client, informing me that the agency reconsidered their policy on homecare and that I now qualified to receive personal care from the agency, be it at home, the university, or the workplace. This is a perfect example of the power of social action. Had I not voiced my concerns in an open forum, such as a newspaper, I may not have received the services I was lobbying for.

While it is incredibly advantageous to have personal care services while on campus, it is not without its challenges. The agency had difficulty understanding that providing care at a university or workplace was much different from providing care within the home. A university student is on a structured schedule, thus requiring the homecare worker to arrive on time. On a number of occasions I was late for class due to the homecare worker being late for our appointment. This left me with an uneasy feeling, as I was now the tardy person appearing to be inconsiderate of the professor’s time by interrupting the class and my classmates.

I was thrilled with the reception my article received; however, the university did not share my sentiment. The President contacted my counsellor at the Centre requesting a meeting. I was shocked that I was being called into the counsellor’s office, only to be told that I should write a retraction to my article in the *Chronicle Herald*. The university was very upset with the picture that I painted of the accessibility issues on campus. I asked, “Was what I wrote accurate?” While the counsellor had no response, I felt in my heart that what I wrote was true and, unless the accessibility of the university changed dramatically overnight, I had no intention of retracting my statement. One newspaper

article facilitated access to resources that I had been fighting for and, despite this, the university criticized my view and my voice. Fortunately, the issue was quickly dropped and was never raised again by my counsellor or by the university.

**Learning:** Snyder and Mitchell (2006) call for ways to destabilize dominant ways of knowing (dis)Ability, while Titchkosky (2007) believes we need to unsettle how (dis)Ability is understood within our societal context, “as a clear cut problem in need of a solution . . . as an undesired difference, . . . as an add-on” (p 7). People with (dis)Abilities and their allies need to bring ablist issues to the public in order to promote change. Media sources are a vehicle that can be used to meet this goal.

**Fighting for Policy Change:** My first real barrier related to starting university occurred before my first semester had begun. Both my parents and I believed I would be able to access (dis)Ability benefits through the Nova Scotia Department of Community Services (DCS), once I reached my 18th birthday. These benefits would help support my university education. However, unbeknownst to me, (dis)Ability benefits were only available to individuals studying at community college, not university. Additionally, I was advised by DCS that, if I opted to stay home and not attend postsecondary education, I would be fully entitled to (dis)Ability benefits. I was outraged, as the inherent message I received was that (dis)Able persons were not intelligent enough for university or that the investment into our futures was not justified. It felt like an education ghettoization. Furthermore, the courses at community college are primarily trades-based and ‘hands-on,’ an obvious obstacle with my physical (dis)Abilities. Frank (1997), in his work on illness narratives, identifies how professionals categorize individuals or “interpellate” people into slots with the intention of making people feel as though they belong in the slot to which they were assigned. I felt as though I was being placed into a slot labelled “useless.” Mackelprang and Salsgiver (1996) identify society’s perception of (dis)Able persons as incapable of entering into the workforce.

Despite my hurt feelings and shed tears, I opted to use this situation as fuel to pursue my career. Very little was expected from me as a young (dis)Able woman and I wanted to prove them wrong. I had already made up my mind to work towards a degree in social work, so neither staying home nor attending community college was an option. I did not feel that I should be penalized

by DCS for my educational choices. Further, I believed the policy to be discriminatory; therefore, I opted to appeal the policy. The choice to appeal DCS’s policy on postsecondary education was an enormous undertaking, which I had not entirely anticipated. I questioned whether I would be able to manage appealing the DCS policy on top of pursuing my first year at university. I was scared that I could be fighting an impossible battle and would end up hurt in the end. However, this was a chance that I was willing to take, as my need to achieve my goals far surpassed any fears of failure.

The first appeal I filed was denied. However, I was unwilling to give up the fight, for I believed the policy to be truly unfair and oppressive. The battle was on and it took nearly one year, my entire first year of university, to gather political support. Initially, I sought the help of my Provincial Member of Legislature (MLA); however, it quickly became apparent that he was not interested in advancing my case. My next step was to contact my Federal Member of Parliament (MP). Within a very short time, my MLA, pressured by my MP, began advocating with me to change the policy. He suggested that I contact the Minister of Community Services. To my surprise, the Minister not only agreed to meet with me regarding my struggle, but he also agreed to meet with me in my own home, which I interpreted as a respectful accommodation for a (dis)Able person. I found this to be far beyond the call of duty and, to this day, I am still incredibly thankful for the support that I found within my MLA (albeit with hesitation), my MP, and the Minister of Community Services. Fortunately, after advocating for the amendment of this policy for over one year including the denial of my first appeal, the Department of Community Services amended their policy on postsecondary education, thus providing benefits to individuals with (dis)Abilities who chose to attend university. I was excited that the policy was amended and it was gratifying as a nineteen-year-old woman to have played an instrumental role in this process of policy change. Malhotra (2001) writes, “the first step in the liberation of disabled people (is) . . . a fundamental paradigm shift.” There needs to be a major shift in how society views (dis)Able people, especially in its legislative acts.

This was not the end of my political lobbying, for just as I was about to begin my social work degree I found out my understanding of the DCS policy on postsecondary education and (dis)Abilities was incor-

rect. While I had been under the impression that DCS would offer (dis)Ability benefits throughout one's entire postsecondary education, this was not the case. In the fine print of the policy, DCS noted that (dis)Ability benefits would only be made to individuals who were enrolled in their first degree or program of study; these benefits did not extend to a second degree or program of study. While my caseworker was aware of my intentions to pursue another degree, over the six years I worked with her while going to university, she never once mentioned that I would be cut off from my (dis)Ability benefits when I began my second degree. Not surprisingly, I was shaken by this news and, after years of remaining strong, I had enough-- tears filled my eyes, and I was overcome with emotion.

Going through this battle once in my life was more than enough; realizing I was back where I began left me feeling defeated. While I have always considered myself a strong woman, I felt my determination and strength drain out of my body. After all that I had already been through in fighting for my rights, I questioned whether I should just give up and comply with the policies of DCS. The advice of my caseworker was, "Just get a job." Unfortunately, a Bachelor of Arts, even with a double major in Psychology and Sociology, would not assist me in getting a job, especially not one in social work. It was almost as though I was looking down on myself and I could see myself shaking my head and asking, "Do I want to go through this again? Do I have the strength to go through the process again?" I reviewed the process that I had gone through to receive my (dis)Ability benefits for the first degree and decided that, if I was successful once, then I could be successful again.

As I began my first semester of my BSW, I started lobbying the Department of Community Services to change their policies. Similar to my first run-in with DCS, I tried to go through the appeal process myself, without government or legal assistance. However, once again my appeal was denied. The next step was to contact my still-reluctant MLA (Member of Legislative Assembly) as well as my MP (Member of Parliament). At this time, I also discussed my issues with a professor, who advised me that my issue was a human rights issue. She advised me to contact a legal aid lawyer; I promptly set up a meeting. With this support, I figured I had nothing to lose and everything to win. My lawyer assisted me with the appeal process and also suggested that I set up a meeting with the Minister of Community

Services. Unfortunately, unlike the Minister who was more than willing to help me in my initial dealings with DCS, the current Minister would not return my calls. In the end, I not only had support from government officials (my MLA and MP) and a lawyer, but I also found support from the School of Social Work through several faculty members. My lawyer suggested I call a press conference to publicize the current policy and to determine if others were experiencing similar oppression. I was surprised by the number of individuals who attended this press conference in support of my struggles – and in several cases their own – with DCS. I also found a great deal of unexpected support through strangers who became familiar with my story through local news programs as well as the local newspaper (Canadian Broadcasting Corporation, 2007; Jackson, 2007a, 2007b; Jones, 2007; Lambie, 2007; McNutt, 2008). Several individuals sent letters to the editor of the newspaper, condemning DCS, and showing support for my cause. I had strangers approach me to offer their support.

The media aided in connecting me with individuals who were going through similar circumstances to my own. The Director of the School of Social Work was not only in attendance, but was also a speaker at the press conference, along with myself, my lawyer, and an advocate from the students' rights organization. After the press conference, I received many responses from others affected by DCS's social policies. I also learned later that professors from the School presented briefs to the Law Amendments Committee of the Legislature on this Act, supporting my case for accessible education. Ultimately, my issue was acknowledged and the Government of Nova Scotia (2008) overturned their original decision. The policy now states,

Assistance for a second degree will be provided only in cases where the first degree may be considered a pre-requisite to further study (e.g. B.A. for a B.S.W.) or the student is enrolled in a concurrent degree program (e.g. B.A. and B.Ed.). Career Seek will provide support for undergraduate degree programs only, and will not consider requests to support graduate, master or doctoral programs. (para. 6)

While this may seem like another happy ending to my dealings with DCS, unfortunately, this victory was bittersweet. As I had already begun my second post-

secondary degree, I did not qualify for the (dis)Ability benefits. The ruling would only apply to individuals who were going into their second degree, not those who had already begun their second degree. I was very disappointed in the loop-hole but I was thrilled that I had made a difference in some (dis)Able students' lives. Although the policy was again amended, and I was ultimately successful, a part of me felt as though I had lost the battle.

**Learning:** According to Goode (2007), it is only when people with (dis)Abilities become “extra-visible” that their needs are met. Social policies need to be in the best interest of (dis)Able persons and not anchored in misperceptions of idleness, or the inability to contribute to community and societal capital. People with (dis)Abilities “are entitled to receive the support they need within the ordinary structures of education, health, employment, and social services” (Rioux, 2009, p. 205).

**Supports:** While my story has many low points, there are many high points that deserve recognition. Primarily, I feel as though none of this would have been possible without the support from my parents and other family members, tutor, academic assistants, professors, and the staff at the Centre. Throughout my education, my parents have always supported my decisions. While I was concerned about my first year of university, they reminded me that if it did not work out, at least I gave it my best shot. This journey has been difficult for me, it has also been difficult for my parents, and I am grateful for all the support that they have provided over the course of my education. In addition to the emotional support that my parents have provided, they have also provided the means for me to obtain my education. I live nearly an hour away from the local universities with only my parents as a means of transportation, so I could not have attended university without them travelling an hour in the morning and an hour in the evening.

Another key player in the success of my education has been my tutor; the same individual who stood by me in high school has continued the journey with me through postsecondary education. Despite all of the supports I have received, it has been the support of this individual that has kept me grounded.

Lastly, I am thankful for the support that I have received from the Centre. I strongly believe that if I would have begun my postsecondary studies at the university where I obtained my second degree, that I

would not have completed my first degree. The Centre provided me with support and opportunities that allowed me to gain a sense of self that I may not have otherwise achieved. While I have been a strong advocate for many causes, even prior to my postsecondary experiences, the Centre afforded me the opportunity to hone my skills. I participated in several media pieces, including being interviewed for the alumni magazine regarding the Liberated Learning Project, as well as participating in a Canadian Broadcasting Corporation (CBC) radio broadcast along with the Director of the Centre where we discussed the potential obstacles for students with (dis)Abilities in exchange programs abroad.

I was also given the opportunity to provide thank-you speeches to several high-profile individuals. This included the Lieutenant Governor as well as Rick Hanson, a man who - despite a spinal cord injury - travelled across the globe in his wheelchair to increase awareness about accessibility and inclusion. I also advocated for funding for the Centre. Typically, it was the Director of the Centre who asked me to participate in these functions, which I found, and still find, incredibly humbling. Despite all of my struggles during this period of my life, it felt as though there was a purpose to my suffering because I was actively (and at times, unintentionally) paving the way for students with (dis)Abilities within postsecondary education. The opportunities that I was given by the Centre, in retrospect, truly outshone the barriers that I encountered.

There are many reasons why I have made it to where I am today. It would be selfish to say that I did it on my own because, without all of the support that I have received across the board, I could not have made it this far. I look forward to progressing through the final stages of my education and, more so, I look forward to stepping into the workforce where I can finally utilize my skills and life experience to the fullest.

**Learning:** According to Stienstra (2012), “honouring the dignity, autonomy and rights” of people with (dis)Abilities “enables all of us to stretch and enhance our understandings of what it means to be human and live in a world of relationships of support and care” (p. 79). Becoming allies to people with (dis)Abilities and together working toward equitable treatment - be it in education, health, or social circumstances - makes for a more inclusive and egalitarian world.

## Discussion

Stories provide context; they show glimpses into our past and, in so doing, project future possibilities (White, 1995). According to Frank (1997), the most common stories told “are stories of minor resistance” (p. 35). The story Melissa shared here is not complete; it is but one lens into what her life was like as a woman with a (dis)Ability accessing postsecondary education. Represented in the storyline are elements of her resistance toward an inaccessible society. Throughout her educational experience, others have often viewed her journey as inspirational. She would disagree. Overboe (2009) refers to this as “disabled heroes,” the glorification of (dis)Able people’s lived experiences, which creates unrealistic expectations whereby all (dis)Able people are expected to live up to the highest standard achieved by any one (dis)Able person. Inadvertently, this invalidates the experience of (dis)Able people. Moving forward, it is important to remember that “disabled people continue to be portrayed as more than or less than human, rarely as ordinary people doing ordinary things” (Oliver, 1990, p. 91). Although Melissa does experience real and numerous barriers in life, her story is but one of many (dis)Able persons. She does not want to be glorified, nor does she want to be pitied. She simply wants to be treated equitably by having her (dis)Abilities accommodated. Societal education needs to take place for this to become an ongoing reality for the (dis)Ability community; concepts of oppression and domination need to be understood. The myths and stereotypes associated with accommodating (dis)Able students’ educational needs have to be dismantled.

Dominance is perpetuated through the concept of meritocracy, which suggests that anyone can get ahead through skill, hard work, and a positive attitude (Moreau & Leonard, 1989). Persons with (dis)Abilities can work hard but, if the opportunities are not present and barriers are not addressed, there is a greater possibility that they may not benefit from their hard work. Within Melissa’s story, if academic accommodations had not been made, if environments were not made accessible, and if the Department of Community Services’ policy had not been amended, she would not have been able to attend university. Her future prospects would have looked significantly different. Most likely, she would have either remained on (dis)Ability pension for the rest of her life or she would have gone

to an employment workshop to be paid minimum wage. Either way she would have ended-up living in poverty by joining the poorest of the poor, women living with (dis)Abilities (MacDonald & Friars, 2009). Irrespective of her (dis)Ability, she had a dream to become a social worker. Melissa asked, “Why should my dream be any less attainable than an able-bodied person’s?” Universities have a golden opportunity to promote human rights and equitable treatment and to increase their enrolments by attending to the needs of the (dis)Ability community. Postsecondary institutions need to challenge attitudinal and physical barriers so that students with (dis)Abilities are welcomed and included in university life (Carter et al., 2012; Dunn et al., 2006; Dunn Hanes, Hardie, Leslie and MacDonald, 2008).

University programs need to be flexible with their rules and regulations, as illustrated by Melissa’s request for two rule exemptions during her Masters. First, she asked to begin the program during the summer months prior to the program start date of September. This allowed her to spread out her course work into a more manageable schedule. The timing worked with her academic assistant, whereas the fall was going to present conflicts in scheduling. Second, as a campus student she requested to be able to take a distance course, which traditionally is not available to campus students. This provided a more accessible environment for Melissa and met with her learning needs. Distance delivery, with the intentional addition of universal instructional design, can be an important addition to increasing students’ access to postsecondary education (Burgstahler & Cory, 2008). If she had not been granted these rule exemptions, she still would have completed her degree but it would have been more difficult. Coriale, Larson, and Robertson (2012) state, “schools must attempt to understand and work with the individual context and diverse needs of each student with a disability” (p. 431). Thinking beyond regulations, rules or policies to creatively accommodate students with (dis)Abilities is essential for an accessible education.

Within Melissa’s stored experiences advocacy was a recurring theme - advancing the issues not solely for her own interests but for the well being of (dis)Able students. Not everyone has the ability or resources to advocate on their own behalf or on behalf of others, however, nor should they be expected to carry this burden. Melissa came out of her mother’s womb ready to tackle the ablist structures and barriers that she has encountered and will continue to encounter throughout

her life. Advocating for the rights of those on the margins defines Melissa's work and social commitment, but it should not be an expectation for Melissa or for any other student with a (dis)Ability. The fight should not be this hard. Advocacy, fighting for (dis)Able students' rights, is a critical component of accessible education. Universities need to collaborate with (dis)Able students, faculty, and staff in challenging ableist structures and championing the rights of (dis)Able persons, both within and outside the university.

Uniformity does not define (dis)Able students' experiences, yet commonalities do exist as (dis)Able students experience inaccessible campuses, lack of accommodations, and attitudes of faculty and administrators. Understanding the complex weave of individual differences along with common experiences is a vital step toward meeting (dis)Able students' educational needs. Universal instructional design provides a beginning platform for access (Burgstahler & Cory, 2008), but taking it to the next step by creatively working with each student with a (dis)Ability will tailor the accommodations to their specific needs. Networking amongst and between (dis)Able students, creating a safe place where (dis)Able students can come together to support each other in their common struggle, is an important feature of services to (dis)Able students. Universities need to make these spaces available.

### Conclusion

Melissa told her story of journeying through postsecondary education as a woman with a (dis)Ability. While Melissa was certainly an advocate for her rights and those of (dis)Able students, her story was not that unlike other (dis)Able students trying to navigate through postsecondary institutions (Coriale et al., 2012; Dunn et al., 2006, 2008). Highlighted within her story were the trials and tribulations of living with a (dis)Ability while trying to access a university education. Melissa brought awareness of accommodation and inclusion to faculty and administration at the universities she attended. She pushed politicians toward a fuller understanding of the experiences and needs of (dis)Able students and she modeled to other (dis)Able students that postsecondary education was within their reach. Through telling her story in this article, Melissa hopes to raise the consciousness of faculty and administrators at other universities, ultimately broadening the inclusion of (dis)Able students within

postsecondary education globally. Academics, university administrators, and policy makers are challenged to recognize the struggles of students with (dis)Abilities and empower (dis)Able students in the declaration of their own voices while aiding these individuals in achieving their goals.

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# An Initial Investigation into the Role of Stereotype Threat in the Test Performance of College Students with Learning Disabilities

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## Abstract

In a quasi-experimental evaluation of the possible role of stereotype threat in the academic performance of college students with learning disabilities (LD), students with (N = 29) and without (N = 62) identified LD took a simulated Verbal GRE® task in one of two conditions modeled after those used in past stereotype threat (ST) research. The task was presented as either a measure of verbal reasoning and reading abilities (ST condition) or as a measure of problem-solving style (Reduced-Threat condition; [RT]). The traditional ST-related performance differences in accuracy were not found in the sample of undergraduates with LD; however, marginally significant differences in the efficiency with which students with LD completed test items in the RT condition relative to the ST condition suggest the need for follow-up research, given the frequency with which the accommodation of extra time on exams is granted to and is used by undergraduates with LD. Potential limitations due to size and representativeness of the sample are addressed.

*Keywords: Disability stereotypes, test performance, processing speed, ability assessments*

Although school-age children with learning disabilities (LD) have traditionally received far more attention from researchers and policy makers, numerous studies note a dramatic increase in the number of individuals with LD attending college over the past 10 to 15 years (Orr & Hammig, 2009; Sparks & Lovett, 2009a). Reliable incidence figures are difficult to obtain and vary across institutions, but it appears that students with documented LD constitute on average between 2.4 - 3% of full-time freshman undergraduates in the United States (DaDeppo, 2009).

Unfortunately, as is the case for younger students with LD, college students with LD struggle more than their peers. For instance, studies have documented that these students experience more test anxiety (Davis, Nida, Zlomke, & Nebel-Schwalm, 2009; Holzer, Madaus, Bray, & Kehle, 2009) and tend to earn lower grades and fewer honors than undergraduates without

LD (DaDeppo, 2009; Sparks & Lovett, 2009a). Moreover, undergraduates with LD experience prejudice from their peers and even from college professors (Hartman-Hall & Haaga, 2002; May & Stone, 2010; Murray, Wren, & Keys, 2008), which may result in professors failing to accommodate students with LD or students not approaching disability services offices or their professors in the first place. These views may be explicitly or implicitly communicated to the undergraduates with LD themselves (Quinlan, Bates, & Angell, 2012), and thus may be damaging, given the significant impact of teacher perceptions of students with LD in elementary and secondary education (DeSimone & Parmar, 2006).

In contrast to these stereotypes and in accordance with the definition of LD, college students with LD have at least average intelligence (Sparks & Lovett, 2009a). In the case of the more successful subset of

students with LD who have progressed to the postsecondary level and gained admission to highly competitive universities, one could reasonably argue that above-average conceptual and problem-solving skills are necessary in order to compensate for the students' defining skill deficits. With appropriate accommodations, students with LD should therefore be experiencing more success in their undergraduate careers than they presently are. Specifically, recent data suggest that these students take longer to graduate and that they are more likely to transfer to different colleges or to drop out altogether, even as early as their first year (DaDeppo, 2009; Murray, Goldstein, Nourse, & Edgar, 2000; Orr & Hammig, 2009). For instance, Murray et al. (2000) found that undergraduates with LD had a 23% lower graduation rate than their peers without LD. Studies also report undergraduates with LD to earn a grade-point-average (GPA) as much as one-half of a point below their non-disabled peers (DaDeppo, 2009; Zurcher & Bryant, 2001). One might question, therefore, how much of the lower achievement by undergraduates with LD is attributable to their learning disabilities, and how much is a result of external factors such as prejudice and lower expectations for these students.

This account is unfortunately very similar to the case of many students of color at the college level. For example, Osborne (2007) found high-performing African American college students to be particularly susceptible to various measures of test anxiety. Furthermore, Steele (1999) noted that the dropout rate for African American college students is 20 to 25% higher than that for Caucasians, and that those who complete college generally earn a GPA that is two-thirds of a grade point below that of Caucasians. These disparities persist for even middle-class African American students, suggesting that lack of social or economic opportunities is not a sufficient explanation for these students' failures.

### **Stereotype Threat**

In an attempt to explain the disproportionate number of failures experienced by African American undergraduates, Claude Steele, Joshua Aronson, Steven Spencer, their associates, and many other research groups in the last 15 years have provided evidence for a theoretical construct they call "stereotype threat" (Beasley & Fischer, 2012; Ben-Zeev, Fein, & Inzlicht, 2005; Spencer, Steele, & Quinn, 1999; Steele & Aron-

son, 1995; Vick, Seery, Blascovich, & Weisbuch, 2008; Woodcock, Hernandez, Estrada, & Schultz, 2012). Stereotype threat is the performance-diminishing apprehension of fulfilling an applicable, negative, ability-related stereotype in the face of a challenging/frustrating task (Aronson, Quinn, & Spencer, 1998). This means that commonly held prejudices in the United States, such as the view that Caucasian individuals are superior in overall intellect, can cause African Americans to underperform merely out of concern that they may underperform and thus confirm stereotypes. Stereotype threat therefore demonstrates the power that negative stereotypes wield over their targets.

In the undergraduate populations in which it has already been documented, stereotype threat shows a particular pattern of findings. Using the general example of verbal skills in African American and Caucasian undergraduates (based on Steele & Aronson's seminal 1995 study), stereotype threat produces the following interaction: When told that a test modeled after the Verbal Graduate Records Exam ([GRE®]; Educational Testing Service, 2010) measures "verbal ability" (stereotype threat [ST] condition), African Americans perform significantly lower than Caucasians on the test. On the other hand, when told that the same test measures "verbal problem-solving" (reduced-threat [RT] condition), the performances of the African Americans and Caucasians do not differ significantly. Nussbaum and Steele (2007) extended this manipulation to "academic ability" more broadly, characterizing a 20-question anagram measure as "a test designed to be diagnostic of academic ability" (ST condition) or "not a diagnostic test; an activity we use as a warm-up for problem-solving exercises" (RT condition; p. 129). Similar ST manipulations have been used to document stereotype threat in Latino (Woodcock et al., 2012) and low-socioeconomic-status (SES) undergraduates (Croizet & Claire, 1998; Spencer & Castano, 2007). A large meta-analysis has even demonstrated a "latent ability" effect whereby non-Asian ethnic minorities and women in quantitative fields participating in a "safe" (i.e., RT condition) significantly outperform controls in the RT condition (Walton & Spencer, 2009).

Studies of women's undergraduate mathematical performance have also consistently demonstrated the ST effect (i.e., that women perform significantly more poorly than men in the ST condition but the same as, or better than men in the RT condition) using manipulations similar to those used to examine stereotype threat

the already mentioned populations (Ben-Zeev et al., 2005; Carr & Steele, 2009; Good, Aronson, & Harder, 2008; Shih, Pittinsky, & Ambady, 1999; Spencer et al., 1999; Vick et al., 2008). For instance, Carr and Steele (2009) demonstrated stereotype threat in women when a math test was characterized as diagnostic of math/spatial ability and participants had to indicate their gender before taking the test (ST condition) relative to the RT condition, when the test was characterized as a “puzzle-solving exercise” and participants reported their gender after the test. Danaher and Crandall (2008) found that the manipulation of varying the order of asking participants to report gender information in and of itself was sufficient to replicate the ST effect (i.e., reporting gender before was the ST condition; reporting after was the RT condition). In addition, Vick et al. (2008) employed the manipulation for women’s mathematical performance that the test about to be taken had “shown” (ST condition) or “not shown” (RT condition) “gender differences in performance in previous studies” (p. 627).

Even Caucasian males are not immune to stereotype threat. Aronson et al. (1999) demonstrated this by invoking a comparison of Caucasian males’ mathematical performance to that of Asians. Similarly, Beasley and Fischer (2012) found the ST effect in white males majoring in science, technology, engineering, or math by asking questions to raise their race consciousness (e.g., “If I don’t do well people will look down on others like me,” p. 436). Moreover, a number of studies document stereotype threat in white males in non-academic domains. For a review of these studies and the ST literature overall, see Kit, Tuokko, and Mateer (2008).

One significant attribute of stereotype threat is that, in some contexts, it does not have to be explicitly invoked. In other words, if a stereotype-targeted population is told nothing but the standard instructions for a challenging stereotype-relevant test, they perform on the test as if stereotype-threatened (Osborne, 2001; Quinn & Spencer, 2001, Study 1; Spencer et al., 1999). For instance, Quinn and Spencer (2001) found that women performed significantly worse than men on an assessment of mathematical problem-solving when there was no mention of stereotypes or gender; however, there was no gender difference in an RT condition in which participants were told that the test “does not find gender differences.” This finding means that negatively stereotyped students may be experienc-

ing stereotype threat in routine stereotype-relevant academic situations, not just in assessment settings characterized by the marked demand characteristics of the experimental literature. Moreover, studies such as Good et al. (2008) and Walton and Spencer (2009), which find the performance of negatively stereotyped groups to exceed that of groups not negatively stereotyped when in a “safe” testing condition, present the prospect that educators may have set an artificially low ceiling for students vulnerable to stereotype threat in expecting performance only equal to that of non-threatened individuals.

In contrast to the steady stream of studies documenting the ST effect itself, fewer studies have examined the possible mediating variables in stereotype-threatened performance, and these studies have presented somewhat weak and conflicting findings (Kit et al., 2008). Potential mediators and moderators of the ST effect that have received experimental scrutiny include test anxiety, evaluation apprehension, cognitive interference, self-doubt, working memory, arousal, emotional regulation, and perseveration (Kit et al., 2008; Smith, 2004). Physiological measures include blood pressure (Blascovich, Spencer, Quinn, & Steele, 2001; Osborne, 2007) and constriction or dilation of the vasculature (Vick et al., 2008). Moreover, in the case of women taking math tests, neural networks associated with social and emotional processing had more heightened activation in an ST condition relative to women in an RT condition, whose networks associated with math learning were more activated (Krendl, Richeson, Kelley, & Heatherton, 2008).

A schematic representation of the theory behind the ST effect is provided in Figure 1. Included here is an indication of the prerequisite conditions for the operation of the effect (i.e., participant and test conditions), the various hypothesized mediating variables, and the outcomes of the effect. In contrast to self-fulfilling prophecy, which results in the individual’s reduction in effort (Merton, 1948, as cited in Madon, Jussim, & Eccles, 1997), a stereotype-threatened individual is strongly identified with the academic area being evaluated and believes that he or she can be successful, thus working very hard to disprove or “rise above” the relevant, negative stereotype that applies to him or her.

### **Stereotype Threat and Learning Disabilities**

Although the above review of research on stereotype threat is suggestive of the possibility that students

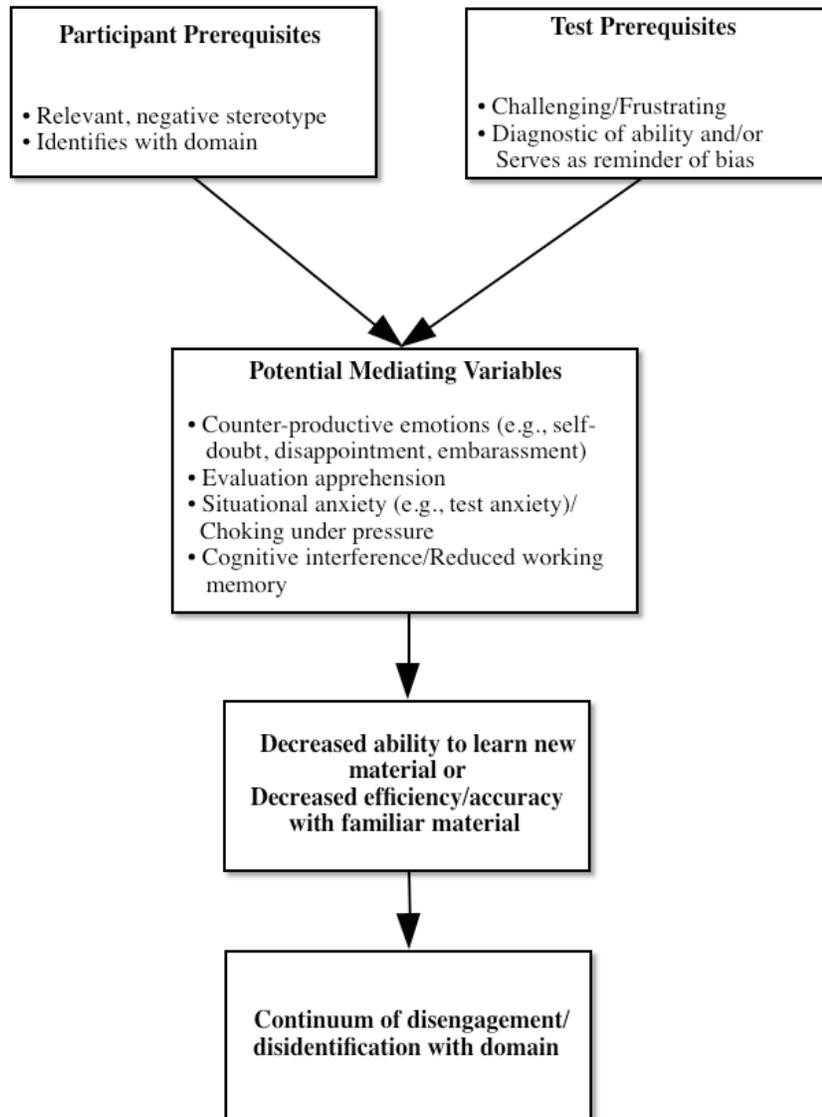


Figure 1. A Working Model of Stereotype Threat

with LD may be prime targets for stereotype threat, no studies have focused specifically on this population. However, like the populations targeted to date in the ST research, students with LD are the object of common stereotypes regarding academic ability, and they have been shown to differ from their peers on several of the factors hypothesized to mediate the ST effect. For example, numerous studies document the key role played by higher levels of test anxiety in these students than in those without LD, especially at the college level (Davis et al., 2009; Holzer et al., 2009;). In addition, memory limitations are a common processing deficit found in students

with LD (Swanson & Saez, 2003), and recent studies have identified working memory as being compromised by stereotype threat (Schmader & Johns, 2003).

A few of the variables that have been investigated in previous ST studies seem particularly relevant to undergraduates with LD. One such factor is cognitive efficiency. In particular, Steele and Aronson (1995) found that African Americans who were administered a test that was purported to be diagnostic of verbal ability spent significantly more time per item than African Americans who were administered one purported to be non-diagnostic of ability, and more time than Cauca-

sians in both conditions. Even though all participants were scored only on those items they completed, stereotype threat had significantly decreased the accuracy of the African American participants as well, meaning that inefficiency due to ST, and not inadequate time per se, had been the source of these students' difficulties. It is noteworthy that a common accommodation for students with LD is extra time, based on the assumption that many of these students have significant deficits in speed of processing. It may be the case, therefore, that stereotype threat, in addition to an intrinsic processing inefficiency, contributes to slower test performance in undergraduates with LD.

Moreover, undergraduates with LD meet the two participant characteristics for susceptibility to stereotype threat elucidated by Aronson et al. (1998). First, they are subject to a number of negative stereotypes that are especially applicable in testing situations, such as that they have lower mental ability (May & Stone, 2010; Shapiro & Margolis, 1988). It is therefore possible that slight modifications of the verbal-ability/verbal-problem-solving manipulation would produce a similar ST effect in undergraduates with LD. Second, most studies of stereotype threat underscore the importance of participants being "identified with" a particular domain in order to be stereotype threatened (Osborne, 2001). That is, they must not only perceive themselves as having skills in a particular domain, but also view those skills as constituting part of their identities (Steele, 1999). Individuals with LD meet this second characteristic as well: Despite years of academic failure, they do not discount the importance of academic performance (Cosden & McNamara, 1997; Elbaum & Vaughn, 2003). Third, some findings indicate that ST effects exist in the presence of invisible social differentiation as well as in the case of visible factors such as gender or race. For example, students with low SES have been shown to evidence ST effects (Croizet & Claire, 1998; Woodcock et al., 2008), as have white undergraduates at Princeton from less common high schools (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010).

In addition, noting that, "Most stereotype threat literature has focused on visible stigmatized status" (p. 142), Kit et al. (2008) summarized ST effects documented in populations with a traumatic brain injury, mental illness, and drug use. They proposed, "Contextual and psychological factors (i.e., negative stereotypes), in addition to organic causes, may be influencing . . . test performance for neuropsychologically

compromised individuals" (p. 141). These findings lend further credence to the possibility that students with LD, another group with invisible differences, may also be affected. Finally, a number of studies are finding that stereotype threat interferes not just with participants' performance on tasks but also with their *learning* of new skills (Appel, Kronberger, & Aronson, 2011; Inzlicht & Ben-Zeev, 2003; Mangels, Good, Whiteman, Maniscalco, & Dweck, 2012; Taylor & Walton, 2011). Building on DeDeppo's (2009) assertion of a need to integrate academic/cognitive and affective/contextual factors in explaining college success for students with LD, the time therefore seems overdue to investigate the possible role of stereotype threat in undergraduates with LD.

Contrary to the situation for most other populations studied within the ST paradigm, however, it is important to note that there are actually intrinsic (i.e., non-stereotype-related) reasons as well as stereotype-related reasons to expect diminished performance. By definition, students with LD exhibit various processing deficits that would be expected to interfere with performance. Thus, this study's hypothesis is that the performance of undergraduates with LD on a disability-relevant task will significantly improve when stereotype threat is lifted (in the RT condition). In contrast to studies of stereotype threat in previous populations, however, the improvement will not result in performance as good as that of the controls in the RT condition because extended time limits will not be provided to undergraduates with LD.

### The Present Study

Despite the preceding indications of the plausible role of ST in the poor performance of participants with LD, this potential role has not been explored. As a result, the primary goal of the present study was to provide a preliminary examination of the role of stereotype threat in the performance of students with LD. Using the same experimental paradigm as most previous studies of ST, students with and without a history of LD classification were assigned randomly to an ST or RT condition for participation in an academic assessment, and their relative performance was assessed. Given the emphasis placed on cognitive efficiency as a possible mediating factor in ST, both accuracy and speed of performance were examined for possible ST effects. To address these issues, we posed the following research questions:

1. Is the ST effect present in undergraduates with LD in a situation tapping academic skills?
2. Is any ST effect evident in speed, accuracy, or both?

## Method

### Participants

The participants for the study included 29 postsecondary students with LD and 62 without LD (hereafter, NLD) ranging from 18 to 24 years (LD:  $M = 20.55$ ;  $SD = 1.64$ ; NLD:  $M = 20.31$ ;  $SD = 1.06$ ). The NLD group and group with LD did not differ significantly in age,  $t(89) = .86, p = .39$ . Undergraduate-level students were chosen because the participants in most previous ST studies have been undergraduates, and thus it seemed prudent to examine the issue in this age group initially. Participants were recruited from two large Midwestern public research-intensive universities (hereafter referred to as University A and B) comparable to those used in past ST research. A total of 33 participants (12 LD; 21 NLD) attended University A, while 58 participants (17 LD; 41 NLD) attended University B. The sample size of students with LD was based on the number of participants in most previous ST studies, which generally had the same number or fewer participants than the present one. We felt it appropriate to treat the data from the two universities as a single sample because University A and B were comparable in undergraduate population (A: 24,493 students; B: 29,301 students), mean high-school GPA (A: 3.7; B: 3.6), and mean English ACT® score (25th - 75th percentile range for A was 26 - 30; for B: 25 - 29; <http://www.usnews.com/usnews/edu/college/coworks.htm>). Moreover, in the present study, the two school samples were not found to differ on ACT® scores,  $t(85) = 0.87, p = .39$ , age,  $t(89) = 0.108, p = .28$ , or number correct on the Verbal GRE® task used in this study,  $t(89) = 1.22, p = .23$ .

Participants were Caucasian males and females. The decision to exclude ethnic minorities but not women as participants was informed by two facts. First, ST has been documented in non-Asian minority students using portions of the Verbal GRE® and other “verbal-ability” tests (Blascovich et al., 2001; Nussbaum & Steele, 2007; Taylor & Walton, 2011). It has also been demonstrated in Asian women on a portion of the Quantitative GRE® (Shih et al., 1999). As a result, including ethnic minorities risked confounding

race-related ST effects with LD-related ST effects. Second, although stereotype threat has been found to affect women taking math tests (Ben-Zeev et al., 2005; Carr & Steele, 2009; Krendl et al., 2008; Mangels et al., 2012), gender effects have not been reported thus far in studies examining verbal skills in Caucasian, non-Asian minority, or low-SES students (Spencer & Castano, 2007; Taylor & Walton, 2011).

University A’s policies and procedures related to students with disabilities list three criteria that must be met in order to be documented as having an LD. A student with LD must (a) come forward with a concern about his/her academic performance, (b) exhibit academic achievement that is significantly below expectation, and (c) demonstrate one or more areas of achievement at least one standard deviation discrepant from his/her overall or Verbal IQ. In addition, the student’s assessment must have been conducted within the past three years.

University B’s disability resource center cites similar criteria. Students seeking services must document a functional limitation that “significantly interfere[s] with...current academic performance.” A significant functional limitation is “usually defined as a discrepancy of more than 2 standard deviations between achievement and IQ.” Like University A, a student’s documentation must also provide justification for requested accommodations and be no older than three years.<sup>1</sup>

At the end of the experiment all participants were asked to indicate which, if any, type of LD they had (see Measures). It was deemed essential to delay this question until the end of the experiment, as explicitly priming students’ thoughts about their LD before the Verbal GRE® task would likely have interfered with the ST manipulation (Carr & Steele, 2009; Danaher & Crandall, 2008). Participants reported a variety of LD. The most common weakness was in the area of reading (21 students), followed by writing (12), language (9), math (4), attention (5), nonverbal (2), and other (3). Most students (17/29) reported their LD to affect mul-

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1 To replicate the previous ST literature, it was necessary to identify students with LD at highly competitive universities. Students who were admitted to these schools and who submitted documentation of learning disabilities tend to match a gifted and LD profile (via the discrepancy model) in which achievement is just below average while intelligence is well above average. However, since what is at issue here is the state of being perceived (by self and others) as belonging to the LD target group, the specific nature of the individual’s profile is not at issue.

multiple areas, with 1 student reporting 4 affected areas, 9 students reporting 3 areas, and 6 students reporting 2 affected areas.

Despite the number of participants reporting weaknesses in reading, students with LD who have made it to the level of competitive schools such as those used in this study were thought to be reading at an adequate level to take the Verbal GRE® task. Indeed, students with LD at competitive institutions may even have fairly high reading scores; however, this would not protect students with LD from ST. Steele (1999) noted that it is awareness of the stereotype and the knowledge that it applies to a group that give stereotype threat its power over targets. Targets do not have to believe the stereotype to be true of themselves and, in fact, they often work very hard to prove that it is not.

Steele's observation provided our rationale for not limiting the sample of students with LD to those with reading-specific LD. Simply the self-knowledge of having any LD means that participants (even if their disability is nonverbal or math-specific in nature) are aware that a common stereotype about the population to which they belong is that they are poor readers and less intelligent. As a result, the sample of students with LD was not limited in terms of type or severity of disability.

## Measures

**Who-Are-You questionnaire.** This questionnaire was developed to provide information regarding participants' level of identification with reading (the to-be-threatened domain). This information was important since high identification with the target domain is a theoretical prerequisite for the ST effect. Issues of confidentiality made it impossible in the present study to survey participants beforehand. Thus, based on studies such as Spencer et al. (1999), Inzlicht and Ben-Zeev (2003), and Carr and Steele (2009), participants responded to a Likert-style question (on a scale from 1 to 7): "It is important to me that I have good reading skills." Based on Spencer et al.'s suggestion, individuals with a rating between 5 to 7 on this question were designated as "highly identified," those with a rating of 3 to 5 were designated as "moderately identified," and those with a rating between 1 and 3 were designated as "weakly identified" with reading.

Because of concern that the reading-identification question might threaten students with LD, we embedded it in a set of non-academic, trait-related questions

(e.g., "It is important to me that I have strong leadership skills"). These nonacademic questions were not analyzed. The Who-Are-You questionnaire was the first measure to which participants responded, and it was purposefully treated as separate from the main experiment. For instance, most participants filled this out while waiting for others in their testing session to arrive.

**Demographic questionnaire.** This questionnaire (see May & Stone, 2010, Appendix A) was created in order to determine the LD status of participants, as well as to determine other possible covariates. For the present study, the covariate deemed most important was English ACT® score (ACT, Inc., 2010). A number of ST studies (Spencer & Castano, 2007; Taylor & Walton, 2011) have used the Verbal SAT® (College Board, 2010) score as a covariate to control for individual differences in verbal ability.

**English ACT®.** Consistent with previous studies of stereotype threat, we collected each participant's self-reported score on the English ACT® or Verbal SAT® to be used as a possible covariate in the main ST analyses. (Since more participants reported taking the ACT® than the SAT®, Verbal SAT® scores were converted to English ACT® scores using tables for ACT®-SAT® concordance, 2010.)

**Verbal GRE® task.** A researcher-created task consisting of sample and discontinued items from the Verbal GRE® was used as the basis for examining effects of the ST manipulation on students' test performance. In addition, the time spent on each of these questions, which was recorded automatically by the software used for administration (see Procedure), was assessed, consistent with many previous ST studies. Many of these studies (Alter et al., 2010; Good et al., 2008; Osborne, 2007; Vick et al., 2008;) used portions of the Verbal or Math GRE® because they deemed these tests to be appropriately challenging to activate stereotype threat in undergraduates. Based on the predominance of reading difficulties in students with LD, as well as an informal survey of several undergraduates about their perceptions of individuals with LD, it was deemed appropriate to use the Verbal GRE® in the present study because more reading-related than math-related stereotypes seemed to exist about students with LD.

The 45-item mock Verbal GRE® contained four types of items: antonyms, reading comprehension, analogies, and sentence-completion. The criteria gov-

erning the proportion of each item type, the standard instructions for the Verbal GRE® sections, and the majority of the items (38) were taken from *GRE®: Practicing to Take the General Test, 9th Edition* (Educational Testing Services, 1998). The remaining seven items were taken from *Cliff's GRE® Preparation Guide* (Bobrow, Orton, & Covino, 1995). Participants were allowed 30 minutes to complete the test. This time limit was deemed appropriate based on previous ST research utilizing the GRE®, which employed time limits between 15 and 30 minutes.

Test items were selected from those answered correctly by 30-60% of students, based on information in the Educational Testing Services (1998) guide. We based this criterion on reports in the ST literature that items were answered correctly by 30-50% of participants. Finally, test length was based on pilot testing, which had revealed that this number of items would allow about half of the participants to finish. (The actual completion rates in the present study were 48% [NLD] and 33% [LD].)

Items were presented one at a time. Five response choices accompanied each item, along with a sixth choice that gave participants the option to "Skip Question." Each section of items was preceded by the standard instructions given by Educational Testing Services (1998). Participants read and were told that their score would be based on only those items they answered, and that they would receive no credit or penalty for items left blank. This information was included for two reasons: First, it represents the standard terminology of the GRE® instructions, and second, emphasizing the scoring criterion for items left blank was intended to alleviate concerns about not finishing that students with LD, in particular, might have had. In addition, Inzlicht and Ben-Zeev (2003) refer to this method of scoring as "consistent with the stereotype threat literature" (p. 800). See the Appendix for the GRE® instructions in the ST and RT conditions in the present study.

**Manipulation check.** Two 6-point Likert-scale questions served as a check of participants' perceptions of the condition to which they were assigned (i.e., a test of ability versus problem-solving). Analyses involving these items allowed us to verify that the results reported below were not an artifact of differential "buy-in" on the part of participants in the various groups. The instructions and questions for the manipulation check were modeled after Steele and Aronson (1995).

## Procedure

**Participant recruitment and selection.** All participants were solicited by email with a message offering only a general explanation of the study's focus. The message indicated that the researcher was "a doctoral student at [another university] studying psychology, and asked if they "would be willing to participate in an experiment. . . [that] would require approximately an hour of [their] time, for which [they] would be paid \$15/20." Participants were further told that they would "take a test and fill out a few questionnaires," and that, "[their] identity would in no way be connected to either [their] performance on the test or [their] questionnaire responses."

We solicited a total of 450 students with LD and 600 NLD students at University A. At University B, we solicited 227 students with LD and 450 NLD students. We solicited NLD students from the rosters of introductory educational psychology courses at each institution. In the case of students with LD, the solicitation came from disability service specialists. A total of 62 NLD students and 29 students with LD participated in the study.

It should be noted that neither the age,  $t(89) = .86$ ,  $p = .39$ , nor the English ACT® scores,  $t(85) = 1.49$ ,  $p = .14$ , of participants with and without LD differed in the present study. See Table 1 for these and other participant characteristics. Although the absence of differences on the ACT® may raise questions as to the existence of LD-NLD between-group differences, this absence of differences is likely attributable to the fact that almost all of the students with LD reported having been granted extra time on the ACT®. Eligibility for time accommodations on the ACT further substantiates the history of LD diagnosis for these students. Consistent with the ACT®'s policy for documentation, students in the LD group would have been required to submit documentation of high-school-approved accommodations to the ACT®. Moreover, it is important to note that the LD group performed significantly worse than the NLD group on the Verbal GRE® measure administered in the present study, for which no accommodations were provided (see Results). The effect size for mean difference in GRE® performance falls in the moderate ( $d = .55$ ) to large (raw number correct,  $d = .70$ ) range.

**Assignment to condition.** Participants were scheduled for testing in small groups in accordance with their availability. Each small group was assigned randomly to either the ST or RT condition. Since the

Table 1

*Comparison of Participants with LD and Controls on Background Characteristics*

Participants	Age			Gender		English ACT® Score		
	Range	Mean	SD	M	F	Range	Mean	SD
LD	18-24	20.55	1.64	7	22	17-35	25.54	3.95
Control	18-23	20.31	1.06	16	46	20-35	26.74	3.28

LD status of participants was not known until after testing was completed, it was not possible to control the exact proportions of LD and NLD students in each condition. At the completion of testing, a total of 17 students with LD and 32 NLD students had participated in the ST condition, while 12 students with LD and 30 NLD students had received the RT condition.

**Task administration.** At both campuses, students were asked to report to a computer lab/room in the School of Education in groups of between 3 and 11 for a single session lasting approximately an hour. The Who-Are-You questionnaire, as well as the Verbal GRE® task, were all presented on a Macintosh G4 computer using SuperLab Pro™ software (Cedrus Corporation, 1998). The ST manipulation was incorporated into the directions for the Verbal GRE®, which students read silently while the experimenter read aloud. The ST manipulation of “verbal ability” versus “verbal problem-solving” (often used with African Americans) was altered to a contrast between “verbal reasoning and reading abilities” versus “stylistic variations in problem-solving.” This is because pilot testing and a companion study (May & Stone, 2010) found students with LD to be negatively stereotyped regarding their intellectual abilities and reading skills.

Participants were given 30 minutes to complete as many of the 45 GRE® items as they could. They then responded to the manipulation check and the demographic questionnaire. Because participants finished at different times, they were debriefed in writing with encouragement to ask questions, voice concerns, and share any suspicion they might have had about what the study was testing. They were paid \$20 (at University A) or \$15 (at University B) for their participation and then dismissed.

**Cross-check of disability status.** After the study was completed at each site, the names of all the students who participated in the study were sent to the disabilities services office so that they could determine the number of students with LD who had participated in the study. This served as a cross-check of the number who self-identified as having a learning disability. To maintain participant confidentiality and because both disability service offices had inadequate staff resources, no names or evaluation information for students were requested, only the number of students with LD appearing on the participant list. At both schools, the number sent by the disabilities specialists matched the number of students who had self-identified at the end of the study.

### Scoring Data in Preparation for Analysis

**Who-Are-You questionnaire.** Based on the identification-with-reading question, 90% of the students with LD would be rated as highly identified, compared to 98% of their NLD peers. This suggests a high level of identification with reading in both samples. In addition, it is notable that 89 of the 91 participants reported having received a “B” or higher in their most recently taken humanities-related course.

**Verbal GRE® Accuracy.** To assess accuracy of performance on the GRE® task, we scored the data in the manner used by Educational Testing Services (1998), Inzlicht and Ben-Zeev (2003), Quinn and Spencer (2001), and Spencer et al. (1999): + 1 point for correct responses, - 1/5 point for incorrect responses. This method of scoring will be referred to as simply, “ETS Score.” Items left blank were therefore not counted as incorrect in this means of scoring, meaning that students with LD, who were less likely to finish

Table 2

*GRE® Performance of Participants with and Without LD*

Scoring Method	Participants with LD		
	All	ST Condition	RT Condition
ETS Score	8.14 (5.06)	7.95 (4.42)	8.42 (6.05)
Time per Item (all except RC)	27.95 (7.04)	29.22 (8.18)	26.16 (4.79)
Scoring Method	Control Participants		
	All	ST Condition	RT Condition
ETS Score	11.03 (4.96)	10.82 (5.70)	11.25 (4.12)
Time per Item (all except RC)	24.43 (4.43)	23.84 (5.21)	25.07 (3.39)

*Note.* Numbers in parentheses are standard deviations. The unit for all three time-per-item measures is seconds. ETS Score = number of correct responses – 1/5 times the number of incorrect responses. ST = stereotype-threat; RT = reduced-threat; RC = reading comprehension.

the GRE® task, would not be penalized beyond not having the opportunity to attempt as many items as students without LD.<sup>2</sup>

**GRE® Time.** Because time spent per item has been found to increase under ST conditions in some studies (Aronson et al., 1999; Carr & Steele, 2009; Steele & Aronson, 1995), it was deemed important to measure this variable, which was recorded by the SuperLab Pro™ (Cedrus Corporation, 1998) software. Since students with LD, in particular, were predicted to take a disproportionately long time on the reading comprehension items, the average time spent per item was calculated in three ways for each student: for all items, for the reading comprehension items only, and for all items except the reading comprehension items (i.e., antonyms, analogies, and sentence completion).

**Data Analyses.** To address the main research questions, performance on the GRE® task as a function of ST condition by undergraduate students with and without LD was analyzed using separate 2 x 2 analyses of variance for accuracy and time spent per item. In addition, in supplemental analyses, level of identification

with reading, English ACT® score, meta-stereotype of learning disabilities, credibility of ST manipulation, entity vs. incremental view of intelligence, and size of testing group, were evaluated for their potential role as covariates.

### Results<sup>3</sup>

#### ST Effect on the Verbal GRE® Task

**Accuracy.** In order to test for a ST effect on the accuracy of GRE® performance, a 2 x 2 ANOVA (participant status by ST manipulation) was performed using the ETS Score.<sup>4</sup> There was a main effect for

<sup>3</sup> It is important to note that preliminary analyses of responses to the manipulation check items (see Methods) did not reveal any significant differences between the two participant groups in the believability of the ST/RT instructions (ST condition: LD 78%; NLD 79%; RT condition: LD: 46% and NLD 40%). In addition, follow-up analyses of the main ST findings indicated that the results reported below remained the same when restricted to those participants in the two groups who reported believing their condition.

<sup>4</sup> English ACT® scores and GRE® scores for the entire sample were significantly correlated,  $r(87) = .33$ ,  $p = .002$ . Thus, the English ACT® score appeared to be an appropriate covariate for analyses involving participants' accuracy on the Verbal GRE®. As a result, ANCOVAs incorporating this variable were used in initial analyses of students' performance. However, the results of these

<sup>2</sup> We also used two other approaches to scoring accuracy: total number of items correct and proportion correct for items attempted. Since the results were comparable, we report only the ETS Score method here.

participant status,  $F(1, 87) = 6.18, p = .015$ , but the ST manipulation effect,  $F(1, 87) < 1, p = .70$ , and the interaction,  $F(1, 87) < 1, p = .98$ , were not significant. (See Table 2.)<sup>5</sup>

**Time per item.** Preliminary analyses of all three approaches to scoring the time-per-item data revealed that students with LD in the RT condition took less time per item than did their counterparts in the ST condition, whereas controls took the same amount of time per item in both conditions, or took *more* time per item in the RT condition. However, an examination of the means for the time-per-item data revealed a high degree of variability. Upon closer examination, it was noted that this high variability was due largely to the reading comprehension items. Since all three ways of scoring the data yielded similar patterns, the average time per item on all items except reading comprehension items was used for this analysis because of its lower variability. In addition, we further reduced variability by removing item response times that were greater than 2.5 standard deviations from the mean for a given participant.

As expected, a main effect was found for participant status,  $F(1, 87) = 7.07, p = .01$ , such that students with LD ( $M = 27.95$  seconds/item) took more time per item than controls ( $M = 24.43$  seconds/item). Also as predicted, there was a marginally significant ST-manipulation  $\times$  participant-status interaction,  $F(1, 87) = 3.11, p = .08$ . Two follow-up  $t$ -tests were then conducted. The results of these tests indicated that students with LD ( $M = 29.22$  seconds/item) spent more time per item than controls ( $M = 23.84$ ) in the ST condition,  $t(47) = -2.81, p = .007$ , but that they worked at essentially the same rate as controls in the RT condition (LD: 26.16; control: 25.07),  $t(40) = -0.83, p = .41$  (see Figure 2).

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analyses were comparable to those found in analyses without the covariate. Because of increased power resulting from the inclusion of subjects with missing ACT scores as well as ease of presentation and interpretation, we report the results without a covariate. We considered five other measures for possible use as covariates: level of identification with reading, credibility of the ST manipulation, entity vs. incremental view of intelligence, meta-stereotype of learning disability, and size of testing group. None of these measures correlated significantly with the GRE® measures, and only credibility of ST manipulation is discussed further.

5 It should be noted that the other two approaches to assessing accuracy of performance also revealed no main effect for threat condition and no interaction.

## Discussion

A central assumption motivating the present study was that ST would be found to hinder the test performance of undergraduates with LD. This assumption was based on the fit between the characteristics of this population and the current working model of stereotype threat (see Figure 1). To date, no other studies have examined the role of ST in undergraduates with LD. This study, although exploratory in nature, expands the limited amount of research on undergraduate students with LD and extends the very small body of research on stereotype threat in populations with invisible differences (e.g., individuals from low-SES or atypical educational backgrounds).

### Presence of Stereotype Threat in Undergraduates with LD

Contrary to expectation, the present study found only marginal support for the hypothesis that ST is a contributor to the diminished performance of undergraduates with LD. As predicted, these students tended to spend more time per test item in the ST condition than in the RT condition. In addition, their time per item in the RT condition did not differ significantly from that of controls in either the RT *or* the ST condition. This pattern of results suggests that students with LD were able to work as efficiently as controls when the burden of ST was lifted. However, the interaction between student status and threat condition was only marginally significant (.08), and the time-per-item differences did not lead to differential accuracy scores for the two groups of participants as a function of the ST condition. Our explanation for this null effect relates to the nature of the GRE® testing procedure, which allows participants to skip items without penalty. Indeed, students with LD skipped more items overall. Given the generous time allotted for the test, this behavior did not impose a significant penalty on those participants. Thus, the overall performance differences in ETS Score between students with and without LD were attributable to differing numbers of items completed, rather than to differential success on items attempted.

Therefore, consistent with numerous studies regarding test performance by students with LD, this study found undergraduates with LD to take significantly longer than their non-LD counterparts on a test, regardless of the testing condition. Moreover, the present study provides suggestive evidence that ST (not

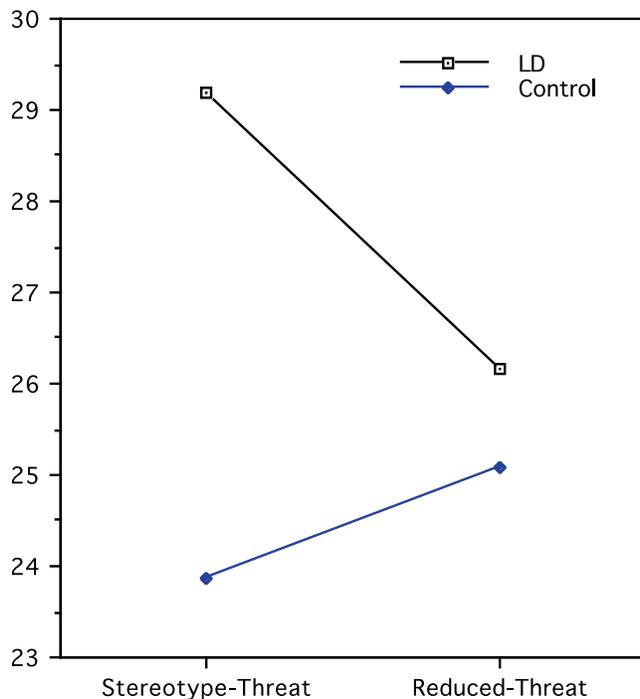


Figure 2. Main Effect and Interaction for Time per Item.

just the processing weaknesses intrinsic to students with LD) may contribute to the slower speed of test performance typically documented in undergraduates with LD. Clearly, more research is needed to validate this possibility, but the present results suggest that such research is a pressing need.

#### A Check for the Prerequisites of Stereotype Threat

As a further means of exploring the likely reasons for the weak findings in the present study regarding the presence of ST in undergraduates with LD, the components of the current ST model were revisited to ensure that all prerequisites had been met (see Figure 1).

One prerequisite for susceptibility to ST is that the individual is identified with the performance domain in question. This prerequisite appears to have been satisfied, in that no participants with LD were observed to report low identification with reading (as measured by their responses on the measure described above).

The second prerequisite for susceptibility to ST is that the test administered should be challenging, “push[ing] ability to the limit” (Aronson et al., 1998, p. 92). For all groups and conditions in the present

study, subjects performed at between 40 to 42% accuracy. This figure is consistent with those reported in many studies reporting significant ST effects (Inzlicht & Ben-Zeev, 2003; Krendl et al., 2008; Shih et al., 1999; Steele & Aronson, 1995) although some report using easier tests (Alter et al., 2010) and others report using harder ones (Osborne, 2007). Nevertheless, the item difficulty and performance of participants in the present study seem appropriate based on the majority of ST literature.

The third prerequisite for susceptibility to ST is that the test administered should purport to measure ability. Based on an examination of responses to the manipulation-check items, the majority of participants did indeed tend to believe that the Verbal GRE® in the present study was a test of their ability in the ST condition. Re-running the analyses on those students who reported believing the ST and RT instructions produced the same findings as when these analyses were performed for all participants. Failure to satisfy the ability prerequisite therefore does not therefore seem to be a likely explanation for the negative findings.

The fourth prerequisite is that there exists a rel-

evant, negative stereotype about individuals with LD. Certainly negative stereotypes have been documented in some previous studies focused on individuals with LD (Houck, Asselin, Troutman, & Arrington, 1992; Shapiro & Margolis, 1988), as well as in a companion study by the authors (May & Stone, 2010) using a larger sample that included the participants in the present study. In that study, 112 of the 138 participants (about 81%) reported meta-stereotypes of individuals with LD that were negative (see May & Stone, 2010, for details).

It is noteworthy that the specific type of intellectual deficiency reported by participants in the companion study (May & Stone, 2010) was less often related explicitly to reading and/or verbal abilities, suggesting possible ambiguity regarding potential threat situations. Also, 47% of the individuals with LD reported a meta-stereotype of LD that did not relate explicitly to intelligence. Because an individual's assumptions regarding the stereotype that others hold about his/her group moderates his/her susceptibility to ST (Hamilton & Sherman, 1994), the heterogeneous, non-intelligence related meta-stereotypes of LD that some undergraduates with LD held may have weakened any influence of the ST manipulation.

Thus, only three of the four prerequisites for activating ST appear to have been fully satisfied in the present study: that all participants were adequately identified with reading LD, that the test administered was challenging, and that the test was believed to be an assessment of ability. The remaining prerequisite, that a negative, ability-related stereotype about students with LD existed in the present sample, appears to have been only partially met. Therefore, the findings related to this prerequisite deserve future exploration as an alternate explanation for the pattern of findings in the present study.

### **Alternate Explanations and Implications of the Findings**

In the present section, two possible explanations for the failure to find the typical performance decrements associated with ST are discussed: limitations in statistical power, and the representativeness of the sample with LD who participated in the present study.

**Power Limitations.** One alternative explanation for the mixed findings regarding ST is that the GRE® task used in the present study was not sufficiently sensitive (at least not in the 30-minute time limit employed here) to detect the subtle performance differences between the ST and RT conditions that were

originally predicted. In addition, there may have been an insufficient number of participants (especially those with LD) to document this effect. With regard to this first concern, it is noteworthy that most previous researchers who administered graduate-level tests (see Introduction) instituted time limits ranging from 15 to 30 minutes.

In order to evaluate the speculation that there may have been an insufficient number of participants with LD in the present study, it was necessary to calculate effect sizes for previous ST studies and to apply these to the present study. For instance, using Cohen's (1988) power tables and estimating the means and standard deviations using a graph in Steele and Aronson (1995), it was determined that Steele and Aronson's effect size for detecting the simple main effect (of African Americans in the RT condition performing significantly better than in the ST condition) was .54. Data from Spencer et al.'s (1999) study of women's mathematical performance yielded fairly comparable effect sizes (i.e., a main effect size of .65 and an interaction effect size of .47). Using the more conservative effect sizes from Steele and Aronson's (1995) study to calculate the present study's power to detect the simple main effect (that students with LD would perform significantly better in the RT than the ST condition) yielded a power of .99. Thus, the power to demonstrate the hypothesized effects in the present design appears high.

**The representativeness of the LD sample.** A second possible explanation for this study's failure to find the ST effect for students with LD may relate to the participant recruitment process. Because of Institutional Review Board guidelines, the solicitation email sent to students made specific reference to the fact that students would take a "short test." It is therefore possible that those students with LD who were most likely to feel threatened by the prospect of taking a test would not respond to the participant-solicitation email in the first place. Additional evidence that the group of participants with LD in the present study may have been less threatened by the prospect of taking a test is that these students did not differ significantly from controls in their level of state test anxiety (unpublished data). This finding is in stark contrast to those in a number of other studies of test anxiety, in which undergraduates with LD demonstrated significantly higher levels of test anxiety (Holzer et al., 2009; Hoy et al., 1997).

It should also be noted that the reliance on a discrepancy model of LD by the institutions from whom

we drew participants is another potential source of bias in the study. As noted by Sparks and Lovett (2009b), discrepancy models are widely used in the eligibility decisions of postsecondary institutions. The data reported by Sparks and Lovett indicate that the individuals identified by such a method overlap only partially with those identified by other methods such as low achievement. As noted in the earlier discussion of participant selection (see Methods), the ST framework assumes that individuals who identify with a threatened population are susceptible to the relevant ST regardless of their actual characteristics. Thus, the participants' achievement status should not be a deciding factor in their susceptibility to ST if indeed the phenomenon exists in the LD population. Nonetheless, the existence of stereotype threat should be explored in individuals who fit the classic low-achievement pattern as well as in high-functioning individuals with LD such as those in the current sample.

### Directions for Future Research

The findings from this study represent an important starting point in the analysis of the role of ST in the LD population; however, they need to be replicated and expanded. In particular, we suggest several design issues to consider in future studies.

One primary limitation of the present study is the low number of participants with LD as well as the inherent self-selection bias involved in limiting the study to students with LD who have registered with their institution's disability services office. Addressing this issue in future studies is important; however, there are challenges in doing so. College students with LD represent a small, albeit growing population (Orr & Hammig, 2009; Sparks & Lovett, 2009a). In addition, it would be expected that, if ST does indeed impact students with LD, the potential study population would be limited further by the fact that few such students would want to participate in a study that would arouse the degree of discomfort typically associated with ST. One possible approach to addressing this issue would involve accessing potential participants via the graduation records of high school special education departments.

Two additional possibilities for modifying the ST manipulation are to use an identity-priming manipulation or a test-bias manipulation instead of the task-reframing manipulation used in the present study. For instance, Vick et al. (2008) used the ST manipulation of telling female participants in their study that the

challenging math test they were about to take had shown gender differences in performance in previous studies. Such a manipulation could easily be reworded to read, "This test has previously shown/not shown performance differences between students with and without LD." Along similar lines, an ST manipulation similar to the one used by Danaher and Crandall (2008) could be modified and used with participants with LD. Specifically, they demonstrated the ST effect by simply asking or not asking female participants to self-identify their gender before taking the Quantitative GRE®, and this could easily be modified by asking students to self-identify their LD status before taking the Verbal GRE®.

### Implications for Practice

This study extends the current body of research supporting the accommodation of providing extra time to students with LD (Alster, 1997; Lindstrom & Gregg, 2007). Specifically, our study found that students with LD tended to spend significantly more time per item than controls in the ST condition, and the reader will recall that the typical test administered at the college level is assumed by default to be one of ability (and therefore akin to an ST condition) by the students who take it (see earlier discussion of work by Spencer et al., 1999). Because ST is by default in the "on" position in undergraduate tests and because many students, even those with invisible differences, appear vulnerable to negative stereotypes regarding their performance, research on the test performance of all students should be undertaken to determine how factors such as ST may cause educators to underestimate the academic performance of many.

### Conclusions

Based on the results of this study, the role of ST in the test performance of college students with LD remains uncertain. Although there was no decrement in the overall number of items answered correctly, it is nonetheless noteworthy that students with LD tended to spend more time per item and to skip more items. This finding suggests that reducing the amount of ST in a testing situation for students with LD might result in performance that is no less accurate but more efficient than typical testing situations and might lead to less emotional discomfort and/or distraction.

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## Authors' Note

This study was made possible with the generous support of a Donald D. Hammill Foundation Research Scholarship, a Northwestern University Dissertation-Year Fellowship, and a Northwestern University Graduate Research Grant.

## Appendix

### Key Stereotype-Threat (ST) and Reduced-Threat (RT) Instructions from the Verbal GRE® Task Procedure

(Note: The wording differences between the two conditions are bracketed and underlined, and instructions were read aloud by the experimenter while participants read them silently.)

This study is concerned with [ST: various personal factors involved in performance on problems requiring verbal reasoning and reading abilities] [RT: stylistic variations in problem-solving]. The items on the test you are about to take are similar in format to the Verbal SAT®. ...

The test you are about to take is . . . especially difficult because [ST: we are interested in analyzing your abilities and limitations in reading and verbal domains so that we might better understand the factors involved] [RT: of our research focus on challenging reading tasks]. This test has previously been found valid for a wide range of populations including Caucasians and minorities, men and women, and individuals with and without learning disabilities, to name a few. Please provide strong effort in order to help us in our analysis of this problem-solving process. [RT: You will note that this test is different from almost all other tests that you have taken because we are not interested in analyzing ability: as was earlier mentioned, we are examining stylistic variations in problem-solving.] This test may also be helpful to you by familiarizing you with [ST: some of your strengths and weaknesses in reading and in verbal domains] [RT: the kinds of problems that appear on tests you may encounter in the future]. ...

You will have 30 minutes to work on this test, which consists of 45 questions. ... Questions left blank (because you felt unsure of the answer or because you ran out of time) will receive no credit or penalty: your score is based on only those questions you answer. It will, however, generally benefit you to guess if you are able to narrow a question down to two possible responses.

## BOOK REVIEW

**Susan E. Longtin**  
**Brooklyn College**

Perner, L. (Ed.). (2012). *Scholars with autism achieving dreams*. Sedona, AZ: Auricle Books. 182 pages; \$26.95, hard cover; \$19.95, paperback.

This edited volume focuses on the first person narratives of eight individuals, three males and five females, with high functioning autism (HFA)/Asperger syndrome (AS), who have succeeded in higher education. The eight contributors have each earned advanced degrees, two masters and six doctorates, in a variety of fields. In terms of organization, the book begins with the biographical sketches of the eight scholars who contributed the essays: Dawn Prince, Stephen Shore, Liane Holliday Willey, Valerie Paradiz, Nick Walker, Dena Glassner, Lars Perner, and Temple Grandin. That section also includes the biographical sketch of Darold Treffert, who provides the book's Introduction. The eight personal accounts by the individuals with HFA/AS follow, each forming a different chapter that is as distinct as the essays themselves. The book also includes a glossary and an index.

The biographical sketches designate the highest degree of the contributors (e.g., Dena Gassner, LSMW; Stephen Shore, Ed.D.) and describe their often-complex personal trajectories and notable accomplishments. For example, "after struggling with undiagnosed Asperger's Syndrome until age thirty-five, Dawn [Prince], went from being a homeless teenager with no direction to eventually studying primates and earning her Ph.D. in interdisciplinary anthropology" (p. vi). Several of the contributors have published extensively in their areas of expertise (e.g., Valerie Paradiz, Dawn Prince, and Temple Grandin) or worked in creative venues such as film (e.g., Nick Walker) or other media outlets (e.g., Dena Glassner, Liane Holliday Willey). Five of the eight contributors have authored their own full-length memoirs (e.g., Temple Grandin, Valerie Paradiz, Dawn Prince, Steven Shore, and Liane Holliday Willey). All are self-identified autism advocates who serve on various advisory boards of major autism organizations throughout the United States.

Darold Treffert, a psychiatrist with extensive clinical experience with autism and expertise in savant syndrome, writes the Introduction. This piece is entitled, "Oval Souls on a Round Planet." In it he notes that these individuals on the autism spectrum initially tried to be just like everyone else rather than be themselves. He points out that the growing up years were particularly difficult for most of these scholars, given misunderstandings about their condition. Many were ridiculed and bullied by their peers especially during their high schools years when being different can be painful. However, as Dr. Treffert notes, in each instance, a loving parent, special teacher, reassuring friend, or supportive colleague accepted them as they were. Consequently, these individuals eventually thrived in higher education, found their niche, capitalized on their strengths, and achieved success and contentment in their professional and personal lives. This Introduction sets the tone for the strength-based perspective of the book, which emphasizes being "differently abled" rather than "disabled" (p.1).

This focus on individual differences rather than disabilities recurs in several of the essays. For example, Dawn Prince notes that "our collective story is beautiful, if twisted. We are not disabled. We are everything. We are beyond description" (p. 28). Similarly, Liane Holliday Willey claims that "cures, problems, disabilities, weaknesses—these are words that bind anyone to inertia. Respect and mutual appreciation for individuality—these are words that honor humanity" (p. 70). This emphasis on difference is an important reminder for those of us who work in disabilities services or allied fields that a deficit perspective is often detrimental to those we wish to serve.

The essays in the book underscore the heterogeneity of this growing population. For example, Lars Perner, the book's editor and an essay contributor, has degrees in business and psychology as well as exten-

sive professional experience in marketing. Another contributor, Nick Walker, who studied somatic psychology, has a back belt in aikido and engages in mind/body practices such as yoga and meditation. Temple Grandin, perhaps the best-known contributor to the book, studied animal science, conducts research, and teaches in the areas of livestock handling and facility design. Her essay features practical advice to those on the spectrum, their families, and professionals by noting that “it is important to nurture talents that can lead to careers and enjoyable hobbies” (p. 160). Stephen Shore’s contribution also provides practical advice for the students who must navigate the college system. He directs them to “find the disabilities office, find out what documentation is necessary to obtain accommodations, and how recent that documentation must be. It’s also good to come to the disabilities office with suggestions for reasonable accommodations” (p. 39).

In terms of common themes, all of the contributors emphasize their differences, resilience, accomplishments, and strengths. For example, Nick Walker claims that his:

...successes, like those of many autistic people who have found good niches for themselves in the academic and professional world, have to some degree been built on the fact that having a mind that works very differently from most other peoples’ minds gives them a unique perspective. (p. 39)

He goes on to observe that such perspectives allow them “to spot details or patterns of possibilities that others might overlook and to come up with innovative approaches others might not think of” (p. 95). Walker sees his difference as an asset rather than a liability.

The essays of the eight scholars with HFA/AS that comprise the main part of the book are as unique as the individuals who wrote them. The writing styles and tone of the essays vary notably across the eight chapters as a function of the different contributors, as expected. Despite these variations in linguistic form, the essays reflect the shared themes of individuality, resilience, strength, and pride in one’s accomplishments. Each of the chapters of this book can be enjoyed individually or, alternatively, the book can be read as a whole.

Following the eight essays, the book includes a brief glossary of terms (pp. 171-172) that professionals in disabilities services or allied fields should know. These include general terms such as “comorbid condi-

tion” and “Individual with Disabilities Education Act,” which would be part of their vernacular. Other terms are more autism related, such as “Asperger Syndrome” and “hidden curriculum.” The glossary also includes some colloquial items used in the autism culture such as “Aspie,” “neurotypical,” and “stim.” While the glossary is a welcomed addition to the personal accounts, it could have been more extensive, for example, by including the term “savant syndrome” used in the Introduction. The extensive Index at the end of the book (pp. 173-182) will be particularly helpful to the reader who wishes to locate information about specific topics (e.g., central coherence), organizations (e.g., GRASP), or persons (e.g., Jean Ayres) discussed in any of the chapters.

This book is a must read for individuals on the spectrum who attend or hope to attend college or graduate school. These stories should inspire “optimism and hope” (p. 1) in such individuals and their families. The book is also strongly recommended for members of high school transition teams for students with autism who are considering college, disabilities services officers, professors, administrators, career counselors, and clinical service providers in postsecondary settings. The book could also be used as a supplemental reading in teacher preparation programs or clinical fields. *Scholars with Autism Achieving Dreams* will enrich its readers with important knowledge about this growing population from this fine collection of personal accounts.

## About the Author

Susan E. Longtin received her BA and MA degrees in speech-language pathology and audiology from Hunter College and PhD from the Graduate School of the City University of New York. She is a state licensed, nationally certified speech-language pathologist with experience working in school settings and supervising graduate student clinicians in university clinics. She is currently assistant professor in the Department of Speech Communication Arts and Sciences at Brooklyn College of the City University of New York and co-director of the Advanced Certificate Program in Autism Spectrum Disorders at the college. Her research interests include parent-professional partnerships, mindfulness-based interventions, and the first person narratives of adults with autism spectrum disorders. She can be reached by email at: [slongtin@brooklyn.cuny.edu](mailto:slongtin@brooklyn.cuny.edu)

# Journal of Postsecondary Education and Disability

## Author Guidelines

The *Journal of Postsecondary Education and Disability* welcomes submissions of innovative and scholarly manuscripts relevant to the issues and practices of educating students with disabilities in postsecondary educational programs. Manuscripts must be submitted electronically via email to [jped@ahead.org](mailto:jped@ahead.org)

### Guidelines for authors:

#### Content

Manuscripts should demonstrate scholarly excellence in at least one of the following categories:

- Research: Reports original quantitative, qualitative, or mixed-method research
- Integration: Integrates research of others in a meaningful way; compares or contrasts theories; critiques results; and/or provides context for future exploration.
- Innovation: Proposes innovation of theory, approach, or process of service delivery based on reviews of the literature and research
- Policy Analysis: Provides analysis, critique and implications of public policy, statutes, regulation, and litigation.

#### Format

All manuscripts must be prepared according to APA format as described in *The Publication Manual* (6<sup>th</sup> ed.), American Psychological Association, 2010. For responses to frequently asked questions about APA style, consult the APA web site at <http://www.apastyle.org/faqs.html>

- Manuscript length typically ranges between 25 and 35 pages including figures, tables, and references. Exceptions may be made depending upon topic and content.
- Include 3-5 keywords.
- Write sentences using active voice.
- Authors should use terminology that emphasizes the individual first and the disability second (see pages 71-76 of the APA Manual). Authors should also avoid the use of sexist language and the generic masculine pronoun.
- Manuscripts should have a title page that provides the names and affiliations of all authors and the address of the principal author.
- Include an abstract that does not exceed 250 words. Abstracts must be double spaced on a separate page of the manuscript, between the cover page and the first page of the body of the manuscript. List 3-5 key terms immediately beneath the text of the abstract.
- Provide a cover letter asking that the manuscript be reviewed for publication consideration and that it has not been published or is being reviewed for publication elsewhere.
- Tables and figures must conform to APA standards, and must be in black and white only. All tables and figures should be vertical and fit on the page, no landscape format.

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- Title Page
- Abstract
- Summary of Relevant Literature
- Depiction of the Problem
- Participant Demographics and Institutional Partners/Resources
- Description of Practice
- Evaluation of observed outcomes
- Implications and Portability
- References

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