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# Attention Deficit Hyperactivity Disorder Treatment Impacts on Academic and Social Performance

Mark Allen Russell  
*Walden University*

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# Walden University

College of Social and Behavioral Sciences

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Mark Russell

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Walden University  
2016

Abstract

Attention Deficit Hyperactivity Disorder Treatment Impacts on Academic and Social  
Performance

by

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MS, Walden University

BS, Ellis College of SUNY IT

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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## Abstract

This study was an investigation of the effectiveness of treatment approaches for attention-deficit hyperactivity disorder (ADHD) examined through social, behavioral, and academic performances. Guided by Barkley's unifying theory of ADHD, a static-group comparison design was used to compare students receiving pharmacological treatment, psychosocial therapy, cognitive behavioral therapy, and a pharmacological-therapy combination. Archival data was obtained on middle and high school students diagnosed with ADHD (ages 11-18, N = 103). Data included GPA; number of disciplinary referrals; and Behavior Assessment System for Children—Teacher Rating Scale (BASC-2 TRS) scores of externalizing behavior (e.g., defiance, aggression), internalizing behavior (e.g., anxiety, depression), general school problems (e.g., attention, study skills), behavioral symptoms (e.g., social skills, leadership), and adaptive skills (e.g., understanding emotions and social cues). None of the BASC-2 TRS subscale scores differed between groups except for internalizing behaviors. The pharmacological-therapy combination group had lower internalizing behavior scores than the pharmacological-only group and the cognitive behavioral therapy group. The pharmacological-therapy combination group also had fewer disciplinary referrals than the pharmacological-only group and the cognitive behavioral therapy group. GPA did not differ by group, but it was inversely related to number of referrals. Because, overall, across the 7 outcome comparisons, no single group definitively emerged as highest performing, implications for practice and positive social change are that selection of ADHD treatment type may be best informed by physician and parent preference and determination of child's need and receptivity.

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## Dedication

This academic achievement was made possible through personal dedication, effort, commitment, and great support of family and friends. The sacrifices made over the past few years through the completion of my work have shown to be worthy. First and foremost to my wife Catherine, she has led me through this period with loving words of encouragement and support in all areas of life. Our children Mark II and Ashley have been on and completed their own educational adventures have also been supportive of my decision to complete my journey at this later stage in life. To my brother Brian and his wife Kelly I give thanks for support and encouragement. Through many interactions I have further developed my thinking and course in life. Finally to my mother Joyce Russell, I thank you for years of support and instilling in me the passion for life and never giving up on me through many adventures. Without these people in my life I feel I may not have ever achieved this educational goal. Today, I dedicate to them this professional academic achievement.

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## Chapter 1: Introduction to the Study

### **Background**

The exact causes of attention deficit hyperactivity disorder (ADHD) have yet to be identified but several factors have been considered. The exploration of neurotransmitter levels in the human brains of those diagnosed with and those without an ADHD diagnosis might lead the way to further discovery. Deregulation of these chemicals can lead to abnormal functioning of the brain (Lopez, 2006). Additionally, parts of the brain that are related to behavior may be found to be smaller in those diagnosed with ADHD (Johnston, 2009).

The executive functioning of the human brain is discussed as it ties in with the unifying theory of ADHD. This theory links inhibition to executive neuropsychological functions of the brain (Barkely, 1997). These executive functions are working memory, internalization of speech, and behavioral analysis (Lawrence, 2004).

Working memory is responsible for holding and processing new information in relation to information that has already been stored (Sergeant, 2002). This is important in the processes of reasoning, comprehension, learning, and constantly updating our memory (Purpura, 2010). Deficits in these processes lead to expression of symptoms that are used in the diagnosis of ADHD (Clark, 2006).

ADHD can be described as predominantly hyperactive, inattentive, or a combination of the two (American Psychological Association, 2013). These are categorized through expressed behaviors of the individual. Predominantly hyperactive is marked by having symptoms of impulsivity and hyperactivity (Lawrence, 2004).

Inattentive type ADHD can be recognized through having symptoms of inattention more than impulsivity and hyperactivity (Jones, 2010). The combined type will demonstrate behaviors associated with each of the first two (Jones, 2010). The number of behaviors expressed and observed will be used as a guide to classify these types of ADHD (Lipsey, 1993).

Through the use of these observed behaviors a diagnosis of ADHD can be made. The more specific and direct treatment approach can be developed for the individual suffering with the disorder.

ADHD diagnosis relies greatly on the observation of behaviors or expressed symptoms (McCandless, 2007). The rating of systems by parents along with teachers allows for a doctor or team of professionals to best diagnose an individual (Mongia, 2012). This study used data collected from the BASC-2 assessment tool.

The severity of social and academic problems cannot be seen as an exact science. There are far too many variables to consider from cultural, societal, and family differences. It can be noted that the number of issues that are related to the deficits found in those diagnosed with ADHD need further investigation.

While evidence supporting claims that medicinal treatments manage the expressed behaviors associated with ADHD does exist, additional research of the relationship between a combined treatment approach and the performances in social and academic arenas.

### **Statement of Problem**

Treatments for ADHD are not all equally effective and the best methods need to be identified for a diverse population (Saylor, 2002). The combinations of treatment methods such as pharmacological and behavioral approaches need further exploration. There is a lack of information collected and analyzed that leads to the most effective practices.

### **Definition of Common Terms**

The use of the DSM-IV has assisted in developing a common language used in the attention deficit discussion (Saylor, 2002).

*Attention deficit disorder (ADD):* A disorder that involves difficulty with attention without hyperactivity (Association, 2013).

*Attention deficit hyperactivity disorder (ADHD):* A developmental and behavioral disorder identified through measuring levels of attention, activity, impulsivity, and appropriate levels of age development (Association, 2013).

*Bipolar disorder:* A mental disorder that is characterized by intense emotional states going between high and low through periods of time (Association, 2013).

*Clinical trial or research study:* A program where participants with a particular condition test different treatments for the specific condition (NIMH), 2003).

*Combined type ADHD:* A developmental and behavioral disorder where inattention, hyperactivity, and impulsiveness are expressed (NIMH), 2003).

*Nonstimulant medications:* Chemicals that are not stimulating to the nervous system (Association, 2013).

*Predominantly hyperactive-impulsive type ADHD:* Disorder expressing hyperactivity and impulsive behavior along with enough attention to prevent the diagnosis of combined type (NIMH), 2003).

*Predominantly inattentive type ADHD:* Developmental disorder expressing symptoms of inattention but not overly disruptive or active. Predominantly inattentive type ADHD has been derived from ADD and has replaced that term (Armstrong, 1999).

*Psycho-stimulants or stimulants:* Chemicals that stimulate the central nervous system (Armstrong, 1999), (Association, 2013).

### **Purpose of the Study**

The purpose of this study is to gain a better understanding of the treatment designs and outcomes of those affected by ADHD. Through this understanding there may be an increased awareness of those treatment methods used for the most effective and efficient results. In the course of identification of the most successful treatments available, people responsible for the care of those diagnosed with ADHD will be better enabled to make an informed decision on the direction of treatment.

### **Research Questions**

#### **Relationship Between Therapy Type and GPA**

RQ1: What is the extent of differences in GPA across types of ADHD therapy?

Null hypothesis 1: There is no difference in GPA by any pairwise comparison of ADHD therapy type.

A one-way ANOVA procedure will be used to test the null hypothesis and answer the research question related to mean differences in GPA across therapy type. However,

the omnibus ANOVA results are not of interest; instead, focus will be on Tukey HSD pairwise comparisons between each therapy type (regardless of the significance level of the omnibus ANOVA).

### **Relationship Between Therapy Type and BASC-2 Subscales**

RQ2: What is the extent of differences in each of the five BASC-2 subscale scores across types of ADHD therapy?

Null hypothesis 2a: There is no difference in the BASC-2 TRS externalizing behavior subscale score by any pairwise comparison of ADHD therapy type.

Null hypothesis 2b: There is no difference in the BASC-2 TRS internalizing behavior subscale score by any pairwise comparison of ADHD therapy type.

Null hypothesis 2c: There is no difference in the BASC-2 TRS general behavior subscale score by any pairwise comparison of ADHD therapy type.

Null hypothesis 2d: There is no difference in the BASC-2 TRS BSI subscale score by any pairwise comparison of ADHD therapy type.

Null hypothesis 2e: There is no difference in the BASC-2 Behavioral subscale score by any pairwise comparison of ADHD therapy type. A one-way ANOVA procedure will be used to test each null hypothesis and answer the research question related to mean differences in each of the five BASC-2 subscale scores across types of ADHD therapy. However, omnibus ANOVA results are not of interest; instead, focus will be on Tukey HSD pairwise comparisons between each therapy type (regardless of the significance level of the omnibus ANOVA).

### **Relationship Between Therapy Type and Office Discipline Referral (ODR) Type**

RQ3: What is the extent of association between types of ADHD therapy and ODR type?

Null hypothesis 3: Type of ADHD therapy and ODR type are independent.

A two-way chi square procedure will be used to test the null hypothesis and answer the research question related to the association between therapy type and ODR type.

### **Relationship Between GPA and Total Number of ODRs**

RQ4: What is the extent of correlation between GPA and number of discipline referrals?

Null hypothesis 4: GPA and total number of referrals are not correlated.

A Pearson correlation procedure will be used to test the null hypothesis and answer the research question related to the relationship between GPA and total number of discipline referrals.

### **Exploratory Regression Models**

RQ5: Using total number of ODRs, therapy type, and the five BASC-2 TRS subscale scores, what is the best set of predictors accounting for variance in GPA?

Multiple linear regression procedures will be used to explore the combined and relative effects of the best set of statistically significant or near significant predictors of GPA.

RQ6: Using GPA, therapy type, and the five BASC-2 TRS subscale scores, what is the best set of predictors accounting for variance in total number of ODRs?

Multiple regression procedures will be used to explore the combined and relative effects of the best set of statistically significant or near significant predictors of the total number of ODRs.

### **Theoretical Framework**

The unifying theory of ADHD 1997 was the basis of my research. The executive functions of the human body are controlled through specific areas of the brain (Barkley, 1997). Through an increase of activity in these areas it is thought that ADHD symptoms arise (Jones, 2010).

Barkley's unifying theory of ADHD 1997 best explains the disorder (Barkley, 1997). It is explained that this disorder is characterized by signs of distractedness, arousal, impulsivity, and hyperactivity (Antoniou, 2009) (Barkley, 1997). The roles of the frontal cortex in the human brain are the executive: regulation of the mental skills necessary to sustain attention and lessen the influence of impulses on expressed behavior (Barkley, 2000). Drugs used in treatment usually are ones chosen to target this frontal area of the brain (Saylor, 2002). In targeting this area of the brain, the symptoms of ADHD are reduced (Broeders, 2010).

The use of the diagnostic statistical manual of mental disorders (DSM-IV) in the diagnosis leads to the examination of symptoms or behaviors, not of medical relevance. Behaviors that are expressed have the opportunity to be judged through social norms and are relevant to specific times and places (Parens, 2009). The use of the DSM-IV has also been identified as a possible contributor of over diagnosing this disorder in the United

States (Singh, 2008). Szasz (2001) suggested that ADHD was not discovered as much as it was invented to address the expressed behaviors of young people.

### **Social Change Implications**

It is critical to see the benefits of ADHD treatment on the personal or individual level before exploring benefits toward social enhancement. Through this better self, an individual may contribute in a most positive way to the community. Individuals fill specific roles in the family as well as community positions.

There are many things that can be influenced by ADHD treatments. Focus and clarity of thoughts of the individual participating in treatment may lead to a better understanding of events around them (Fleming, 2012). Self-awareness and the individual self-esteem may become better developed (Johnston, 2009). Through treatment of ADHD, participants might rediscover hidden talents that may have been covered by symptoms of their disorder (Fleming, 2012). The participants may be able to alter their own focus on the strengths and abilities at which they performed well (Fleming, 2012). Through treatment participants may develop skills to build better, stronger relationships with those in their lives (Barkley, 2010). Better well-being through mental and physical improvements may be seen after ADHD treatments (Fleming, 2012). Through the better management of impulsive behavior individual participants contribute to their own well-being and are better enabled to limit risky or careless behavior that may previously had put them at risk (Fleming, 2012). And finally, through the effective treatment of ADHD participants may find better financial well-being (Parker, 2013). The impulsive aspect of this disorder may have led to lack of skills in money management like paying bills,

weekly budget, and planning for future events (Fleming, 2012). Employment and career skills can now be more stable leading toward an increased quality of life. When people are feeling better, performing better, and living life better it contributes to a positive social change.

### **Assumptions and Limitations**

It is assumed that each student in the de-identified archival data was properly diagnosed with ADHD and eligible for inclusion in the study. It is also assumed that the multiple sources of archival data (e.g., school counselor records and academic records) are properly linked and accurate for each student.

The primary limitation is that data is on a limited number of students from a limited number of schools and school districts. Findings may not generalize to other students, schools, districts, or geographic areas of the country.

### **Summary**

The regular functioning of the human brain is sometimes disrupted leading to symptoms of ADHD being expressed (Barkley, 1997). Currently there is no cure for the ADHD disorder but treatments can relieve those symptoms that are expressed (Parker, 2013). Along with treatment, many individuals with ADHD can be successful in school leading to productive lives in the community as well. A historical background will be presented for consideration in deciding the best course of treatment.

The best treatment methods for ADHD may have yet to be seen. Research that is taking place in society today may enhance the understanding of this disorder and lead to different practices to better serve a specific population. In addition to those who face life

challenges with this disorder, people providing services and supervision to them will be affected with new ideas and best practices.

Chapter 2 will review current literature in regard to the evolution of treatment types and combinations of those in use by many professionals. Kofler (2011), examined the direct and indirect impacts of the working memory processes on the severity of social problems in children with ADHD. The executive functions of the brain will be discussed as a deficit in any or all of these functions may lead to ADHD symptoms. Sa'nchez (2011), Pelham (2005), Jarratt (2005) will each be presented as they lead to treatment methods and styles that contribute to the current practice.

## Chapter 2: Literature Review

### **Introduction**

This study explored the relationship between ADHD treatment and social/academic success. This relationship between treatment and success was assessed using the BASC-2 and academic reports from local school districts and service providers to those schools.

This chapter includes a review of literature related to the ADHD treatments leading to individual success. It will also include a review of literature involving the use of the BASC-2 to express the implications of using this tool. Additionally this chapter will examine the importance of determining the most effective treatment methods that lead to individual success and growth in society.

### **Historical Background**

ADHD is considered the most common psychiatric disorder affecting up to 3.5% of children (Nutt, 2007). The exact causes have not been clear but there has been a connection made between a range of genetic, environmental and biological variables (Parker, 2013). ADHD has been identified as a developmental disorder featuring deficits in focus, sustained attention, and impulse control (Reid, 2012). ADHD is also identified with increased activity with no clear theme or purpose, hyperactivity (Crano & Mellon, 1978). This diagnosis is usually given in childhood between the ages of three and seven although late onset or diagnosis in adulthood has been documented (Barkley, 2000). The children who progress with this disorder with or without treatment will have significant difficulty in school and social arenas (Reid, 2012). This usually results in academic

failure and conduct disorders (Reid, 2012). The burden of deficits falls to not only the individual but to the school and community as a social construct entirely.

ADHD has been categorized into three main frames: prominently hyperactive, inattentive, and a combination of the two (Rowland et al., 2008). Predominantly Hyperactive-Impulsive ADHD Disorder meets criterion through the symptoms of impulsivity and hyperactivity (Rowland et al., 2008). People with this type often may have signs of inattention that are not expressed as those used to identify this disorder that include squirming, fidgeting, restlessness, inappropriate comments, and near constant interruption (Rowland et al., 2008). . Those with these symptoms cause disruption in class causing difficulty for them and others to learn effectively (Reid, 2012). Inattentive Type ADHD presents with a lack of interest and may be looked at by others as being lazy or apathetic in most cases (Lareau, 1987). Those with this disorder are many times kept to themselves and out of the public eye (Barkley, 2010). They can be seen as having a lack of motivation but this does not need to be the case with proper treatment. People who have been diagnosed with Combined Type ADHD do not necessarily express one type of symptom as with the other types described (Rowland et al., 2008). Diagnosis of the Combined Type ADHD will meet at least six criterion used to diagnose both inattentive type and hyperactive-impulsive (Association, 2013).

In 2008 the National Institute for Health and Care Excellence (NICE) stated that medicine should be reserved as a sole treatment method (Barkley, 2010). NICE went on to share that ADHD symptom management with just medicine should only be considered when the expressed symptoms impair the daily living activities and prevent safe living

(Finke, 2011). These are obviously only the extreme cases where comorbid disorders apply (Finke, 2011). Medication could be offered as a way to manage symptoms allowing for a comprehensive treatment plan that incorporates psychological, behavioral, and educational methods. The application of these combined methods would allow for the individual to change the way issues that lead to the diagnosis of ADHD are resolved. The prescription of medicine for treatment of ADHD has increased four-fold in recent years (Finke, 2011).

### **Theoretical Foundation**

There has been no firm definition as to the cause or nature of attention-deficit disorder (ADD). . The use of the diagnostic statistical manual (DSM-V) criteria has been found to be useful for the diagnosis of attention disorders (Barkley, 2000).

The combination of neurological imaging and the DSM-V researchers and treatment providers are getting a clearer picture of the biological and environmental contributions to attention disorders (Barkley, 2000). The DSM-V for the diagnosis leads to the examination of symptoms or behaviors, not of medical relevance (Association, 2013). Behaviors that are expressed have the opportunity to be judged through social norms and are relevant to specific times and places (Parens, 2009). The use of the DSM-V has also been identified as a possible contributor of over diagnosing this disorder in the United States (Singh, 2008).

Psychoanalysts and psychologists do not share the same view of the cause or causes of ADHD and symptoms may be the cause (Allison, 2010). The use of criterion:

hyperactivity, impulsiveness, and inattentiveness can be conceptualized in both schools of thought. These criteria are also seen as age appropriate in young children.

The presence of these criteria in excess present difficulties in the lives of children as well as for those involved with the life of those children (Allison, 2010). The teachers become frustrated in failing attempts to teach those who are lacking in the appropriate attention. The family or the responsible adults often report feelings of frustration and despondency with regard to their parenting styles, abilities, and even relationship with their children (Allison, 2010). This causes the child to have additional pressure in the home as well as at school. Responsible adults place pressure on those professionals involved with treatment demanding that something be done about the child and their inability to focus. The need to address both the condition of ADHD itself and the impact on the relationships of those children has been identified (Allison, 2010).

Control of human behavior is influenced through the executive functioning processes (Sergeant, 2000). The executive functioning shifts in the development from childhood through adulthood as experiences increase in complexity (Nutt, 2007). The use of a pharmacological approach that is introduced by the medical professional may work well for that immediate relief of symptoms or criterion used to diagnose ADHD. This approach may be combined with the cognitive approach to address ways to manage hyperactivity, impulsiveness, and inattentiveness by the individual (Fleming, 2012).

Barkley (2000) found that the role of executive functioning takes place in the frontal cortex of the human brain (Barkley, 2000). This study further explains that the regulations of skills necessary to increase attention and lessen impulsivity are also

controlled by the frontal cortex (Barkley, 2000). Throughout the executive functions, social intelligence is found and deficits in this area are present in those individuals with ADHD (Barkley, 2000). Geurts and Broeders (2010) examined the use of executive functions and the genetic connection with individuals with ADHD (Broeders, 2010). The Theory of Mind (ToM) and pragmatic language use has also been linked to developmental dysfunctions identified with ADHD (Geurts, 2010). The features of ADHD being hyperactivity, impulsiveness, and inattentiveness allow these areas to be examined in relation to the ToM (Broeders, 2010). Other deficits that are seen with ADHD are social interactions and communication even though these are not needed as criterion for diagnosis (Association, 2013).

Saylor, Buermeyer, Spencer, and Barkley (2002) have described ADHD as a more complex disorder. A full range of neuropsychological deficiencies such as working memory and the executive functioning have been identified as being involved in ADHD (Saylor et al, 2002). They questioned a diagnosis of ADHD without asking about the individual relationships with peers as well as the extent of social activity (Saylor et al, 2002). The works of Saylor et al., Buermeyer, Spencer, and Barkley 2002 explore new definitions for ADHD. These new definitions should include a look at the executive functioning, behavioral inhibition, and impairments not seen as attention deficits (Saylor et al., 2002). Central impairments in the frontal cortex influencing executive functioning may be more influential than thought previously (Saylor et al., 2002).

The Quay-Gray Model of attention deficit hyperactivity disorder states that impulsiveness arose from lower functioning of the human brain behavioral inhibition

system. This system is referred to as being sensitive to conditioned punishment. This Quay-Gray Model predicts that individuals with ADHD are less sensitive to conditioned punishment signals from the brain (Wiener, 2007). Research on parent and teacher ratings of ADHD identifies the factor of inattentiveness. The link between poor behavioral inhibition and low levels of attention has also been established (Wiener, 2007). Along with these connections, executive functioning and cognitive deficits have been shown to fall within the realm of self-regulation (Wiener, 2007).

### **Variables Involved**

Social Performance and Academic Performance was measured through the use of the BASC-2. The social and academic performance measured through school and ADHD student form, social withdrawal, internalizing problems, and skills in adapting to a changing environment through the domains provided with the BASC-2 rating scale.

### **Instruments Used in Data Collection**

Through the use of the BASC-2 Monitor I have obtained data about treatment options, diagnostic type, as well as the impacts in family and school environments. The diagnostic type: inattentive, hyperactive, or combined type ADHD was first identified. The treatment options being first explored will be but not limited to the behavioral approaches: behavioral training, positive reinforcement, clinical behavioral therapy, and cognitive behavioral therapy. The pharmacological approach consisting of but not limited to: stimulant and anti-anxiety drug use. In addition, the multimodal approach that combines each of the behavioral approaches with the use of each pharmacological approach.

The variables examined were the diagnostic types and treatment approaches previously described, the student grade point average (GPA), attendance in school as well as in each course, school record of behavioral concerns and the BASC-2 TRS. Through analysis of these data this study offers insight on the social and academic performances as they relate to the treatment method of ADHD.

### **Summary**

Attention Deficit Hyperactivity Disorder has appeared to be one of the problems worldwide with children and adolescents.

The most effective treatments for this disorder may never be found as the severity of the symptoms as well as the uniqueness of individuals vary. Combined treatments have been used to show the most lasting positive outcomes as they allow individuals to learn different techniques while having the symptoms regulated. This study will examine more closely the impacts of effective treatment on social and academic performance. This chapter has concluded with the description of my study and how it will contribute to the existing body of literature. Chapter 3 will discuss the methodology used to administer this study.

## Chapter 3: Research Method

### **Introduction**

This chapter begins with a statement of the purpose for this study as indicated through the gap in literature found in Chapter 2. Further discussion focuses on the research design, population being studied, and rationale for the sample selection. In this chapter I will describe the design and research methodology used to examine a relationship between ADHD treatments and success in areas of academic and social nature. In this chapter there is also a description of the sample size, research design, procedure used for data collection, and the methods used to protect the rights of those whose data has been examined. There is a description of the instruments used for data collection as well as description of the data. There are also the data analysis procedures. Supplementary data is also provided for the instruments that will be used with respect to their validity and reliability. There is also a discussion of ethical considerations along with solutions to resolve any identified challenges. The chapter concludes with a summary.

### **Purpose of the Study**

The purpose of this study was to gain a better understanding of the treatment designs types and outcomes of those affected by ADHD. Through this understanding there may be an increase in the awareness of those treatment methods used for the most effective and efficient results. Through identification of the most successful treatments available those people responsible for the care of those diagnosed with ADHD could be better enabled to make an informed decision on the direction of treatment.

More specifically, the purpose of this quantitative study is to determine whether there are significant relationships between attention deficit hyperactivity disorder treatment types, social, and academic performances and the way each treatment method accounts for these changes. The independent variable in the study is the treatment type. Four treatment types are expected but the application of any specific treatment or combination of treatments will be examined. The dependent variables, broadly construed, are academic and social performance.

A variety of statistical analysis techniques will be used depending on the data collected and the hypotheses. This study will assess the relationships between four treatment types: pharmacological, individual counseling, cognitive behavioral therapy, and combined treatment methods.

This information from the parents has already been collected by the social workers with the BOCES alternative education programs along with other professionals. The relationships between these treatment types and performance in the social and academic arenas will be noted. Through this study using the measures outlined an identifiable group of young learners who express the characteristic behaviors expressed that are used to diagnose ADHD could not be established in regard to their academic and social performances as measured.

### **Research Design**

This study used a quantitative pre-experimental static-group comparison design (Campbell & Stanley, 1963) using archival data collected on a regular basis within each of the school districts identified as well as data collected for the specific purposes of this

research. A quantified systematic review of data may reflect the effectiveness of different modes of treatment for ADHD with respect to academic and social performance.

### **Description of Participants**

Data in this study was collected from alternative education middle and high schools with an age range from 12 to 18 years old. These schools are from a centrally located area in a tri county area in central New York State. The districts included the local cities of: Schenectady with a population of 66,135 in 26,000 households, Oneida with a population of 33,585 in 4,500 households, Rome with a population of 3,524 in 4,000 households, and Utica with a population of 54,878 in 5,129 households (Commerce, 2013). These data have been taken from the 2012 census bureau. Areas surrounding these cities are a suburban and rural area. The 5,882 square mile area is an important agricultural center and encompasses the heavily forested wilderness areas just to the north that are part of New York's Adirondack Park (Commerce, 2013).

### **Human Subject Considerations**

The federal government has developed regulations for the ethical conduct when using human subjects in research to better ensure that ethical conduct occurs (Antoniou, 2009). Through these regulations comes focus on planning for and managing issues that come from the research relationship. There will be no contact between the researcher and the students in any way, data about the student population will be collected using archival data from school records and by teacher ratings of students.

Data obtained from teachers was anonymous. All data related to students was confidential when initially collected and linked to teacher ratings of students. Once

linked via student identifiers, the data was de-identified. There was no compensation associated with teacher participation, or to students or the district. Aggregate analysis and findings will be shared with the school districts and disseminated to teachers, parents, and students as each district deems appropriate. Findings may also be presented at professional conferences or published in a journal.

### **Clearance from IRB**

After approval from the Internal Review Board (IRB) specific to Walden University, data was collected from several component school districts in the specified area. The IRB approval number first given was 11-20-15-0134861 and this remained the same after I applied and changes were accepted. It was explained to the district superintendents and through them to the school boards of education that the data collected will in no way cause a disruption in the regular activities of the school district. They were further informed of the benefits of participation and given the opportunity to ask any questions that they may have prior to and throughout the study period.

### **Sample Selection Method**

Interest in learning about large populations of people serves as a basis for psychological research (Association, 2013). For this study, the population is those dealing with ADHD symptoms. With this target population being so large, it is necessary, for practical purposes, to examine only a sample. It is hoped that the sample will be representative of the target population so generalizations can be made to the entire population. To assess any sampling bias in the study I compared the characteristics of the sample with the characteristics of the whole target population.

A purposive sampling approach fits the intent and reasons for this study. This sample selection method is non probability sampling where participants with specific, key characteristics are invited to participate. This sample came from school districts that have existing data on social and academic performances of students with ADHD. The existing data was augmented with data collected directly from the district teachers. Purposive sampling was also selected because it requires less time and money than other more extensive methods (Nutt, 2007).

### **Power Analysis for Target Sample Size**

The principal analyses includes one-way ANOVAs, two-way chi square, and correlation. Power analysis for sample size is based on the most demanding of these, the one-way ANOVAs. With four treatment types expected, alpha level of .05, and power level of .70, a total sample of 88 student records was needed to detect a Cohen's  $f$  effect size of .325 (between a medium and large effect). For the same alpha and power parameters a correlation of .26 and Cohen's  $w$  of .32 (for the chi square) will be detectable with  $N = 103$ . All eligible student records will be used with power increased to detect even smaller effect sizes as  $N$  exceeds the target size of 103.

### **Instrument and Measurement Procedures**

Research in the social sciences relies heavily on testing and measurement instruments (Toplak, 2005). The selection process and the scores that will be measured contribute greatly to the validity and usefulness of the results. Presently there are hundreds if not thousands of testing and measurement instruments available for scholarly researchers (Association, 2013). Making the best selection of tests and measures for my

specific research study was challenging with the absence of a general database or list of tools already known to be reliable.

### **Behavior Assessment System for Children**

The Behavior Assessment System for Children (BASC-2) fits the needs of this study in assessing the behaviors and emotions of preschool through college-age students. The BASC-2 has several forms (Pearson Project Team, 2007).

Among these forms are the Teacher Rating Scales (TRS), Parent Rating Scales (PRS), Self-Report of Personality (SRP), Student Observation System (SOS), and Structured Developmental History (SDH) (Pearson Project Team, 2007). For this study, the TRS was utilized as it allows for the teacher to observe and make reference to the social behaviors in the school setting, which is the focus of this study. This rating instrument was designed to measure maladaptive as well as the adaptive behaviors using a 4-point response scale of Never Seen, Sometimes, Often, or Almost Always.

The TRS specifically assesses the student in the areas of: externalizing problems, internalizing problems, general problems related to school, behavioral symptoms index (BSI), and adaptive skills (Pearson Project Team, 2007). It also includes three validity checks (Pearson Project Team, 2007). Externalizing problems such as defiance, aggression, lying, angry outbursts, lack of accountability, and irritability are those problems that are seen by others (Pearson Project Team, 2007). These are sometimes the ones that are more easily re-directed and measured. The internalizing problems (anxiety, depression, and somatization) need to be recognized or diagnosed to help determine the most appropriate treatment method (Pearson Project Team, 2007). The general problems

as related to school (attention, learning difficulties, withdrawal, and study skills) are a combination of internal and external. Observers will witness some general problems but some may be unobservable (i.e., internal). The BSI measures social skills, leadership, functional communication, appearance, and conversation (Pearson Project Team, 2007).

The BASC-2 has incorporated validity indexes that are designed to assist clinicians' interpretation of data collected (Pearson Project Team, 2007). These validity tools are used to better detect responses that are careless or untruthful (Pearson Project Team, 2007). They also filter misunderstanding and other threats to response validity (Pearson Project Team, 2007).

### **Externalizing Problems**

Cronbach's alpha of .91 has been reported for the externalizing problems subscale of the TRS (Measure Profile, 2012). The following are examples of externalizing problems:

- **Defiance:** seen as a challenging attitude, open or bold resistance to or disregard for authority (Measure Profile, 2012). Students may simply refuse to comply with direction or immediately act out in a way that proves counterproductive to meeting expected outcomes (Measure Profile, 2012).
- **Aggression:** seen as the action of violating by force the rights of another person (Measure Profile, 2012). Expressed when a student who physically or verbally hurts or makes an effort to cause harm to another (Measure Profile, 2012).

- Lack of accountability: seen as avoiding the owning of own actions (Measure Profile, 2012). When a student avoids accepting his/her own actions that lead to the outcome whether positive or negative in perception (Measure Profile, 2012).
- Lying: seen as sharing information known to be false (Measure Profile, 2012). When a student knowingly shares stories or causes others to believe things that are false in nature (Measure Profile, 2012).
- Irritability: seen as annoying; readily exciting other people to impatience or anger (Measure Profile, 2012). Expressed when a student incites other behaviors that are disruptive to the environment (Measure Profile, 2012).
- Angry outbursts: seen as positions of anger with seemingly no trigger (Measure Profile, 2012). These may be expressed through a student's sudden verbal or physical outburst that appears to be internally driven, with no visible external cause (Measure Profile, 2012).

### **Internalizing Problems**

Cronbach's alpha of .90 has been reported for the internalizing problems subscale of the TRS (Measure Profile, 2012). The following are examples of internalized problems:

- Anxiety: as demonstrated and observed through behavior specific characteristics including nervousness, fear, apprehension, and worrying (Measure Profile, 2012). Times when the student may be quiet and not participate due to the fear of being criticized or judged by peers and other people present (Measure Profile, 2012).

- Depression: that has been clinically diagnosed as well as behaviors observed such as sadness, inactivity, difficulty in thinking and concentration, a significant increase or decrease in appetite and time spent sleeping, feelings of dejection and hopelessness, as well as suicidal tendencies (Measure Profile, 2012).
- Somatization: seen as the expression of psychological needs through physical signs or symptoms (Measure Profile, 2012). This is associated with attributions of responsible adults as attention seeking.

### **General Problems**

Cronbach's alpha of .91 has been reported for the general problems subscale of the TRS (Measure Profile, 2012). The following are examples of general problems related to school:

- Attention: observed as a general lack of attention to class lectures, teaching resources, and direction (Measure Profile, 2012). A student lacking the ability to focus on the task at hand is usually shown as boredom or distracting behaviors like talking or fidgeting (Measure Profile, 2012).
- Learning difficulties: observed as clinically diagnosed or learning through nontraditional methods (Measure Profile, 2012). These are usually identified through the assessments that are regularly given and scored throughout the terms by the teacher (Measure Profile, 2012).
- Withdrawal or withdrawal behavior: observed as the physical or psychological removal of the student from a stressor, real or imagined (Measure Profile, 2012). Withdrawal is expressed as a student avoiding the learning process due to the

presence of perceived stress (Measure Profile, 2012). This may be a student's way to maintain a safe feeling in a foreign environment causing the student a lack in growth or comfort in the environment. This would be expressed as a student maintaining a closed personality, staying alone during times of potential social interaction.

- Study skills: observed as the expressed ability to perform on assignments (Measure Profile, 2012). The student lacks the ability to adequately prepare for assessments to achieve an acceptable score under review.

### **Behavioral Symptom Checklist (BSI)**

Cronbach's alpha of .91 has been reported for the BSI subscale of the TRS (Measure Profile, 2012). The BSI includes:

- Adaptive skills: observed through the methods used to deal with a stressor (Measure Profile, 2012). Included with these skills are maintaining interpersonal relationships, understanding emotions and social cues.
- Social skills: observed through contacts with others and functioning abilities. Skills include understanding fairness and honesty, obeying rules and laws (Measure Profile, 2012).
- Leadership: observed through contacts and functioning abilities with the addition of looking at initiation of activity (Measure Profile, 2012). Expressed when a student accepts the role of leading a group activity either academically or socially (Measure Profile, 2012).

- Functional communication: observed as connecting with others to complete tasks and carry out directions (Measure Profile, 2012). This is expressed when one student makes connections with others to accomplish a common goal or task (Measure Profile, 2012).

### **Construct, Convergent, and Discriminative Validity**

The BASC-2 manual discusses several validation measures designed to be used in the assessment of the BASC-2's similarity to other behavioral scales used today. For the Teacher Rating Scales form, the tool was compared to several behavioral assessment tools, such as: the Achenbach System of Empirically Based Assessment Caregiver Teacher Report Form (ASEBA), Conners' Teacher Rating Scale-Revised (CTSR-R), and the previous version of the Behavior Assessment System for Children (BASC). Correlations between subscales were high, between .70's and .80 addressing similar content; as expected the BASC-2 was highly correlated with the previous BASC form being in the .90's (Measure Profile, 2012).

### **Archival Data**

The GPA, ADHD treatment type, and disciplinary referral information of referent students were obtained from school administration following the execution of a data use agreement (see Appendix A). The Office Discipline Referral form (ODR; see Appendix B) is a tool used by schools for gathering key, relevant information regarding student behavior. The student name, referring staff, grade level, and the date and time are recorded on these simple to use forms. Sections for recording the location of the expressed behavior, the specific behavior observed, any others involved, brief comments,

as well as for the events leading up to the behavior are well formatted on the referral forms (see Appendix B).

Of particular focus for the inferential analyses purposes of the proposed research are the behaviors that precipitated a discipline referral. On the ODR, behavioral offenses are categorized as Stage 2 or Stage 3. Stage 2 offenses are significant or intense offenses such as abusive language, bullying, insubordination, and tardiness. Stage 3 offenses are extreme or harmful to other behaviors such as arson, battery, robbery, and indecent exposure. The list of Stage 2 and Stage 3 ODR behaviors are shown in Figure 1.

<b>Stage 2</b>	<input type="checkbox"/> Abusive/Profane Language <input type="checkbox"/> Class Cutting/Leaving w/o Permission <input type="checkbox"/> Deliberate Misuse of Property <input type="checkbox"/> Display of Patently Offensive Material <input type="checkbox"/> Disruptive Conduct <input type="checkbox"/> Dress Code Violation <input type="checkbox"/> Forgery <input type="checkbox"/> Gambling <input type="checkbox"/> Indecent (Obscene) Gesture <input type="checkbox"/> Insubordination	<input type="checkbox"/> Interference w/ School Personnel <input type="checkbox"/> Intimidation <input type="checkbox"/> Loitering <input type="checkbox"/> Non-Compliance w/ Disciplinary Action <input type="checkbox"/> Off Limits <input type="checkbox"/> Open Defiance <input type="checkbox"/> Physical Contact, inappropriate <input type="checkbox"/> Plagiarism/Cheating <input type="checkbox"/> Possession of Prohibited Item	<input type="checkbox"/> Possession/Use of Stolen Property <input type="checkbox"/> Reckless Vehicle Use <input type="checkbox"/> Tardiness <input type="checkbox"/> Technology, Use Violation <input type="checkbox"/> Theft: Minor <input type="checkbox"/> Trespassing <input type="checkbox"/> Truancy <input type="checkbox"/> Vandalism Mino <input type="checkbox"/> Willful Disobedience
<b>Stage 3</b>	<input type="checkbox"/> Alcohol/Drug <input type="checkbox"/> Arson or Attempted Arson <input type="checkbox"/> Assault/Menacing <input type="checkbox"/> Battery <input type="checkbox"/> Bomb Threat <input type="checkbox"/> Burglary <input type="checkbox"/> Extortion <input type="checkbox"/> False Fire Alarm	<input type="checkbox"/> Fighting <input type="checkbox"/> Firecrackers/Explosives <input type="checkbox"/> Gang Identifier <input type="checkbox"/> Harassment or Bullying Based on: <input type="checkbox"/> Disability <input type="checkbox"/> Sex <input type="checkbox"/> Other <input type="checkbox"/> Race, Color, or National Origin <input type="checkbox"/> Hazing <input type="checkbox"/> Indecent Exposure	<input type="checkbox"/> Robbery <input type="checkbox"/> Theft: Major <input type="checkbox"/> Threat of Violence <input type="checkbox"/> Tobacco, Use and/or Possession <input type="checkbox"/> Vandalism Major <input type="checkbox"/> Weapon: Call Student Services 503.916.5460 immediately to consult about next steps

*Figure 1.* List of significant or intense (Stage 2) and extreme or harmful (Stage 3) behaviors as classified on the Office Discipline Referral (ODR) form.

### Treatment Types

There are four ADHD treatment types that will be examined for the purposes of this study; the pharmacological approach, individual counseling approach, cognitive behavioral therapeutic approach, and a combined treatments approach. The pharmacological approach includes the use of stimulant as well as non-stimulant drugs

including but not limited to antidepressants, and high blood pressure medications (Doöpfner, 2011). Several examples of these stimulants are; methylphenidate seen with Ritalin, Mehylin, Metadate, Concerta, and Daytrana. Dextroamphetamine and amphetamine as found in Adderall. Dextroamphetamine as the stimulant found in Dexedrine. Lisdexamfetamine dimesylate or Vyvanse that stays inactive until metabolized in the human body. Dexmethylphenidate is another stimulant commonly used and found in Focalin. These drugs effectively manage all of the primary symptoms of ADHD such as impulsivity, hyperactivity, and inattention (D. Nutt, 2013). Non-stimulant drugs can also be used and include but are not limited to; Strattera (atomoxetine), Aplezin, Wellbutrin, Zyban (bupropion) and, Intuniv. High blood pressure medicines can also be useful in managing the symptoms related with ADHD. Tenex (guanfacine), and Catapres (clonidine) have been found to be effective (Lopez, 2006).

Individual counseling is a treatment approach known as psychosocial therapy has been identified as effective in treating ADHD in children and adults (NIMH, 2003). This psychosocial approach is a critical part of treatment plans for individuals diagnosed with ADHD.

Cognitive behavioral therapy was originally developed to assist people in coping with anxiety and depression (Mongia, 2012). This therapy aids in the change of the irrational thought process that interfere with staying on task or completing them at all. Those people with ADHD who may think that things need to be perfect or that they never do anything right benefit from the change in thinking brought about through CBT. CBT

instills practical strategies and instruction to diminish three of the greatest problems related to ADHD; time management, planning, and organization. Cognitive behavioral therapy helps reverse the negativity that torments adults with ADD preventing them from reaching goals (Mongia, 2012).

Combined treatment approach will be the combination of counseling and pharmacological approaches. The type of counseling may vary depending on the age of the individual and the preferences of the counselor.

### **Summary of Variables, Hypotheses, Analysis Plan**

ADHD treatment type (pharmacological, individual counseling, cognitive behavioral, combined), 2014-15 academic year cumulative GPA, type and number of 2014-15 academic year Stage 2 behavioral offenses, and type and number of 2014-15 academic year Stage 3 behavioral offenses will be archival data collected from referent student records. A teacher of a referent student will complete the BASC-2 TRS, yielding subscale scores for externalizing behavior, internalizing behavior, general school problems, and BSI (a composite of adaptive skills, social skills, leadership, functional communication, and daily living abilities). Research questions, null hypotheses, and analysis plan related to these variables of interest are listed below.

#### **Relationship Between Therapy Type and GPA**

RQ1: What is the extent of differences in GPA across types of ADHD therapy?

Null hypothesis 1: There is no difference in GPA by any pairwise comparison of ADHD therapy type.

A one-way ANOVA procedure will be used to test the null hypothesis and answer the research question related to mean differences in GPA across therapy type. However, the omnibus ANOVA results are not of interest; instead, focus will be on Tukey HSD pairwise comparisons between each therapy type (regardless of the significance level of the omnibus ANOVA).

### **Relationship Between Therapy Type and BASC-2 Subscales**

RQ2: What is the extent of differences in each of the five BASC-2 subscale scores across types of ADHD therapy?

Null hypothesis 2a: There is no difference in the BASC-2 TRS externalizing behavior subscale score by any pairwise comparison of ADHD therapy type.

Null hypothesis 2b: There is no difference in the BASC-2 TRS internalizing behavior subscale score by any pairwise comparison of ADHD therapy type.

Null hypothesis 2c: There is no difference in the BASC-2 TRS general behavior subscale score by any pairwise comparison of ADHD therapy type.

Null hypothesis 2d: There is no difference in the BASC-2 TRS BSI subscale score by any pairwise comparison of ADHD therapy type.

Null hypothesis 2e: There is no difference in the BASC-2 Behavioral subscale score by any pairwise comparison of ADHD therapy type.

A one-way ANOVA procedure will be used to test each null hypothesis and answer the research question related to mean differences in each of the five BASC-2 subscale scores across types of ADHD therapy. However, omnibus ANOVA results are

not of interest; instead, focus will be on Tukey HSD pairwise comparisons between each therapy type (regardless of the significance level of the omnibus ANOVA).

### **Relationship Between Therapy Type and Office Discipline Referral (ODR) Type**

RQ3: What is the extent of association between types of ADHD therapy and ODR type?

Null hypothesis 3: Type of ADHD therapy and ODR type are independent.

A two-way chi square procedure will be used to test the null hypothesis and answer the research question related to the association between therapy type and ODR type.

### **Relationship Between GPA and Total Number of ODRs**

RQ4: What is the extent of correlation between GPA and number of discipline referrals?

Null hypothesis 4: GPA and total number of referrals are not correlated.

A Pearson correlation procedure will be used to test the null hypothesis and answer the research question related to the relationship between GPA and total number of discipline referrals.

### **Exploratory Regression Models**

RQ5: Using total number of ODRs, therapy type, and the five BASC-2 TRS subscale scores, what is the best set of predictors accounting for variance in GPA?

Multiple linear regression procedures will be used to explore the combined and relative effects of the best set of statistically significant or near significant predictors of GPA.

RQ6: Using GPA, therapy type, and the five BASC-2 TRS subscale scores, what is the best set of predictors accounting for variance in total number of ODRs?

Multiple regression procedures will be used to explore the combined and relative effects of the best set of statistically significant or near significant predictors of the total number of ODRs.

### **Description of Procedures**

Data that had already been collected for purposes other than this research study will be gathered and analyzed. These archival data are aligned with the data collected with the BASC-2 instrument to reflect the performances that were looked at in this study. These data collected through the BASC-2 were organized as four subscale scores in the following areas: externalizing problems, internalizing problems, general school problems, and the BSI.

I proposed to study The Board of Cooperative Educational Services (BOCES) of the Madison-Oneida County District as well as the Oneida-Herkimer-Madison Districts. I then explained the need for a best practice approach to ADHD treatment as the school districts have used best practice approaches in teaching. The specific study to the district population appealed to the superintendents of the districts as a way to improve the environment of each school they would be responsible for. I met with independent superintendents of the school districts to present and to follow up with any questions in the formal proceedings that will be well documented. I will also made myself available to each of the board members contact information allowing them to ask any questions or for regular updates as they see fit.

After the superintendents approve my study, I will address the adults responsible for the student attending school and discuss their participation. I will also include contact information for any questions or concerns that they may have after a thorough presentation of the BASC-2 and other information regarding the study.

I collected BASC-2 data for the identified students through the school psychologists, social workers, and professionals who already were in possession of these data for purposes other than this study. These data collected through the BASC-2 will be aligned with archival data from the districts. This data will be made available through each of the component districts service providers.

### **Summary**

Treatments for ADHD may not all equally effective and the best methods need to be identified for a diverse population. The combination of treatment methods such as pharmacological and behavioral approaches needs further exploration. There is a lack of information collected and analyzed that leads to the most effective practices.

The purpose of this study was to gain a better understanding of the treatment designs and outcomes of those affected by ADHD. Through this understanding there could be an increase in the awareness of those treatment methods used for the most effective and efficient results. Through identification of the most successful treatments available those people responsible for the care of those diagnosed with ADHD could be better enabled to make an informed decision on the direction of treatment.

## Chapter 4: Data Analysis and Results

### **Introduction**

This study examined the relationship of students with ADHD in regard to their treatment types, behavioral episodes, attendance, grade point average, gender, age, and the reported scores using the BASC-2. The grounding hypothesis of this study was that students who engaged in a cognitive approach to treatment for ADHD would perform better academically and socially.

Treatments for ADHD are not all equally effective and the best methods need to be identified for a diverse population. The combination of treatment methods such as pharmacological and behavioral approaches needs further exploration. There is a lack of information collected and analyzed that leads to the most effective practices.

### **Purpose of the Study**

The purpose of this study was to gain a better understanding of the treatment designs and outcomes of those affected by ADHD. Through this understanding there could be an increase in the awareness of those treatment methods used for the most effective and efficient results. In the course of identification of the most successful treatments available those people responsible for the care of those diagnosed with ADHD could be better enabled to make an informed decision on the direction of treatment.

### **Data Collection**

Data were collected from students attending the BOCES districts including; Camden, Canastota, Hamilton, Madison, Morrisville-Eaton, New York State School for the Deaf, Oneida, Rome, Stockbridge Valley, Vernon-Verona-Sherrill, Brookfield,

Clinton, Holland Patent, New Hartford, New York Mills Union Free School, Oriskany, Remsen, Sauquoit Valley, Utica City, Waterville, Westmoreland, and Whitesboro school districts. The data were collected with assistance from school social workers, school psychologists, and professionals providing services with Esenell Choices Inc.

Data collection efforts began in October 2015 but started to produce data for analysis in the spring of 2016. This delay was due to the districts interest in keeping student information safe and secure. Confidentiality of student records was of the utmost importance throughout this study. The social workers from the individual alternative education programs were less than eager to assist with the data collection so I changed my plan with approval of the IRB to address the superintendents and workers at the local district specifically. I saw a much better level of interest and engagement once that dialogue started. Data use agreements were delivered with a clear explanation of the data being collected and how it was to be analyzed. Professionals were very helpful and all questions answered to their satisfaction throughout the whole process.

### **Descriptive Statistics**

Descriptive statistics are presented to illustrate the general participant data in this study. The frequency distribution table below shows the therapy type, gender, and age of individuals whose data is used in this study.

Table 1

*Key Demographics of Sample (N = 103)*

Variable	N	%
Therapy type		
Medicine only	13	12.6
Individual counseling	27	26.2
Cognitive behavioral	28	27.2
Combination	35	34.0
Sex		
Male	73	70.9
Female	30	29.1
Age <sup>a</sup>		
11	9	8.7
12	13	12.6
13	17	16.5
14	14	13.6
15	9	8.7
16	17	16.5
17	13	12.6
18	11	10.7

<sup>a</sup> Age:  $M = 14.5$ ,  $SD = 2.2$ , median = 14

With the sample size of  $N = 103$ , 70.9% were male while 29.1% were female, 8.7% were 11 years old, 12.6% were 12 years old, 16.5% were 13 years old, 13.6% were 14 years old, 8.7% were 15 years old, 16.5% were 16 years old, 12.6% were 17 years old, and 10.7% were 18 years old.

Those within this varying range of ages and gender had different treatment types as well. It was reported that 12.6% were being treated with medicine alone, 26.2% were reported to be using individual counseling, 27.2% reported to be treated with cognitive

behavioral treatment, leaving the remaining 34.0% reporting a combined treatment approach.

Table 2 presents descriptive statistics for the key quantitative study variables. All variables were within normal distribution parameters and had sufficient variance for statistical analysis.

Table 2

*Descriptive Statistics for Quantitative Study Variables (N = 103)*

Variable	M (SD)	Mdn.	Skewness	Kurtosis	Min.	Max.
GPA	2.81 (0.59)	2.80	-0.14	-0.75	1.30	3.90
#Referrals	3.38 (1.14)	2.00	1.72	2.40	0.00	21.00
# Referral categories	2.19 (2.19)	2.00	0.69	-0.66	0.00	7.00
BASC-2 subscales						
Externalizing	66.04 (20.06)	63.00	0.00	-1.13	25.00	99.00
Internalizing	64.87 (17.74)	65.00	-0.03	-0.80	27.00	99.00
School problems	64.17 (19.20)	62.00	0.14	-1.07	31.00	100.00
Behavioral	69.66 (18.69)	71.00	-0.14	-1.10	35.00	100.00
Adaptive	66.79 (19.27)	67.00	-0.09	-1.11	33.00	99.00

### Screening of Sex and Age as Potential Covariates

Age and GPA were not statistically significantly correlated,  $r(101) = -.121, p = .222$ . GPA for males ( $M = 2.82, SD = .63$ ) and female GPA ( $M = 2.81, SD = .50$ ) did not significantly differ,  $F(1, 101) = 0.002, p = .965$ .

The four therapy types did not significantly differ by age,  $F(1, 99) = 0.336, p = .799$ . Mean age and standard deviation for each were: (a) medicine only, 14.00 (2.35); (b) individual counseling, 14.74 (2.05); (c) cognitive behavioral, 14.57 (2.44); and (d) combination, 14.57 (2.09). The proportion of males and females were not different than statistically expected,  $\chi^2(3, N = 103) = 0.958, p = .811$ .

Total number of disciplinary referrals was not significantly correlated with age,  $r(101) = .118, p = .236$ . Also, the total did not significantly differ between males ( $M = 2.96, SD = 4.21$ ) and females ( $M = 4.4, SD = 4.85$ ),  $F(1, 101) = 2.28, p = .135$ .

Age was not statistically significantly correlated with any of the five BASC subscale scores, though age and behavioral scores approached significance,  $r(101) = -.180, p = .069$ , suggesting that as age increases, behavioral scores decrease. Male and female differences on each of the five BASC subscale scores are presented in Table 3. Males and females did not statistically significantly differ on any of the five BASC subscale scores.

Table 3

*Differences in BASC Subscale Scores by Males and Females (N = 103)*

BASC subscale	Male <i>M (SD)</i>	Female <i>M (SD)</i>	<i>p</i>	$\eta^2$
Externalizing	64.97 (20.87)	68.63 (18.01)	.403	.007
Internalizing	66.15 (18.21)	61.77 (16.41)	.257	.013
School	66.01 (18.91)	59.70 (19.48)	.130	.023
Behavioral	69.33 (17.89)	70.47 (20.81)	.780	.001
Adaptive	67.74 (18.50)	64.47 (21.19)	.436	.006

Because age and sex were not related to the key study variables, they were not potential confounds in interpreting the results of the inferential analyses that follow.

### Inferential Analysis

#### Relationship Between Therapy Type and GPA

RQ1: What is the extent of differences in GPA across types of ADHD therapy?

Null hypothesis 1: There is no difference in GPA by any pairwise comparison of ADHD therapy type.

As detailed in Table 4, GPA did not statistically differ for any of the six pairwise comparisons of therapy type. The null hypothesis was not rejected.

Table 4

*Pairwise Comparisons of GPA by Type of Therapy*

Therapy type	GPA <i>M (SD)</i>	Significance ( <i>p</i> ) of pairwise comparisons		
		2	3	4
1. Medicine only	2.72 (.60)	.999	.999	.423
2. Individual counseling	2.69 (.63)		.987	.154
3. Cognitive behavioral	2.74 (.53)			.285
4. Combination	3.01 (.59)			

### Relationship Between Therapy Type and BASC-2 Subscales

RQ2: What is the extent of differences in each of the five BASC-2 subscale scores across types of ADHD therapy?

Null hypothesis 2a: There is no difference in the BASC-2 TRS externalizing behavior subscale score by any pairwise comparison of ADHD therapy type.

As shown in Table 5, none of the pairwise comparisons were statistically significant. The null hypothesis is retained; the four therapy types did not differ on the BASC externalizing subscale score.

Table 5

*Pairwise Comparisons of BASC Externalizing Scores by Type of Therapy*

Therapy type	Externalizing <i>M (SD)</i>	Significance ( <i>p</i> ) of pairwise comparisons		
		2	3	4
1. Medicine only	73.46 (19.1)	.844	.506	.418
2. Individual counseling	67.89 (20.4)		.895	.822
3. Cognitive behavioral	64.07 (18.6)			.999
4. Combination	63.43 (21.3)			

Null hypothesis 2b: There is no difference in the BASC-2 TRS internalizing behavior subscale score by any pairwise comparison of ADHD therapy type.

As shown in Table 6, two of the pairwise comparisons were statistically significant. The null hypothesis is rejected. The medicine only group had higher BASC internalizing subscale scores than the combination therapy group, and the cognitive behavioral group had higher scores than the combination therapy group.

Table 6

*Pairwise Comparisons of BASC Internalizing Scores by Type of Therapy*

Therapy type	Internalizing <i>M (SD)</i>	Significance ( <i>p</i> ) of pairwise comparisons		
		2	3	4
1. Medicine only	73.23 (14.5)	.304	.965	.046
2. Individual counseling	63.15 (16.0)		.381	.722
3. Cognitive behavioral	70.54 (19.8)			.034
4. Combination	58.57 (16.3)			

Null hypothesis 2c: There is no difference in the BASC-2 TRS general behavior subscale score by any pairwise comparison of ADHD therapy type.

As shown in Table 7, none of the pairwise comparisons were statistically significant. The null hypothesis is retained; the four therapy types did not differ on the BASC general school problems subscale score.

Table 7

*Pairwise Comparisons of BASC General School Problems Scores by Type of Therapy*

Therapy type	School Problems <i>M (SD)</i>	Significance ( <i>p</i> ) of pairwise comparisons		
		2	3	4
1. Medicine only	67.08 (16.1)	.995	.999	.598
2. Individual counseling	65.52 (21.1)		.978	.587
3. Cognitive behavioral	67.61 (18.3)			.325
4. Combination	59.31 (19.2)			

Null hypothesis 2d: There is no difference in the BASC-2 TRS BSI subscale score by any pairwise comparison of ADHD therapy type.

As shown in Table 8, none of the pairwise comparisons were statistically significant. The null hypothesis is retained; the four therapy types did not differ on the BASC adaptive subscale score.

Table 8

*Pairwise Comparisons of BASC Adaptive Scores by Type of Therapy*

Therapy type	Adaptive <i>M (SD)</i>	Significance ( <i>p</i> ) of pairwise comparisons		
		2	3	4
1. Medicine only	73.15 (14.5)	.462	.888	.620
2. Individual counseling	63.59 (19.8)		.786	.979
3. Cognitive behavioral	68.46 (21.2)			.933
4. Combination	65.54 (18.8)			

Null hypothesis 2e: There is no difference in the BASC-2 Behavioral subscale score by any pairwise comparison of ADHD therapy type. As shown in Table 9, none of the pairwise comparisons were statistically significant. The null hypothesis is retained; the four therapy types did not differ on the BASC behavioral subscale score.

Table 9

*Pairwise Comparisons of BASC Behavioral Scores by Type of Therapy*

Therapy type	Behavioral <i>M (SD)</i>	Significance ( <i>p</i> ) of pairwise comparisons		
		2	3	4
1. Medicine only	77.00 (18.0)	.260	.710	.624
2. Individual counseling	65.41 (18.4)		.763	.807
3. Cognitive behavioral	70.32 (18.8)			.999
4. Combination	69.69 (18.9)			

**Relationship Between Therapy Type and Office Discipline Referral (ODR) Type**

RQ3: What is the extent of association between types of ADHD therapy and ODR type?

Null hypothesis 3: Type of ADHD therapy and ODR type are independent.

The archival data included referral information across 12 distinct categories (the %-value represents the percentage of cases without the specific type of referral):

1. Defiance (80.6%)
2. Aggression (65.0%)
3. Lack of accountability (90.3%)
4. Lying (85.4%)
5. Irrational behavior (89.3%)
6. Angry outburst (77.7%)
7. Anxiety (78.6%)
8. Depression (85.4%)
9. Attention (77.7%)
10. Learning difficulty (85.4%)
11. Withdrawn (82.5%)
12. Study skills (82.5%)

Because each specific type had a very large proportion of cases that had not had such a discipline referral, a crosstabulation with therapy type and chi square analysis was invalid. A count of number of referral types was calculated for each case. Because there were 12 referral types, the maximum possible value was 12. Table 10 presents a frequency distribution.

Table 10

*Distribution of Number of Discipline Referral Types (N = 103)*

# of Referral categories	N	%
0.00	36	35.0
1.00	11	10.7
2.00	14	13.6
3.00	17	16.5
4.00	5	4.9
5.00	9	8.7
6.00	6	5.8
7.00	5	4.9

Because of the re-operationalization, the research question and null hypothesis was modified.

Modified RQ3: What is the extent of differences in the number of discipline referral types across types of ADHD therapy?

Modified *null hypothesis 3*: There is no difference in the number of discipline referral types by any pairwise comparison of ADHD therapy type.

An ANOVA was used to test the null hypothesis and answer the research question. As shown in Table 11, one of the pairwise comparisons was statistically significantly different, and another approached significance. The combination therapy

group had a lower number of referral types than the cognitive behavior and medicine only therapy groups.

Table 11

*Pairwise Comparisons of Disciplinary Referrals by Type of Therapy*

Therapy type	Referrals <i>M (SD)</i>	Significance ( <i>p</i> ) of pairwise comparisons		
		2	3	4
1. Medicine only	2.85 (2.0)	.884	.993	.069
2. Individual counseling	2.33 (2.3)		.595	.135
3. Cognitive behavioral	3.04 (2.5)			.003
4. Combination	1.17 (1.5)			

### **Relationship Between GPA and Total Number of ODRs**

RQ4: What is the extent of correlation between GPA and number of discipline referrals?

Null hypothesis 4: GPA and total number of referrals are not correlated.

The correlation between GPA and total number of discipline referrals approached statistical significance,  $r(101) = -.187, p = .058$ . GPA and total number of disciplinary referrals were inversely related; as the number of discipline referrals increased, GPA tended to decrease.

### **Exploratory Regression Models**

RQ5: Using total number of ODRs, therapy type, and the five BASC-2 TRS subscale scores, what is the best set of predictors accounting for variance in GPA?

In a stepwise regression, the only predictor to enter was total number of discipline referrals, replicating the statistical results for research question 4, but providing some additional interpretive information. The simple regression equation was as follows:

$$\text{GPA}' = 2.899 - .025\text{referrals}$$

For each discipline referral, GPA was predicted to decrease by .025 points. For example, GPA for those with no referrals was predicted to be 2.899, 2.774 for those with 5 referrals, 2.649 for those with 10 referrals, and so on.

RQ6: Using GPA, therapy type, and the five BASC-2 TRS subscale scores, what is the best set of predictors accounting for variance in total number of ODRs?

In a stepwise regression, three statistically significant variables predicted total number of discipline referrals,  $F(3, 99) = 5.13, p = .002, R = .367$ , accounting for 13.4% of the variance in total number of referrals (a medium size effect). The resulting regression equation was as follows, in which CB = cognitive behavior therapy group, M = medicine only therapy group and Behavioral = BASC-2 behavioral subscale score:

$$\#\text{Referrals}' = 5.885 + 2.773\text{CB} + 3.159\text{M} - .053\text{Behavioral}$$

Referrals were predicted to increase for those in the cognitive behavior or medicine only therapy groups compared to the combination therapy group, and predicted to decrease as BASC-2 behavioral subscale scores increased.

### **Summary**

This chapter was a statistical presentation of the data collected in this research study. With the focus here was on behaviors that influenced social and academic performances; the results of the statistical analysis were clear.

The number of disciplinary referrals was not correlated with age and did not differ between males and females. Age was not statistically significantly correlated with any of the BASC subscale scores in this study. Age of the individual and behavioral scores did however approach significance suggesting that as age increased, behavioral scores decrease. It was found that the four therapy types examined here did not differ on the BASC externalizing subscale score. The results did show that those individuals who reported using medicine only had higher BASC internalizing subscale scores than the combination therapy group of individuals. With even higher BASC internalizing subscale scores were individuals reporting the use of the cognitive behavioral therapy. With the general school problems subscale score, the four therapy types did not differ. There were found no difference with the BASC adaptive or behavioral subscale scores among the four therapy types as well. When looking at the behavior referrals it was presented in twelve categories of infractions. The group of individuals reporting the use of a combined treatment had a lower number of referral types than group reporting the cognitive behavior therapy and that reporting medicine use only. GPA in relation to referrals approached statistical significance showing an inverse relationship, as the number of referrals increased the GPA decreased.

Chapter 5 will address the significance and context of these findings as well as their interpretation. The next chapter will also include social change implications, recommendations for actions, and possibilities for future research.

## Chapter 5: Discussion, Conclusions, and Recommendations

### **Introduction**

The purpose of this study was to gain a better understanding of the treatment designs and outcomes of those affected by ADHD. Through this understanding there will be an increase in the awareness of those treatment methods used for the most effective and efficient results. In the course of identification of the most successful treatments available those people responsible for the care of those diagnosed with ADHD will be better enabled to make an informed decision on the direction of treatment.

This study examined the treatment methods used for students diagnosed with ADHD. It looked at the different treatment types in regard to the extent of differences in GPA across the different types. This study also looked at the relationship between treatment type and subscale scores on the BASC-2. The extent of association between types of ADHD treatment and the type of office discipline referral was examined. The total number of office discipline referrals was looked at to see the extent of correlation with the GPA.

Exploratory regression models were used to identify the best set of predictors accounting for variance in GPA using the total number of ODR's, treatment type, and the five BASC-2 TRS subscale scores. Multiple linear regression procedures were used to explore the combined and relative effects of the best set of statistically significant predictors of GPA. Using GPA, treatment type, and the five BASC-2 subscale scores the best set of predictors accounting for variance in total numbers of ODR's was explored.

Mongia (2012) stated that (CBT) leads to a reduction in those expressed behaviors identified with ADHD. This study showed none of the pairwise comparisons were statistically significant. The four therapy types did not differ on the BASC general school problems subscale score. The four therapy types did not differ on the BASC adaptive subscale score. The four therapy types did not differ on the BASC behavioral subscale score examined in this study.

Barkley (2010) stated that ADHD is the most treatable psychiatric disorder and yet there is no single treatment method that works equally with everyone dealing with it. . As Ramos (2013) reported on the association between ADHD symptoms combined with social competence with individual cognitive status the social and academic performances were studied here.

The findings of this study indicated that overall the four therapy types did not significantly differ by age, the proportion of males and females were not different than statistically expected, and the total number of disciplinary referrals was not significantly correlated with age.

### **Interpretation of Findings**

Notwithstanding the extensive research available in the many areas of attention disorders, additional studies need to be done and research published to more closely examine what specific treatment approaches have been used in the treatment of those individuals with ADHD. Despite the amounts of data and research available on specific treatments of ADHD, the need for updated results and data would best assist those responsible for the treatment make the best informed decisions.

Medication has been the most common and effective in treating symptoms of ADHD (Barkley, 2010). Medication allows for people to become less likely to be distracted increasing the effectiveness of additional treatment methods (Fleming, 2012). This study shows additional data should be used when making the decision of treatment. The combined treatment approaches available for treating ADHD are ever changing and the results of this study can be used to further the discussion with providers.

Mental and emotional well-being can be affected by the symptoms of ADHD (Barkley, 2010). The results of this study will further enhance the treatment opportunities for other mental health treatments as well. ADHD, if left untreated into adulthood, can lead to greater inattention and even forgetfulness to the point of negatively affecting career and personal relationships (Fleming, 2012). Gaining better control over these ADHD symptoms can lead to behavior management strategies that allow for an increased use of the individual intellectual and creative potentials (Barkley, 2010). Executive function skills are the self-regulating abilities that people with ADHD are lacking (Barkley, 2000). These skills are used every day to plan ahead, stay organized, solve problems, and focus on what is important (Barkley, 2000). Through this study and the use of the BASC-2 it can be seen how lacking these skills directly contributes to academic and social performances.

The four therapy types, (a) medicine only, (b) individual counseling, (c) cognitive behavioral, and (d) combination therapy, did not significantly differ by age. The total number of referrals was not significantly correlated with age or between genders. The five BASC-2 subscale scores were not significantly correlated with age but age and

behavioral scores approached significance. This would suggest that as age increased the behavioral scores decreased. Males and females did not significantly differ on any of the BASC-2 subscale scores.

In this study, the GPA was found to be highest in the population who participated in the combined treatment approaches for ADHD. The different treatment types however did not differ on the BASC-2 externalizing subscale scores. The medicine only group had higher BASC-2 internalizing subscale scores than the combination treatment group. The cognitive behavioral group had higher scores than the combination treatment group. The four treatment type groups did not differ on the BASC-2 general school problems, adaptive or behavioral subscale scores.

The combined treatment group had a lower number of referral types than the cognitive behavior and the medicine only treatment groups. As the total number of referrals increased the GPA was inversely related and decreased. This study suggests that it can be predicted that for each discipline referral, the GPA will decrease by 0.025 points. Referrals were predicted to increase for those in the cognitive behavioral and the medicine only treatment groups as compared to the combination treatment group. They are also predicted to decrease as BASC-2 subscale scores increased.

### **Limitations of the Study**

This study was limited by the amount of student data that were examined. The student data was from a limited area of New York State. Large cities as well as the more rural areas might have contributed additional variables that may have added depth to the study. This is being assumed after the study by Ramos (2013) where 457 children had

cognitive functions assessed at the age of four by psychologists, for inattention hyperactivity symptoms through the use of Diagnostic and Statistical Manual of Mental Disorders, and social competence through teacher reports.

In addition to these limitations, the archival nature of the data collected that had been collected for purposes other than this study. This lack of control over how the data was directly collected the level of care and consistency could not be measured. Lastly, the ability to detect any amount of errors to ensure the overall quality of the data is impossible. The control and use of the data in this study was maintained by this researcher. The observation of an individual is always critical in an accurate diagnosis, along with a medical history, performance tests, psychological tests, and tests in areas of functioning can increase the ability to make a better diagnosis leading to the best treatment methods. In this study the data were collected by professionals in the field of social work but were still influenced by their own perceptions.

### **Recommendations**

Based on the research presented in the results of this study, it does appear that the need for future research to identify the impacts of treatment methods on many variables. Future studies could be either qualitative or quantitative in nature to expand information on many of the involved variables.

Future studies could accomplish this through the use of parent, teacher, and student questionnaires to best examine all three perspectives. The use of qualitative methods like interviews can also add another dimension to the knowledge base that is made available. Through the acquisition of the many perspectives of those dealing with

ADHD, specific variables can be selected and further examined to see if they even contribute to the disorder.

### **Implications for Social Change**

ADHD can have a significant impact on the individual diagnosed, the friends and families of those affected, as well as the community as a whole. The costs in the educational and social arenas could be overwhelming. This study could result in positive social change through the increase in effectiveness of treatment methods. When treatment methods are found to be most effective and the individual diagnosed gains better control of their executive functions, the quality of life will increase. As quality of life increases for each individual affected by ADHD, the quality of the lives of those surrounding them also increases. The socio-economic class of these families also has the potential of changing as the number of those being productive in our community increases.

This study will also have a significant impact as well as contribution to the literature through an increased understanding and knowledge into how treatment types affect social and academic performances. This study will also contribute to the professional community in allowing additional resources for their use in both treating and diagnosing those expressing symptoms identifiable with ADHD. This would also contribute to interventions to be made available for those involved but especially in the academic environment. Through these quality of life improvements there can be found greater opportunities for successful completion of steps moving forward in both the social and academic arenas.

### **Theoretical Implications**

The Quay-Gray model of ADHD suggested that impulsivity found in ADHD arose from a lower functioning of the human brains behavioral inhibition system (Barkley, 1997). The Quay-Gray model is based on the idea that the human brain has two distinct systems; the behavioral inhibition system (BIS) and the behavioral activation system (BAS) as described earlier. It can be seen that the total number of referrals in this study as compared to the total number of referral types direct our attention to these two systems of the human brain. The types of referrals being made for the expressed behaviors of those showing symptoms of ADHD involve the lack of inhibition. The direct cause of this inhibition could not be found through this study because of the number of variables and lack of data to support or deny any suggestions.

The Unifying Theory of Attention Deficit Hyperactivity Disorder best explains the disorder. It is explained that this disorder is characterized by signs of distractedness, arousal, impulsivity, and hyperactivity. This study examined the expressed behavior that was in regard to each of these signs. The roles of the frontal cortex in the human brain are the executive: regulation of the mental skills necessary to sustain attention and lessen the influence of impulses on expressed behavior (Barkley, 2000). Drugs used in treatment usually are ones chosen to target this frontal area of the brain (Saylor, 2002). In targeting this area of the brain, the symptoms of ADHD are quelled.

### **Summary and Conclusion**

The current study used a quantitative approach in the analysis of data collected for purposes other than this study. The data were used to closely look at the social and

academic patterns of those students that were diagnosed with ADHD. The focus in this study was to see the benefits of treatment approaches, whatever they may have been. With the information generated from this study the scope of treatment options will be greater and many will have greater options. The current study was intended to fill a gap in research of students diagnosed with ADHD in rural areas of New York State.

Based on the results of this study, it would appear that the treatment type for ADHD or the methods used in treatment differ in a statistically insignificant manner. This study does suggest that students diagnosed with ADHD will struggle with behavior referrals involving expressed behavior identified with ADHD. This struggle was seen in the number of referrals and the GPA being inversely related to the number of episodes or documented behavior.

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## Appendix A: Data Use Agreements

**DATA USE AGREEMENT**

This Data Use Agreement (“Agreement”), effective as of 11/20/2015 (“Effective Date”), is entered into by and between Mark A. Russell (“Data Recipient”) and Westmoreland Central School District (“Data Provider”). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set (“LDS”) for use in research **in accord with laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient’s educational program.** In the case of a discrepancy among laws, the agreement shall follow whichever law is more strict.

**Definitions.** Due to the study’s affiliation with Laureate, a USA-based company, unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the USA “HIPAA Regulations” and/or “FERPA Regulations” codified in the United States Code of Federal Regulations, as amended from time to time.

**Preparation of the LDS.** Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient’s educational program.

**Data Fields in the LDS.** **No direct identifiers such as names may be included in the Limited Data Set (LDS).** In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: school GPA, attendance record (days absent, tardy, excused early), type and number of discipline referrals, BASC-2 results, diagnosis, treatment type(s), a blank office referral form, from students enrolled in your alternative education program.

**Responsibilities of Data Recipient.** Data Recipient agrees to:

Use or disclose the LDS only as permitted by this Agreement or as required by law;

Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or

disclosure of the LDS that apply to Data Recipient under this Agreement;  
and

Not use the information in the LDS to identify or contact the individuals who are data subjects.

**Permitted Uses and Disclosures of the LDS.** Data Recipient may use and/or disclose the LDS for its Research activities only.

**Term and Termination.**

**Term.** The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

**Termination by Data Recipient.** Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

**Termination by Data Provider.** Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

**For Breach.** Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

**Effect of Termination.** Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

**Miscellaneous.**

**Change in Law.** The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

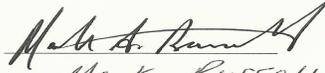
- d. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.
- e. Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

**DATA PROVIDER**

Signed:   
 Print Name: Rocco Migliori  
 Print Title: Superintendent of Schools

**DATA RECIPIENT**

Signed:   
 Print Name: Mark Russell  
 Print Title: Student

## DATA USE AGREEMENT

This Data Use Agreement (“Agreement”), effective as of 11/23/2015 (“Effective Date”), is entered into by and between Mark A. Russell (“Data Recipient”) and Esenell Choices Inc. (“Data Provider”). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set (“LDS”) for use in research **in accord with laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient’s educational program.** In the case of a discrepancy among laws, the agreement shall follow whichever law is more strict.

Definitions. Due to the study’s affiliation with Laureate, a USA-based company, unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the USA “HIPAA Regulations” and/or “FERPA Regulations” codified in the United States Code of Federal Regulations, as amended from time to time.

Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient’s educational program.

Data Fields in the LDS. **No direct identifiers such as names may be included in the Limited Data Set (LDS).** In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: school GPA, attendance record (days absent, tardy, excused early), type and number of discipline referrals, BASC-2 results, diagnosis, treatment type(s), a blank office referral form, from students enrolled in your alternative education program.

Responsibilities of Data Recipient. Data Recipient agrees to:

Use or disclose the LDS only as permitted by this Agreement or as required by law;

Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement;  
and

Not use the information in the LDS to identify or contact the individuals who are data subjects.

Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS **for its Research activities only.**

Term and Termination.

Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

Miscellaneous.

Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

d. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

e. Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

<b>DATA PROVIDER</b>	<b>DATA RECIPIENT</b>
Signed: <u>Brenda Esengard</u>	Signed: <u>Mark Russell</u>
Print Name: <u>Brenda Esengard</u>	Print Name: <u>Mark Russell</u>
Print Title: <u>Secretary, Board of Directors</u>	Title: <u>Principal Investigator</u>

## Appendix B: Office Discipline Referral Form

Behavioral Help by  
Teacher

Help me get started

Click on Search for student to fill  
in the student's ID and name.

Submit: New Discipline Referral

Many fields are  
auto-filledQuick entry  
of common  
itemsAdd photos  
or other files  
as needed

Problem Behavior	
<b>Student ID</b> Search for student	Finn999 <input type="button" value="Get Student Data"/> <input type="button" value="Show History"/> <input type="button" value="Show Notes"/>
<b>Student Name</b>	Huck <input type="text"/> Finn <input type="text"/>
<b>Grade</b>	12 <input type="button" value="View discipline history or teacher notes for behavior context"/>
<b>Special Ed</b>	No
<b>ESL/ELL</b>	No
<b>Event Date</b>	3/31/2016 8:57 am <input type="button" value="Now"/>
<b>Referring Teacher</b>	Arney, Mary <input type="button" value="v"/>
<b>Team</b>	<input type="text"/>
<b>Event Period</b>	<input type="radio"/> Before School <input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> After School
<b>Location</b>	Classroom <input type="button" value="v"/>
<b>Room or Bus Number</b>	<input type="text"/>
<b>Behavior Category</b>	Disruption <input type="button" value="v"/>
<b>Explanation of Behavior</b>	
<input type="text" value="Huck was talking loudly and would not attend to his work."/>	
<b>Intervention Used</b>	
<input type="checkbox"/> Alternate Activity <input checked="" type="checkbox"/> Changed student's seat <input type="checkbox"/> Conference with parent <input checked="" type="checkbox"/> Conference with student <input type="checkbox"/> Cooling off period <input type="checkbox"/> Phoned parent <input type="checkbox"/> Referral To Principal <input type="checkbox"/> Referred to counselor	
<input type="text" value="Conference with student"/> <input type="text" value="Changed student's seat"/>	
<input type="text"/>	Upload file of additional info: <input type="button" value="f"/>
<input type="text"/>	Upload file of additional info: <input type="button" value="f"/>
<input type="text"/>	Upload file of additional info: <input type="button" value="f"/>
<b>Comments</b> These comments are for internal use, not shared with parents or students.	
<input type="text"/>	
<input type="button" value="Submit"/>	<input type="button" value="Submit &amp; Enter New Incident"/>
<input type="button" value="Reset"/>	<input type="button" value="Submit and Assign Intervention"/>