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**EFFECTS OF EXTENDED TIME ACCOMODATION FOR THOSE WITH
ADHD**

by

Jacqueline Gardner

A Thesis

Submitted to the
Department of Psychology
College of Science and Mathematics
In partial fulfillment of the requirement
For the degree of
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at
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Thesis Chair: Roberta Dihoff, Ph.D.

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Abstract

Jacqueline Gardner

EFFECTS OF EXTENDED TIME ACCOMODATIONS FOR THOSE WITH ADHD

2015-2016

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Masters of Arts in School Psychology

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders of childhood. There is a great deal of published literature that supports the effect of interventions for students at the elementary and secondary levels, however there is limited research that analyzes interventions for college students with ADHD. The purpose of this study is to evaluate the effectiveness of extended time accommodations for college students with and without ADHD. It was hypothesized that students with ADHD would perform better when given extended time to complete assignments. A mixed ANOVA used to investigate the differences in test scores of those with and without a self-diagnosis of ADHD under separate testing conditions was found to be non-significant. Future studies involving a sufficient number of participants with a more accurate diagnosis of ADHD are expected to lead to more effective accommodations for students living with ADHD.

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Chapter I

Introduction

The purpose of this study was to evaluate the effectiveness of extended time accommodations for college students with and without Attention Deficit Hyperactivity Disorder. A growing number of students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) are enrolling in post-secondary educational settings (Baverstock & Finlay, 2003; Brinkerhoff, McGuire, & Shaw 2002; Quinn, Ratey, & Maitland, 2001; Turnock, 1998). One to four percent of post-secondary students have a documented diagnosis of ADHD and may experience a difficult transition into higher education (DuPaul, Schaughency, Weyandt, Tripp, Kiesner, Ota, et al., 2001).

Attention Deficit Hyperactivity Disorder is a chronic neurologically based disorder whereby individuals exhibit developmentally inappropriate behaviors and levels of hyperactivity, impulsivity and inattention. According to Oliver and Steenkamp, ADHD is characterized by a pattern of behaviors that appear in childhood and is more common in boys than girls, with boys outnumbering girls at a two to one ratio (2004). An estimated 17 million people in the United States have Attention Deficit Hyperactivity Disorder (Wallace, Winsler, & NeSmith, 1999).

Attention Deficit Hyperactivity Disorder affects 3-5% of elementary children (Barkley, 1990) with a co-morbidity rate of 20-30% also having a learning disability (DuPaul & Eckert, 1998). In addition 50 to 65% of children diagnosed with ADHD have symptoms that persist beyond childhood (Barkley 1998). ADHD was once considered a childhood disorder but is now recognized as continuing into adolescence and later into

adulthood. It was commonly believed that children would outgrow the symptoms of ADHD as they grew older. However, two to six percent of the adult population is diagnosed with ADHD (Weiss & Murray, 2003).

Attention Deficit Hyperactivity Disorder is a deficit in behavioral execution, often referred to as executive functioning (Barkley 2001). Brown states that executive functions “manage the brain’s cognitive functions; they provide the mechanism for self-regulation” (2006). Due to the deficit of executive functioning, Attention Deficit Hyperactivity Disorder typically manifests in a decreased ability to organize and plan, lowers inhibitory control, and causes erratic attention levels (Pennington, 1991). These limitations often affect individuals with ADHD academically in a variety of ways including producing work of low quality, completing work at a lower rate than their peers, difficulty staying on-task, and following through.

While a great deal of research has been conducted on how to effectively address the behavioral difficulties of children with ADHD in school there is less evidence for effective academic interventions for children with ADHD. Surveys have shown that 78% of non-ADHD individuals graduate from high school and enter college. In comparison, only 25% of students diagnosed with ADHD graduate from high school (Mannuzza, Klein, Bessler, & Malloy, 1993) and 22% of those enter college, with a graduation rate of only 11% (Farone and Biederman, 2005). To put this in more concrete terms, if 100 individuals with ADHD start high school only 25 will graduate. Of the 25 that graduate, only about 5 of those students will attend college and of that 5, only one will graduate.

In postsecondary settings testing accommodations aim address the academic difficulties that are believed to be related to the ADHD. These accommodations may include altering the test presentation, the response format, the time boundaries, or the test setting (Elliot, et al., 2002). Specific accommodations include, among others, extended time, testing in a distraction-free environment, and oral test presentation (Elliott et al., 2002). However, it remains unclear whether these accommodations are effective and for whom.

The purpose of this study was to investigate whether extended time affects test scores for college students with ADHD. In doing so, we analyzed the empirical research on academic interventions and accommodations for post-secondary students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). We intend to determine if extended time accommodations are beneficial for those with Attention Deficit Hyperactivity Disorder (ADHD). We hypothesized that test scores for those with ADHD will improve when given extra time accommodations.

Chapter II

Literature Review

Attention Deficit Hyperactivity Disorder, also known as ADHD, is one of the most common neurodevelopmental disorders of childhood. ADHD is commonly diagnosed during childhood, however ADHD often persists into adulthood. It is normal for children to often have trouble focusing and behaving at one time or another. However those with ADHD do not just outgrow these behaviors (Division of Human Development and Disability, National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention, 2015). Those with ADHD are often diagnosed during childhood. However, teachers, parents, and physicians may not recognize the signs and symptoms of ADHD, thus leading to a diagnosis as a young adult (American Academy of Child and Adolescent Psychiatry, 2013).

Doctors and mental health professionals use a handbook called, the Diagnostic Statistical Manual of Mental Disorders, Fifth Edition, (DSM-5), when making a diagnosis of ADHD:

“Diagnostic and Statistical Manual of Mental Disorders (DSM) is the standard classification of mental disorders used by mental health professionals in the United States and contains a listing of diagnostic criteria for every psychiatric disorder recognized by the U.S. healthcare system. The previous edition, DSM-IV-TR, has been used by professionals in a wide array of contexts, including psychiatrists and other physicians, psychologists, social workers, nurses, occupational and rehabilitation therapists, and counselors, as well as by clinicians and researchers of many different orientations (e.g., biological, psychodynamic,

cognitive, behavioral, interpersonal, family/systems). DSM is used in both clinical settings (inpatient, outpatient, partial hospital, consultation-liaison, clinic, private practice, and primary care) as well as with community populations. In addition to supplying detailed descriptions of diagnostic criteria, DSM is also a necessary tool for collecting and communicating accurate public health statistics about the diagnosis of psychiatric disorders.” (American Psychiatric Association, 2013).

According to the DSM-V, to be diagnosed with ADHD symptoms must be present in multiple settings such as in school and at home. ADHD behaviors and symptoms will often cause deficits in academic, work, and social situations. According to the DSM-V, there are two categories of ADHD, inattention and hyperactivity/impulsivity. These categories include behaviors such as “failure to pay close attention to details, difficulty organizing tasks and activities, excessive talking, fidgeting, or an inability to remain seated in appropriate situations.” (American Psychiatric Association, 2013).

ADHD in College Settings

“In North American college students, the reported prevalence of self-reported, clinically significant levels of ADHD ranges from 2% to 8%” (Nugent & Smart, 2014). Analysis of students with ADHD in American universities showed that the symptoms in this population conform to the bi-dimensional structure of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) criteria (ie, inattention and hyperactivity-impulsivity) (DuPaul, Schaughency, Weyandt, 2001). However, studies indicate that college students are more commonly diagnosed with symptoms of inattention rather than hyperactivity-impulsivity (Advokat, Lane, & Luo, 2011).

The symptoms of inattention, hyperactivity, and impulsivity, and the associated impairments in functioning, have clear negative effects on students in postsecondary education. Symptoms of inattention are of particular concern, having been shown to have a substantial negative impact on college adjustment and academic performance. The transition from adolescence to adulthood is a period of important neurobiological change; in particular, the neurological bases for executive functioning are still being developed. The pathways underlying long-term motivation may also continue to develop throughout this period of emerging adulthood (Nugent & Smart, 2014).

The environment and timing of postsecondary education can be particularly challenging for individuals with ADHD. This is a time in life that brings dramatic changes in lifestyle, independence, and responsibility. As students enter college, they must often cope with the sudden loss of parental supervision and structure, combined with a sudden increase in independence in areas such as academic work, social activity, financial self-management, substance use and daily structure. These changes result in increased demand for organizational skills and long-term planning, while simultaneously providing the opportunity for distraction through the increased availability of immediate, short-term rewards. Coping with the increased demands and distractions of college life can be difficult for individuals without ADHD, but for students with ADHD, whose executive functioning and motivational systems are compromised, the challenges presented by the college environment may be far higher (Fleming & McMahon, 2012).

School accommodations for ADHD. In a comprehensive review of the literature on school-related problems for students with ADHD, Raggi and Chronis documented that

students with ADHD experience difficulties such as off-task and disruptive classroom behavior, negative interactions with peers and adults, academic underachievement, decreased work productivity, lack of study skills, homework incompleteness, and difficulty with various executive functioning processes (2006). While a great deal of research has been conducted on how to effectively address the behavioral difficulties of children with ADHD in school there is less evidence for effective academic interventions for children with ADHD.

Children and youth with attention deficit hyperactivity disorder (ADHD) often have serious problems in school. Inattention, impulsiveness, hyperactivity, disorganization, and other difficulties can lead to unfinished assignments, careless errors, and behavior which is disruptive to one's self and others. Through the implementation of relatively simple and straightforward accommodations to the classroom environment or teaching style, teachers can adapt to the strengths and weaknesses of students with ADHD. Small changes in how a teacher approaches the student with ADHD or in what the teacher expects can turn a losing year into a winning one for the child. However, when it comes to a post-secondary setting various challenges arise.

Individuals with ADHD are less able to redirect their attention back to a relevant task once their attention is diverted and are less able to sustain that attention (Barkley, 1999; Barkley, 2008) Researchers question what types of testing accommodations are appropriate for students with specific disabilities. In postsecondary settings, testing accommodations for students with ADHD aim to address the academic problems that are believed to be related to the disorder. These accommodations may include altering the test presentation, the response format, the time boundaries, or the test setting (Elliot, et

al., 2002).

Extended time accommodations. Schnoes, Reid, Wagner, and Marder found that extended time was the most frequent accommodation provided to a sample of students with ADHD classified as having a disability; 80.9% received additional time on tests and 71.1% received additional time on assignments (2006). Some researchers have noted that students with disabilities may not be able to fully demonstrate their academic abilities under timed conditions. Many other researchers have found that students with disabilities do not differentially benefit from receiving extended time compared with students without disabilities. According to the *Standards for Educational and Psychological Testing* the goal of an accommodation is “to minimize the impact of the test-taker attributes that are not relevant to the construct that is the primary focus of the assessment” (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, 1999). The extra time is intended to compensate test-takers with specific time-related disabilities for their particular type of disability.

Wadley & Liljequist looked at whether a specific testing accommodation (extended time) affects test scores for college students with and without ADHD. The results of this study indicated that math test performance did not differ significantly across the test conditions, regardless of the students’ diagnostic status. Therefore, telling students they were receiving extended or standard administration test time did not affect student test scores (Wadley & Liljequist, 2013). On average, students with ADHD used 26.44 minutes to complete the test, well under the offered 45 minutes, whereas students without ADHD used an average of 22.45 minutes. Therefore, although students with

ADHD, on average, used more time to complete the test than students without ADHD, neither group took full advantage of the time offered (Wadley & Liljequist, 2013).

However, there are limitations to every study. It is possible that the students with ADHD may have benefited from being in a private testing room.

Obtaining accommodations. The student's ability to advocate for himself is important at the college level. Some students, and their parents, are familiar with the Individuals with Disabilities Education Act (IDEA), which may have governed how their elementary or high school handled their needs. However, this act does not apply beyond secondary education. At the college level, two laws affect legal rights and requirements. The Americans with Disabilities Act of 1990 applies to every public and private institution except those affiliated with religious organizations. The Rehabilitation Act of 1973 applies to any entity that accepts federal financial assistance for any program or service. Both laws were enacted to prevent discrimination against individuals with disabilities. Colleges are legally bound to provide necessary accommodations for students who need them, but colleges also recognize that helping students who need accommodations will benefit not only the student, but the institution as well. Possibly because of the success of IDEA in public secondary schools, more and more students with needs are attending college. In 1998, that number was reported as possibly 1 in 11 freshmen attending college. According to the National Center for Education Statistics, in 1999, over 428,000 students needing accommodations were attending 3,630 (72%) of the nation's two- or four-year colleges.

In order to qualify to receive accommodations under the ADA, a student will need to document a qualifying condition. Most schools will have a designated person, a

Disabilities Officer or Disabilities Counselor, who is the point person for determining what a reasonable need is and how it will be handled. The law protects anyone who has a “physical or mental impairment that substantially limits one or more major life activities.” This covers physical, sensory and health-related disabilities, psychological disorders or attention disorders, and some learning disabilities, anything that might prevent the student from participating fully in the life of the campus community (Ranseen & Parks, 2005).

The student must provide a record of impairment in order to meet eligibility requirements for receipt of services. The student is responsible for reporting and supplying any documentation required to verify a need. The college may require documentation of a previous Educational Plan or may require testing. Although it is the responsibility of the college to make or allow necessary accommodations to qualified students, it is the student’s responsibility to request accommodations and to provide needed documentation. According to the Americans with Disabilities Act (ADA), the accommodations allow the individual with physical or psychological conditions to demonstrate his or her ability and knowledge without the hindrance of the disability (Ranseen & Parks, 2005).

Disability Services. The majority of students who request test accommodation seek extra time to improve their deficits in reading speed and comprehension, their capacity for written language, and their ability to sustain attention. Mental health practitioners conducting diagnostic evaluations to document a student's learning problems likely advocate for their clients, arguing that learning impairment requires alteration of

standard exam conditions to ensure that students can achieve optimal results (Ranseen & Parks, 2005).

The effects of ADHD on college students, including impairment of academic performance, an increased likelihood of drug and alcohol problems, and early termination of their studies, underpin the need to identify affected individuals and support them in the management of their disorder to improve their chances of a successful academic career. A diagnosis of ADHD alone is not usually sufficient to qualify for academic accommodations, and evidence of impairment is also required (Ranseen & Parks, 2005).

Disability service providers in postsecondary educational establishments must decide on an individual basis which accommodations are appropriate and fair. Under certain circumstances this designation may also entitle the student to reduced course loads or special bursary support from student assistance programs. For those who qualify, several academic accommodations are possible: additional time for exams, distraction-free examination rooms, deadline flexibility, note-taking services, tutoring, alternative formats for exams, and adaptive equipment and technology (Ranseen & Parks, 2005).

Despite the availability of these accommodations, there has been surprisingly little investigation into their effectiveness. Miller et al., have concluded that additional time allowances for exams confers an advantage to students with ADHD, whilst Lewandowski et al., suggest that students with ADHD should be considered for alternatives to additional time accommodations because they do not take longer over academic tasks but are prone to making more mistakes. (Miller et al, 2013) (Lewandowski et al, 2008).

Marquart examined not only the impact of extended time on outcomes, but also on test-taking strategies for students with disabilities, students functioning at or above grade level, and students at risk academically (2000). Although the results showed no significant differences among three groups of students in terms of scores on extended-time versus standard-time administrations, Marquart found that extended time changed the way students approached the test (2000). Students reported that they were more positive, felt more relaxed, were more likely to answer every question, and were more motivated under extended-time conditions. Marquart's conclusion was that extended time stimulated students to use better test-taking strategies, and that these in turn may reduce test anxiety (2000).

Miller, Lewandowski, and Antshel ran a modified version of The Nelson-Denny Reading Test. The test was completed by 38 college students with ADHD and 38 matched controls under three conditions: standard time, time and one half, and double time. They found that the groups did not differ in the number of items attempted or answered correctly at standard time, time and one half, or double time. When comparing the ADHD group at extended time to non-ADHD peers at standard time, the ADHD group attempted and answered significantly more test items. Thus, researchers were able to conclude that the extra time presented an advantage to the ADHD group (2015). Therefore, this study suggested that extended time accommodations are not specific and perhaps not necessary for all college students with an ADHD diagnosis.

Results have been found to differ for the same students dependent upon the content of the test. Weaver examined the performance of college students on vocabulary

and reading comprehension tests and found that performance for students with learning disabilities improved in the extended-time and untimed conditions (1993). According to Weaver, the extra time allowed them the opportunity to process the needed information and demonstrate their knowledge. Weaver concludes that timing constraints masked their ability to perform on both tests. Students without disabilities, however, improved only marginally with extended time on the vocabulary test but improved in the extended-time or untimed conditions on the comprehension test (Weaver, 1993).

Brown, Reichel, and Quinlan researched the impact of ADHD-related executive function impairments on reading comprehension of adolescent students with ADHD. To assess the impact of extended time for reading comprehension, the Nelson-Denny Reading Test [NDRT] was used. Their findings indicated that many, but not all of our ?? participants with ADHD were unable to complete one or both sections of the NDRT within standard time allotments. This suggests that some diagnosed with ADHD do not need extended time on tests such as the NDRT, though many do need extended time to have a fair chance to show what they know and can do (2011).

The effects of extended time on SAT Reasoning Test performance were examined in a study funded by the College Board and Educational Testing Service. The study explored the impact of providing standard time, time and a half (1.5 time) with and without specified section breaks, and double time without specified section breaks on the verbal and mathematics sections of the SAT. Results indicated that extra time seemed to affect the math sections of the SAT more than the verbal sections. For students without

disabilities, the best performance was achieved under the 1.5-time condition with section breaks, and the lowest with standard time.

There is a great deal of published literature that supports the effect of interventions for students at the elementary and secondary levels, however there is limited empirical data that analyze interventions for college students with ADHD. In summary, the purpose of this paper is to determine if extra time accommodations on tests benefits those with a self-diagnosis of ADHD.

Chapter III

Methods

Subjects

Participants included 25 undergraduate college students from Rowan University. Of the 25 participants, nine were male and 16 were female ranging in ages from 18-23 years old. Of the 25 participants, eight students classified themselves as having ADHD and 17 participants did not. Individuals were recruited from the Rowan subject pool. Students were not discriminated against based on gender. Information regarding any other disorders such as learning disorder or another mental health diagnosis was not asked.

Instrumentation. Two critical reading sections of an Official SAT Practice Test 2014-2015 served as the main source of measurement in this study. All participants in the study completed both sections. The SAT, Scholastic Assessment Test is a standardized measure of high school achievement and college aptitude. The critical reading sections consist of sentence completions and reading comprehension questions for short and long passages. The two critical sections used, both contained 24 questions and is intended to be completed within 25 minutes. The SAT is a norm-referenced measure that incorporates both “power” and “speed” components (College Board, About, 2016).

A short questionnaire developed by the researcher was also administered (see x). This questionnaire asked questions such as gender, age, and if they have ever been diagnosed or classified as having ADHD.

Procedure. The goal of this study was to determine if there was a significant difference in the student's test scores under extended time accommodations versus standard time accommodations. Before the researcher could collect data, an informed consent approved by Rowan University Institutional Review Board, was utilized and it clearly explained the purpose, parameters, and details of study. Further, the informed consent emphasized the student's right to opt out of the study at any point in the process.

Participants completed two critical reading sections of an Official SAT practice test as well as a short questionnaire developed by the researcher. Students with and without ADHD were told they were taking a test to measure their critical reading skills. In part one of the experiment, participants were told they had the standard administration time available to complete the test (25 minutes). Part two of the study, the extended time condition, took place at least 24 hours later in the same testing room. In the extended time condition, participants were told they had time and a half to complete the test that was offered to them (37.30 minutes).

Both populations of students, those with ADHD and without ADHD were told this study was concerned with how well students perform in critical reading with standard administration time versus extended time. To encourage effort, the students were told, "Please give a strong effort in order to help us in our analysis of your critical reading skills when you complete this test with standard administration time" (or "when the time

to complete the test is extended”). In both testing conditions the participants were also given a five-minute warning when time was running low. The researcher recorded the time each student spent completing the test. Once the participant completed the test they were free to leave the testing room.

Statistical analysis. The independent variables was the group, with two levels, with and without reported ADHD and time given for the test at two points in time. The dependent variable was the test score. It was hypothesized that extra time would affect test performance of ADHD students more than students without ADHD. It was further hypothesized that groups would differ in test scores and that test scores would improve in general with extra time. In order to test these hypotheses a mixed ANOVA was run. In addition descriptive statistics were also reported.

Chapter IV

Findings

The researcher hypothesized that there would be an interaction between ADHD diagnoses, testing accommodations, as they relate to test scores. Specifically, it was hypothesized that those with ADHD would test scores would be higher when given extended time to complete a test. The independent variables used were time accommodations, being standard and extended time, as well as those with and without ADHD. The dependent variables are the test scores.

A mixed-group factorial ANOVA was performed to examine the effects of those with and without ADHD under different testing conditions in terms of their test scores . The data collected for each participant was his or her test score on the SAT critical reading section under separate time conditions. The between subjects factors were the self-report of ADHD (with ADHD or without ADHD). The within subject factor was the test condition (standard time or extended time).

The test scores for participants who self reported as having ADHD ($M = 13.188$, $SE = 1.310$) and those who did not self report as having ADHD ($M = 11.649$, $SE = 1.178$) were compared using a mixed two-way ANOVA. There was no between subjects effect of ADHD self-report on the test scores, $F(1,23) = .736$, $p = n.s.$ There was no overall effect of extra time, $F(1,23) = 2.180$, $p = n.s.$

The differences in the test scores between the standard time conditions and the extended time conditions for the participants who were self-diagnosed with ADHD and those who were not were compared by examining the interactions between the two factors on the mixed two-way ANOVA(see figure 1). There was no significant difference in test score between the participants under the standard time conditions and the extended time conditions for those who were self-diagnosed with ADHD and those we were not, $F(1, 23) = 1.625 p = n.s$

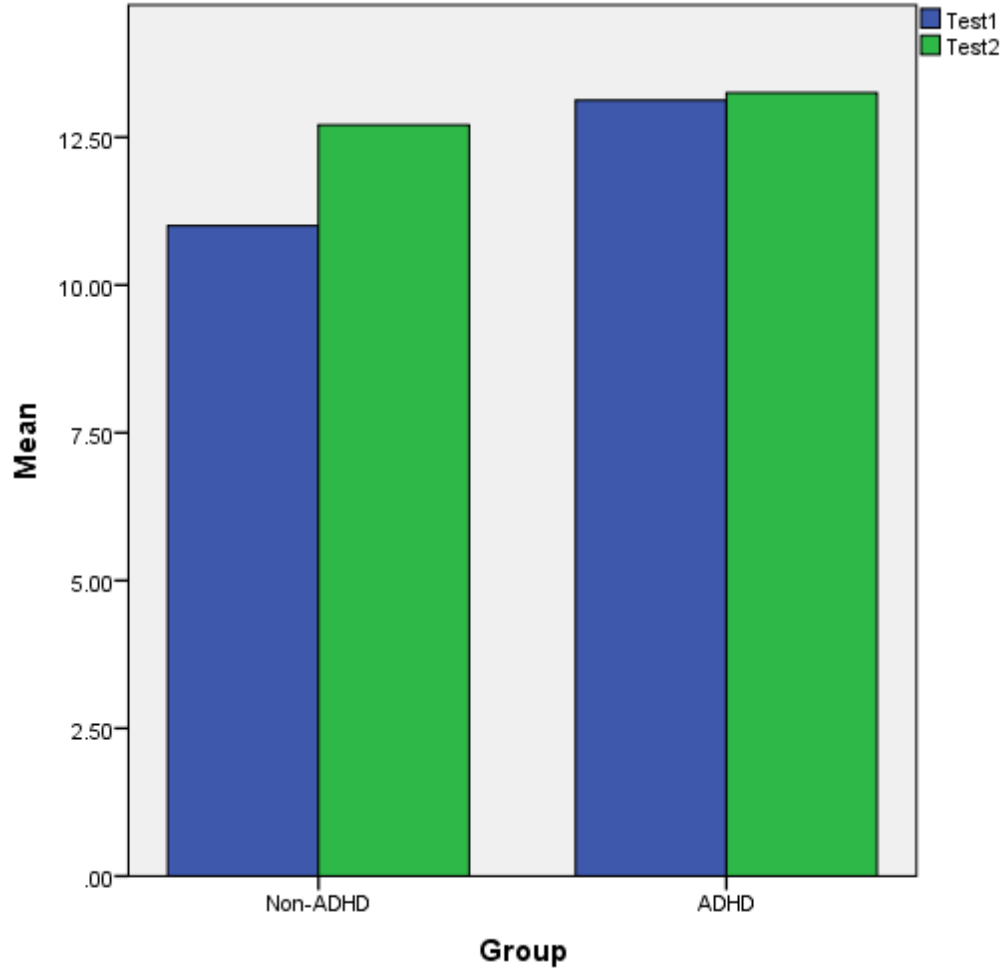


Figure 1. Means of test scores.

Chapter V

Discussion

The focus of this study was to examine the effects of extended time accommodations of those with Attention Deficit Hyperactivity Disorder (ADHD). Due to a growing number of students diagnosed with ADHD enrolled in post-secondary settings, we aimed to evaluate the effectiveness of testing accommodations for college students. Specifically, this study explored the effectiveness of extended time conditions, which is the most commonly used accommodation. It was hypothesized that students with ADHD would have higher test scores when given extended time to complete the test. No significant difference was found in the test score between the two time conditions for the participants who were self-diagnosed with ADHD and those who were not. Thus, the participants who were self diagnosed with ADHD did not score significantly higher when given extended time.

Despite the non-significant findings, the average scores improved from the standard time condition to the extended time condition for both with and without the self-diagnosis of ADHD. These results are consistent with previous findings, where extra time seemed to affect math sections of the SAT more than the verbal sections (Mandinach, et al., 2005). Under extended time conditions, students claiming to have ADHD used an average of 23.175 minutes to complete the test, well under the 37.30 minutes that were offered. Students without ADHD used an average of 17.991 minutes. Both groups used less than the standard time (25 minutes). Therefore, although students with ADHD on average used more time to complete the test than the non-ADHD group, neither group

took advantage of the extra time offered. These results are consistent with the Wadley and Liljequist study, where those with and without ADHD failed to use the full time offered (2013).

The discrepancy between the hypothesis and this finding may be explained by the small sample size. Particularly, the relatively small number of participants who were self diagnosed with ADHD raises suspicions about the findings. Other limitations include practice effects, in that test scores could have improved from standard time conditions to extended time conditions. Although the participants were given different tests measuring the same construct (critical reading skills), performance may increase due to familiarity of the test content. However, the familiarity could also lead to participants becoming bored or fatigued, thus explaining the lack of time used.

There may also be a more fundamental issue with comparing the test scores for those who were diagnosed with ADHD and those who were not due to its reliance on the self-reporting of ADHD diagnosis. Since different self-reports could potentially involve different criteria to be considered as having ADHD, the classification of participants with and without ADHD should be viewed with suspicion.

Furthermore, comorbid disorders should also be taken into consideration. Studies show “a comorbid diagnosis of ADHD and depression occurs in approximately 20% to 30% of patients, and ADHD and anxiety in more than 25% of patients” (Michielsen, Comijis, Semeiin, et al., 2013). This could attribute to the small increase seen in test scores average when given extra time.

Despite non-significant findings, the topic of this investigation is worth further examination. Investigation of the possible effects of extended time accommodations for the students diagnosed with ADHD on their academic performance has far reaching practical consequences in terms of public funding and the psychological well being of these students. An investigation with a sufficient sample size containing a representative proportion of participants is expected to yield greater confidence in the results. Studies with participants who are clinically diagnosed with ADHD are expected to yield more consistent operationalization of ADHD resulting in greater construct validity.

Future studies are strongly recommended since a sufficient amount of data has not been collected at the college level. An additional recommendation for further investigation would be to limit the length of time that is required in order to complete this study. This process tends to be time-consuming which can ultimately cause apprehension, fatigue, and low retention rates among individuals, especially those with ADHD. Also, future studies should focus on investigating other testing accommodations such as private testing rooms.

A final recommendation for this study could be to include students of other ages and/or universities. Performing this study with other ages and students of different universities could provide the investigator with more confidence in the results of this study and more importantly the accuracy of the results.

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