Attention Deficit/Hyperactivity Disorder and Juvenile Delinquency: Will Treating the Effects of AD/HD Reduce Recidivism?

By

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Attention Deficit/Hyperactivity Disorder and Juvenile Delinquency:

Will Treating the Effects of AD/HD Reduce Recidivism?

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ABSTRACT

Attention Deficit/Hyperactivity Disorder (AD/HD) is a disease characterized by inattention, hyperactivity, and impulsivity. Research shows that these symptoms may lead a child to engage in delinquent behavior. This research project utilized secondary data to evaluate the effectiveness of a program that is currently diagnosing and treating juvenile delinquents for AD/HD, with the goal of reducing recidivism. During the evaluation process, the demographic characteristics, delinquent record, and school performance of each juvenile was reviewed and analyzed. Juveniles who successfully completed the program and juveniles who did not were compared. Data were also utilized to determine the type of juveniles in the program. The offenses that were committed by the juveniles in the program, and whether or not school performance improved after treatment of AD/HD symptoms were investigated. The research hypothesis was supported—the juveniles who successfully completed the program had significantly fewer arrests than the juveniles who did not complete the program. Most juveniles were referred to the program through the Court, and were not arrested immediately prior to joining the program. Juveniles who were arrested were most likely to be arrested and charged with domestic violence or for being unruly. In the future, the time length of the program could be expanded, more assessment of the juvenile could take place, and the effects of specific medications on the symptoms of AD/HD could be investigated.

DEDICATION

To all of those who have been such an integral part of my life, and to those who have been with me through all of my trials and tribulations.

I could not be where I am today without your help.

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Problem Statement

Prevalence of AD/HD

Approximately two to eight million school-age children are currently diagnosed with Attention Deficit/Hyperactivity Disorder (AD/HD) throughout the United States (Silver, 2004; Buttross, 2007; U.S. Census Bureau, 2000). Further, between 50% and 70% of these children will have their symptoms carry on through adulthood and permanently disrupt their lives if not treated (Buttross, 2007; Ahrens, Jr., 2007). This prevalence rate is similar all over the world, with estimates of 3-12% of children having the disorder (Biederman & Faraone, 2005).

What is even more disturbing is the number of *undiagnosed* cases of the disorder. As stated above, approximately two to eight million children in the United States have been diagnosed with AD/HD, which equates to between 3% and 10% of all (U.S.) children (Silver, 2004; Buttross, 2007). This brings about the question of how many more children in the nation have *not* been formally diagnosed, and are living with the symptoms of AD/HD. One particular study utilized data from the National Health and Nutrition Examination Survey (2001-2004), which was designed to investigate the presence of AD/HD in a nationally representative sample of children ages 8 to 15 years old. A total of 3,082 children completed the entire survey (roughly 79% of the total sample). Results from the survey indicated that 8.7% of the total sample met AD/HD criteria from the Diagnostic and Statistical Manual, Fourth Edition-Text Revision (DSM-

IV-TR). Of those children, less than half (47.9%) were actually diagnosed with AD/HD (Froehlich, Lanphear, Epstein, Barbaresi, Katusic, & Kahn, 2007). Thus, almost 130 children out of the sample were living with the disorder and were not receiving treatment. This may represent just a fraction of the total number of untreated children with AD/HD. Untreated AD/HD can have many negative consequences. These consequences are discussed at a later time in this study.

Diagnosis of AD/HD

AD/HD is a disorder characterized by three main symptoms: inattention, hyperactivity, and impulsivity. These symptoms must have been presented prior to age seven, and they must be pervasive, being exhibited in all environments of the individual's life. (The full diagnostic criterion is discussed in Chapter Two.) A person with AD/HD may have trouble focusing on one task for a long amount of time (inattention); they may be very restless or have difficulty sitting still (hyperactivity); or they may act without contemplating the long-term consequences of their behavior (impulsivity) (DSM-IV-TR, 2000; Buttross, 2007). Individuals with AD/HD do not have to experience or display all three symptoms. There are actually three subtypes of AD/HD, with a particular symptom being the most pronounced. They are: the Combined Type; the Primarily Hyperactive/Impulsive Type; and the Primarily Inattentive Type, which has been found to be the most common (DSM-IV-TR, 2000; Froehlich, Lanphear, Epstein, Barbaresi, Katusic, & Kahn, 2007).

This disorder is mainly known as a childhood disorder, but due to increased recognition and modes of treatment, an increasing number of adults are being diagnosed. Adults with AD/HD experience the same three symptoms as children, but inattention is more pronounced than both impulsivity and hyperactivity (Doyle, 2006). Adults usually learn to suppress their hyperactive and impulsive symptoms, so they mainly experience the inattentive subtype of AD/HD. AD/HD in adults may be manifested as difficulty with staying organized and on-task, difficulty with developing and maintaining personal relationships, and excessive restlessness (Children and Adults with Attention Deficit/Hyperactivity Disorder (CHADD), 2009). If symptoms are not treated in childhood, they may persist into adulthood. How the symptoms present themselves may change, but the actual symptoms will most likely remain.

Possible Consequences of AD/HD

AD/HD has been associated with a number of negative life experiences. For example, adolescents with AD/HD are more likely to experience comorbidity with other disorders, including mood and anxiety disorders, substance abuse (discussed below), and learning disabilities/disorders (Buttross, 2007; Biederman, Newcomb, & Sprich, 1991). In fact, it has been estimated that anywhere from 30% to 70% of children with AD/HD also have a learning disability (Andries, 2006; Mayes, Calhoun, Crowell, 2000). This comorbidity has tremendous implications for the proper diagnosis and treatment of both learning disabilities and AD/HD. Medical and/or psychiatric professionals need to

establish what problem needs to be addressed first. Sometimes it may be necessary to treat the learning disorder before treating the AD/HD, or vice versa.

In addition, many times the AD/HD symptoms and learning disabilities overlap, and it is very hard to determine if the problem is caused by behavioral or cognitive deficiencies (i.e., which symptom is coming from what deficiency, AD/HD or a learning disability) (Riccio, Gonzalez, & Hynd, 1994). For example, a doctor may be treating a child for AD/HD with medication, when in fact the presenting problem is caused by the child's inability to process certain letters of the alphabet, instead of being caused by the child's inability to focus or his/her hyperactivity. As one can see, symptom overlap and comorbidity make proper treatment and diagnosis of AD/HD crucial, especially if the symptoms (and their presenting problems) will continue into adulthood.

Along with AD/HD, learning disabilities have also been correlated with juvenile delinquency, and juvenile delinquency has been associated with AD/HD (Bartol & Bartol, 2009). For the purposes of this study, a juvenile is an individual under the age of 18 years old. Juvenile delinquency is defined as "an act committed by a minor that violates the penal code of the government with authority over the area in which the act occurs (Schmalleger & Bartollas, 2008). There has been some debate as to the actual relationship between learning disabilities and juvenile delinquency over the past four decades. Much of the debate has centered on how "learning disabilities" have been defined throughout literature, the methodology employed in the studies, and the types of delinquent behavior researched (more serious versus less serious types of behavior) (Skaret & Wilgosh, 1989). Murray (1976) discussed a number of conflicting studies, reporting evidence both supporting and not supporting the relationship between learning

disabilities and juvenile delinquency. Lane (1980) found no clear evidence of this relationship after examining the literature, but others have found support. For example, Keilitz and Dunivant (1986) stated that while learning disabilities/disorders may not be the only cause of juvenile delinquency, there is an existing relationship.

Adolescents with AD/HD are also more likely to experience poor school achievement (Buttross, 2007; Mikami & Hinshaw, 2006). For instance, an AD/HD child may have trouble completing the required class work because of his/her inability to focus on the teacher or assignment. His/her hyperactivity may prohibit them from sitting still long enough to finish the work (i.e., they cannot sit at a desk for a long duration of time listening to the teacher or completing class work). Finally, the adolescent's level of impulsivity may lead to him/her (the adolescent) getting removed from the classroom, which also prohibits him/her from completing his/her class assignments. For example, an impulsive child may frequently talk out of turn or interrupt the teacher, causing the teacher to become upset and frustrated with the child. The result of this constant frustration may be the removal of the child from the classroom. This may solve the issue for the teacher, but it only magnifies the problem for the child because he/she has now missed out on whatever work is completed in the classroom. If the adolescent is not treated for the disorder, it may eventually lead to the child failing or being held back a grade level.

Poor school achievement may then lead to the adolescent being rejected by his/her peers. This peer rejection has also been associated with AD/HD. Other children may notice how poorly the child does in school, or how often the child gets removed the classroom. (Who wants to be friends with the "bad kid" in class?) Classmates may also

notice how he/she interrupts others and does not pay attention to the thoughts and feelings of other people. This type of behavior may then cause the child to get rejected by others (peer rejection), which again has been associated with AD/HD (Bartol & Bartol, 2009; Mikami & Hinshaw, 2006).

After the adolescent is physically and socially snubbed by classmates, he/she may begin engaging in delinquent behavior (Bartol & Bartol, 2009). This delinquent behavior may come about because the child is seeking attention from others. What better way to garner attention (even *bad* attention) then to commit a crime, especially a crime that may be looked upon by others as extremely dangerous (such as committing armed robbery)? Another way delinquency could result from peer rejection is by the outcaste adolescent taking refuge in a delinquent group of peers who have also been rejected (Bartol & Bartol, 2009). Even if the adolescent has no prior delinquent behavior, delinquency may result anyway because the individual is looking for some way to fit into the group. The intrinsic benefits from joining the group may outweigh any apprehensions the adolescent has about engaging in criminal behavior.

Substance abuse and AD/HD is another subject that has aroused debate in the research community. The majority of studies have found a relationship between AD/HD and substance abuse, but there are some who report no evidence of an association. One particular study investigated whether or not AD/HD was a risk factor for substance abuse. One hundred forty children with AD/HD and 120 without AD/HD were followed for four years to track psychoactive substance abuse. Results of the study showed that there were no differences between children with AD/HD and those without in terms of psychoactive substance use; both groups had a 15% use rate (Biederman, Wilens, Mick, Faraone,

Weber, Curtis, Thornell, Pfister, Jetton, & Soriano, 2003). However, other studies have found that adolescents with AD/HD are more likely to use drugs, including alcohol, tobacco, and illicit drugs (Bartol & Bartol, 2009; Quinn, 2005; Molina & Pelham, 2003).

There appears to be a pattern in the research: poor school achievement can lead to peer rejection, which can then lead to juvenile delinquency and substance abuse. Thus, millions of children (not to mention, the adults who are now being diagnosed) may be experiencing symptoms of AD/HD, and may be engaging in maladaptive behavior (Bartol & Bartol, 2009; Buttross, 2007; Quinn, 2005). This knowledge alone should be reason enough to research the topic of AD/HD and juvenile delinquency. Perhaps if the symptoms of AD/HD are eliminated, or at the very least drastically reduced, adolescents will be less likely to engage in maladaptive or delinquent behavior.

Current Research Project

The purpose of this research was to evaluate the link between AD/HD and juvenile delinquency; in particular, this research evaluated the effectiveness of the AD/HD Program in treating the symptoms of the disorder and hopefully reducing juvenile delinquency. The treatment of AD/HD to decrease juvenile delinquency is important because, without dealing with the juvenile delinquency (i.e., treating AD/HD symptoms), that child may become an *adult* criminal. Babinski et al. (1999) found that hyperactivity and impulsivity—both symptoms of AD/HD—were predictors of criminality in adulthood. Thus, without treating the juvenile delinquent, especially for the symptoms mentioned above, the child may become an adult criminal.

The particular issue researched was the following: how effective is an AD/HD program (with AD/HD testing and treatment with medication) in reducing juvenile delinquency? This research question was chosen because of the link, described above, between AD/HD and juvenile delinquency, and the fact that juvenile delinquency was found to be a predictor of criminality in adulthood (Babinski, Hartsough, & Lambert, 1999). There are many different types of programs and methods used to treat AD/HD. This research focused on a method which requires the use of medication. Medication, in particular stimulant medication, is the most common treatment modality being used today (Shriner, 2007). Treating AD/HD with stimulant medication has been found to the most effective avenue of treatment, even when compared to multi-modal treatments (like behavioral modification with stimulant medication) (MTA Cooperative Group, 2004).

This study utilized secondary data analysis to examine information that was collected throughout the duration of a program being used by a county-level juvenile court. In particular, demographical data was employed to determine the characteristics of the juveniles in the program, such as their age, race, gender, and location where they live. Comparative statistics were also utilized to compare those who did and did not complete the program, and those who did and did not recidivate.

Summary

AD/HD is a disorder that affects millions of children throughout the United States, and if not treated, can continue into adulthood. With the number of suspected undiagnosed cases of AD/HD, it is no wonder that more and more adults are being diagnosed with the disorder, adults that have lived with their undiagnosed AD/HD all of

their lives. What makes treating this disorder in childhood so important are the consequences: AD/HD may lead to poor school achievement, juvenile delinquency, and substance abuse. Further, if symptoms are left untreated, these difficulties will only magnify as an adult. Adults with AD/HD may experience job failure, difficulty with organization and completing job tasks, and forgetfulness, among others (Children and Adults with Attention Deficit/Hyperactivity Disorder (CHADD), 2009). Thus, it is imperative to diagnose and treat the disorder in childhood in order to avoid the array of negative consequences for both children and adults. This research project examines the effectiveness of an AD/HD treatment program that utilized medication as its primary mode of treatment.

The following chapter contains an in-depth discussion of AD/HD. Diagnostic criteria from the DSM-IV-TR are described, including the various subtypes. In addition, the many treatment methods of AD/HD are reviewed, along with the implications of the disorder. The hypothesis and research questions of this research project are also presented.

Chapter 2

Literature Review

AD/HD is a childhood disorder characterized by three main symptoms: inattention, hyperactivity, and impulsivity. A person with this disorder may have trouble attending to stimuli for a long period of time; they may be hyperactive or restless; or they may engage in behavior without considering the consequences. Individuals with AD/HD do not have to experience all three of these symptoms to be diagnosed with the disorder. They can have just one or two, or even all three of the symptoms. AD/HD is known as a childhood disorder, but a greater number of adults are now being diagnosed. The main treatment modality utilized for individuals with AD/HD is stimulant medication, although behavior modification therapy is also utilized. (The full diagnostic criteria and treatment for AD/HD are discussed below.)

The origin and evolution of AD/HD can be traced through the Diagnostic and Statistical Manual of Mental Disorders, published by the American Psychiatric Association. Hyperactivity was first described in the Diagnostic and Statistical Manual-Second Edition (DSM-II), published in 1968, and Attention Deficit Disorder (ADD, similar to AD/HD) was introduced in the third edition in 1980. It was not until the DSM-III, revised edition in 1987, however, that AD/HD was described. The full diagnostic criteria used today by clinical professionals can be found in the DSM-IV-TR (the criteria for AD/HD were expanded in 1991), published in 2000 (Southall, 2007).

AD/HD: Background

Approximately 3-10% of all school-age children (two to eight million children) are currently diagnosed with AD/HD in the United States (Silver, 2004; Buttross, 2007; U.S. Census Bureau, 2000). One of the reasons that AD/HD may be so common in the United States (and possibly the rest of the world) could be the result of genetics: it is considered to be one of the most common and heritable disorders. Heritability has been estimated anywhere from 64% to 80% (Goldstein & Kennemer, 2009; Rietveld, Hudziak, Bartels, van Beijsterveldt, & Boomsma, 2004). Evidence for the genetic transmission of AD/HD comes from research with monozygotic and dizygotic twins. If AD/HD was *not* genetic, then monozygotic twins, who share 100% of their genes, would not have concordance of the disorder. (Concordance in a set of twins occurs when both individuals have the disorder.) The concordance rate between dizygotic twins was 30%, and it was 51% with monozygotic twins (Goodman & Stevenson, 1989). These percentages represent a modest concordance rate.

Rietveld et al. (2004) investigated the heritability of problems with attention and over-active behavior in a sample of same-sex twin pairs. The sample was taken from the Netherlands Twin Registry, maintained at the Vrije Universiteit in Amsterdam. Parents completed the Child Behavior Checklist for each twin in the pair at ages 3, 7, 10, and 12 years of age. The checklist documented the "frequency and intensity" of emotional and behavioral problems during the past six months, from 1986 through 1993 (Rietveld et al., 2004, p. 578). The questionnaires were categorized into monozygotic and dizygotic twin pairs, with the following number of questionnaires at each age group collected: 3 years—

11,679 questionnaires; 7 years—10, 414 questionnaires; 10 years—6,026 questionnaires; and 12 years—3,033 questionnaires.

Descriptive statistics were calculated to examine the mean gender differences and differences across the various age groups. Likelihood-ratio and chi-square tests were applied, as well as the general linear model with repeated measures to assess nonparticipation. (Not all parents returned checklists for the twin pairs at each age.) Rietveld et al. (2004) also constructed a number of genetic models to measure phenotypic variance, which was "the sum genetic and environmental variances" (p. 580). These models were assessed on their plausibility and goodness-of-fit.

According to the results, the overall participation rate of the study was very high (approximately 80% for all age groups). The genetic heritability for overactive behavior and attention problems was roughly 75%, with environmental influence being measured near 25%. Monozygotic twin pairs had a higher degree of covariance than dizygotic twin pairs, and boys had more behavioral and attention problems than girls at every age. Both boys and girls had comparable degrees of symptom stability. For example, if a child does not have attention problems at age three, it is unlikely that he/she will develop attention problems at a later age. Overall, the authors concluded that genetics account for the majority of individual differences in overactive behavior and attention problems, while environmental influences account for only a small amount.

Causes of AD/HD

There is currently no single definitive cause for AD/HD. Research has found a number of possibilities, which are discussed below. It has even been proposed in literature that there may not be just one cause—there could be multiple factors at work with AD/HD. At one time, there were many speculations throughout popular media that an individual's diet caused symptoms of AD/HD. The blame of AD/HD was then placed on many frustrated parents, particularly mothers, who tried to change the eating habits of their children to decrease the symptoms of the disorder. Fortunately, many research studies have shown the AD/HD-diet theory to be wrong (Biederman & Faraone, 2005; Conners, 1980), although there are still AD/HD websites and literature that cite diet as one of the causes of AD/HD symptoms. For example, one website stated that simply removing certain types of foods from a child's diet may reduce or eliminate the AD/HD symptoms altogether, a fact that has been refuted by research (National ADHD Cure, 2008; Biederman & Faraone, 2005). Due to the ever-increasing AD/HD research literature, many causes, other than the "AD/HD diet" have been implicated.

As previously stated, research shows that one of the causes of AD/HD is genetics, with heritability estimated to be anywhere from 64% to 80% of the reason for the disorder; this includes both dizygotic and monozygotic twin pairs (Goodman & Stevenson, 1989; Rietveld, Hudziak, Bartels, van Beijsterveldt, & Boomsma, 2004). Therefore, there are many instances where both individuals in identical twin pairs and fraternal twin pairs (who share only 50% of their genes, such as with non-twin siblings) have symptoms of AD/HD (Khan & Faraone, 2006).

In addition, one study found that children who have a parent with AD/HD were more than four times as likely as children without an AD/HD-parent to have inherited the disorder (Buttross, 2007). One major gene or genomic region has not been found to be the leading cause of AD/HD, but studies have found that there may be certain variations of genes that may affect a person's susceptibility to AD/HD. For example, the dopamine D4 receptor and the serotonin transporter gene variations have been found in individuals with AD/HD (Biederman & Faraone, 2005). Based on this research, it can be concluded that genetics may account for a moderate portion of the variation in the causes of AD/HD.

Genetics, however, cannot be the only cause of AD/HD, as seen in results from twin studies. There have been monozygotic twin pairs where only one of the twins has AD/HD, and because monozygotic twins share 100% of their genetic information, there has to be other causes of AD/HD. If AD/HD was only due to genetics, both twins in a monozygotic twin pair would have symptoms of the disorder. This is not always the case, as there is a less than a 100% concordance rate.

Another possible cause for AD/HD is pre/postnatal maternal cigarette smoking. Linnet, Dalsgaard, Obel, Wisborg, Henriksen, Rodriquez Kotimaa, Moilanen, Thomsen, Olsen, & Jarvelin (2003) completed a literature review of studies pertaining to maternal risk factors and the effects of those risk factors on the development of AD/HD. They found that both human and animal studies have shown that nicotine exposure in utero may lead to hyperactivity, and this hyperactivity may be long-lasting. Many studies reported that maternal cigarette smoking was significantly associated with externalizing behaviors and attention problems.

Further, even after controlling for maternal AD/HD, children whose mothers had engaged in prenatal smoking were four times as likely to develop the disorder as children whose mothers did not smoke. Similar results have been found for postnatal maternal cigarette smoking. It should be noted here that not all studies in the review found an association between maternal cigarette smoking; one study in particular did not find pre/postnatal smoking to have any effect on the development of AD/HD symptoms in a large sample of children. Others found postnatal smoking, but not prenatal smoking, to have an effect on AD/HD symptoms (Cornelius, Ryan, Day, Goldschmidt, & Willford, 2001; Ferguson, Horwood, & Lynskey, 1993, as cited in Linnet et al., 2003). Overall, the majority of research investigating maternal cigarette smoking reported a significant association between smoking and the development of AD/HD symptoms.

Maternal alcohol consumption and abuse has also been associated with AD/HD symptoms. Like maternal cigarette smoking, studies examining alcohol consumption and AD/HD produced varied results, but the general consensus was the existence of a significant association between alcohol consumption and AD/HD. This relationship held even after controlling for factors such as maternal cigarette smoking, caffeine intake, and socioeconomic status. Mick, Biederman, Faraone, Sayer, & Kleinman (2002, as cited in Linnet et al., 2003) found that twice as many AD/HD children as non-AD/HD children had mothers who either had binged alcohol during pregnancy or drank alcohol daily. These results, however, were not replicated by other researchers.

Caffeine intake during pregnancy has also been suggested as a possible cause of AD/HD, although little-to-no studies have investigated the relationship. One study that examined the correlation between prenatal caffeine intake and childhood AD/HD found

no association between caffeine and performance on the Continuous Performance Test (a measure of sustained attention) (Barr & Streissguth, 1991, as cited in Linnet et al., 2003). Another suggested cause is prenatal psychological stress. Both hyperactivity and attention problems have been associated with maternal stress. For instance, mothers with AD/HD children reported having higher levels of stress during pregnancy. Further, children, with mothers who reported having higher levels of family stress, were more likely to have attention problems (Linnet et al., 2003).

Other factors that have been linked to the cause of AD/HD include pre/postnatal birth trauma, pre/postnatal drug abuse by the mother, genetic abnormalities on the dopamine receptor in the brain, and postnatal injuries to the prefrontal region of the brain (Silver, 2004; Shriner, 2007). Executive functions, such as thought planning and abstract thought, occur in the frontal region of the brain. When this area of the brain is damaged, it is common for the individual to have problems that resemble the core symptoms of AD/HD (i.e., hyperactivity, impulsivity, and inattention).

Diagnosis of AD/HD

There are three main symptoms of AD/HD: hyperactivity, impulsivity, and inattention. While a person with AD/HD may have one or all of these symptoms, it is not enough to be diagnosed with the disorder. In order to be diagnosed with AD/HD, an individual must meet a number of criteria, including sub-criteria, found in the Diagnostic and Statistical Manual, fourth edition (DSM-IV-TR) (American Psychiatric Association, APA, 2000). There are five major criteria, each with a group of sub-criteria. The first

condition of the AD/HD diagnosis is that the symptom (inattention or hyperactivity-impulsivity) must be a continuous pattern of inattention or hyperactivity-impulsivity that is "more frequent and severe" than other individuals at a similar developmental level (APA, 2000, p. 78). Next, the symptom (s) must have been present prior to seven years of age (Criterion B). The diagnosis may take place after age seven, such as with a newly-diagnosed adult, but the symptoms must have occurred before age seven. Criterion C states that the symptoms must be present in at least two different settings, such as home and school. The fourth criterion, Criterion D, requires that the symptom interferes with other types of "developmentally appropriate" functioning or activities, such as "social, academic, or occupational functioning" (APA, 2000, p. 78). Finally, the symptoms cannot be better-explained by another mental disorder such as Anxiety Disorder or Dissociative Disorder, and the symptoms cannot occur during an episode from a psychiatric disorder, Pervasive Developmental Disorder, or Schizophrenia, Criterion E (APA, 2000, p. 78).

In addition to each of the major criterion described above, there are also sub-criteria under Criterion A that must be satisfied, as well. To be diagnosed with AD/HD, an individual must satisfy at least one of two conditions. For the first criteria, the individual must have six or more symptoms of inattention for at least six months. (These symptoms are taken from the list of nine symptoms provided in the DSM-IV-TR). Further, these symptoms must be maladaptive and at an inappropriate developmental level. Some of these symptoms include the following: making careless mistakes in schoolwork or work; difficulty with maintaining attention in activities; avoiding tasks

that require prolonged attention; and being easily distracted by extraneous stimuli (APA, 2000, p. 84).

For the second condition under Criterion A, like the first condition, the individual must have six or more symptoms of hyperactivity-impulsivity for at least six months. In addition, these symptoms must be maladaptive and at an inappropriate developmental level. There are six hyperactive symptoms, including but not limited to: fidgeting with hands or feet; inability to engage in activities quietly; often talking excessively. Symptoms of impulsivity consist of blurting out answers before questions are completed; difficulty waiting for one's turn; and frequently interrupting or intruding on others (APA. 2000, p. 84).

The majority of individuals diagnosed with AD/HD have all three symptoms, but there are some who present only one of the major symptoms. For these individuals, there are different sub-types that can be used to aid in proper diagnosis. The first sub-type is AD/HD-Combined Type, where inattention, hyperactivity, and impulsivity are present. To be diagnosed with this sub-type, the individual must have displayed six or more symptoms of both the inattention and hyperactivity-impulsivity categories for at least six months. The second sub-type is AD/HD-Predominantly Inattentive Type, which has been found to be the most common sub-type (Froelich et al., 2007). For this category, the individual must have presented six or more inattentive symptoms for at least six months, but fewer than six hyperactivity-impulsivity symptoms. Finally, the third sub-type is AD/HD-Predominantly Hyperactive-Impulsive Type, where the individual has presented six or more hyperactive-impulsive symptoms for at least six months, but fewer than six inattentive symptoms (APA, 2000).

It is interesting to note here that a person diagnosed with one sub-type, such as AD/HD-Predominantly Inattentive Type, may develop another sub-type, such as the AD/HD-Combined Type, and vice versa. Further, there may be an instance where an individual does fully meet the criteria for the disorder, and it is also not clear if full criteria were met previously. In this instance, the individual may be diagnosed with "AD/HD Not Otherwise Specified" (APA, 2000).

Once an individual has satisfied all five criterion and the sub-criteria under Criterion A, the diagnosis of AD/HD may be made. However, the professional diagnosing the individual must continue to be cautious. AD/HD may appear similar to other disorders, which were presented in Chapter 1, and there are many behaviors children engage in that may resemble AD/HD but are in fact developmentally normal. The DSM-IV-TR advises that it may not be appropriate to diagnose children younger than four or five years of age with AD/HD, as the behaviors characteristic of young children are extremely variable and may be similar to the symptoms of AD/HD (APA, 2000). For instance, a young boy may be hyperactive or appear to be inattentive, especially when around his peers. The parent may be convinced that his/her child has the disorder because he displays the symptoms at times, but it is important for the professional to be aware of age-appropriate behaviors and *not* automatically jump to the diagnosis.

Gender and AD/HD

There has been some controversy as to the prevalence of AD/HD in both males and females. Some report that AD/HD is more prevalent in males, as can be seen in the greater number of males diagnosed with and treated for the disorder. Still others state that the prevalence and symptom-severity rates are similar in both genders, but what differs is the expression of symptoms (American Psychiatric Association, 2000; Gaub & Carlson, 1997). Males are thought to exhibit more overt/expressive behaviors and symptoms, such as hyperactivity or impulsivity. They are also found to present more problems with inhibition and executive function, such as planning, initiating and stopping behavior, and abstract thought. Females, on the other hand, are more likely to exhibit inattention, and cognitive and language deficits (Reid et al., 2000; Rucklidge, 2006).

Gershon (2002) conducted a meta-analysis of AD/HD literature pertaining to gender differences within the disorder and found that females did indeed demonstrate fewer externalizing symptoms, like hyperactivity. Instead, they were more apt to display inattention, and even showed more intellectual impairment than males (Gershon, 2002; Gaub & Carlson, 1997). Further, females were more likely to have internalized problems like depression, low self-esteem, and anxiety (Gershon, 2002; Quinn, 2005). According to Gershon, this finding may show that females are more likely to suffer from comorbidity with such internalized issues than males. Because females display more inattentive symptoms (as opposed to hyperactive symptoms), and are less likely to be referred for treatment for the disorder, it is no wonder that they are more likely to develop depression and anxiety with their AD/HD. If their symptoms are not recognized, they

may not be referred for treatment where clinical and medical professionals have the opportunity to confront both the AD/HD and the other condition.

This difference in symptom expression of males and females may be the reason why a greater number of males are referred for AD/HD treatment. Because a male is more likely to exhibit AD/HD symptoms that draw attention, professionals (like teachers) may be more likely to take notice of this behavior, and subsequently refer him for diagnosis and treatment. A female, on the other hand, may not display as many expressive symptoms, and her disorder may be overlooked (Sciutto, Nolfi & Bluhm, 2004).

Sciutto et al. (2004) investigated gender bias in referrals for AD/HD in a sample of teachers from northeastern Ohio. The teachers were given a background profile for a child with AD/HD symptoms. The gender and presenting symptoms were varied in attempt to measure gender bias. The teachers read the profile and indicated (on a Likert scale) whether or not they would refer the child for evaluation. For example, the teacher could indicate if he/she would definitely *not* refer the child for further evaluation (1) or he/she would definitely refer the child (6). Results showed that teachers were more inclined to refer boys for treatment than girls for all of the symptom types (i.e. hyperactivity, impulsivity, and inattention), although the symptom that significantly differed between the genders was hyperactivity. The authors concluded that the teachers had a different perception of the behavior of males and females, and this difference in perception may have led to the bias in referral for further AD/HD evaluation. Whatever type of bias that may exist, males are still diagnosed and treated for AD/HD at a greater

number than females, though evidence may point to the similarity in prevalence rates between genders.

Race/Ethnicity and AD/HD

There has not been a great deal of research on AD/HD and ethnicity, and the literature is varied. There is support in the literature for the existence of similar and dissimilar prevalence rates of AD/HD across races/ethnicities (Stevens, Harman, & Kelleher, 2005; Lehmann, 2004). It has been reported that African-Americans have a lower prevalence rate of AD/HD than that of Caucasian children, as evidenced by a nationwide study conducted in the United Kingdom. Meltzer, Gatward, Goodman, & Ford (2000) investigated mental health problems in children and adolescents in Great Britain. In particular, the authors were interested in examining the prevalence of conduct, emotional, and hyperkinetic disorders among children ages 5 to 15. Surveys were sent to a large number of families derived from the Child Benefit Records; the final sample was composed of 10,438 surveys that were returned. One of the results from the data analysis was that black children had a lower prevalence rate of hyperkinetic disorders (i.e., AD/HD) than white children, with prevalence rates of 0.4% and 1.6%, respectively. A similar result was reported by Stevens, Harman, & Kelleher (2005), who found that parents were less likely to diagnose African-American and Hispanic-American children than white American children using parent reports (Stevens, Harman, Kelleher, 2005).

In contrast, when investigating AD/HD and gender differences, it has also been found that African-American males scored higher than African-American females on

items measuring symptoms of AD/HD (i.e., fidgets in seat, leaves seat, talks excessively) (Reid, Riccio, Kessler, DuPaul, Power, Anastopoulos, Rogers-Adkinson, & Noll, 2000). Miller, Nigg, and Miller (2008) reported a similar result from a meta-analysis conducted to review literature pertaining to AD/HD in African-American children. The authors found that African-American children displayed more AD/HD symptoms than Caucasian children, but were only diagnosed two-thirds as often. Also, like previous research, the authors found that African-Americans received less treatment for their disorder than did Caucasian children.

While there is evidence both supporting and not supporting different prevalence rates between races/ethnicities, there is overwhelming evidence that treatment rates differ across races/ethnicities. Olfson, Gameroff, Marcus, & Jensen (2003) reported that overall treatment rates for AD/HD have significantly increased in the last several years, but treatment for minorities has continued to be lower than the rates for white children. For example, treatment rates were lower for African American children than for Caucasian children, with 1.7% of African Americans and 4.4% of Caucasians receiving treatment. It has also been stated that African Americans are over-diagnosed with conduct disorder and under-diagnosed with AD/HD, resulting in the individual not receiving proper treatment for his/her disorder. Because of this inequality in proper treatment, African American children may have substance abuse issues, a higher likelihood of teenage pregnancy, and even job failure (Lehmann, 2004).

One theory that has been proposed regarding why there are differences in treatment rates between African Americans and Caucasians is that minorities receive less treatment because of financial reasons. For example, families that are low-income would

not be able to access treatment services, thus the AD/HD children in those families would not be diagnosed or treated. Evans (2004), however, disagrees with this theory for a number of reasons. First, if one were to follow the low-income/minority theory, there would be a low prevalence rate among both low-income children and black children. That, however, is not the case: AD/HD is less prevalent among black children than among children in low-income families. Further, treatment rates for children in low-income families have increased, but treatment rates for black children have not increased. Whatever the reason for a lack of AD/HD treatment for minorities, it is clear that it has serious implications and must be further researched.

Socioeconomic Status and AD/HD

Research has consistently found that AD/HD is more prevalent among lower-income children. Froehlich et al. (2007) investigated the prevalence, recognition, and treatment of AD/HD in children ages 8 to 15 throughout the United States. Results showed that poorer children were twice as likely as wealthier children to meet the diagnostic criteria for AD/HD. Moreover, AD/HD prevalence rates increased at a higher rate for poor, near-poor, and low-income children than did the prevalence rates for wealthier children (Olfson et al., 2003). Compounding this higher prevalence rate in low-income children is the fact that these same children are also less likely to receive treatment (Froehlich et al., 2007). The end result is a child from a poor family with a disorder that does not get treated.

Children from low-income families may be more likely to have symptoms of AD/HD and less apt to receive treatment for a variety of reasons. Froehlich et al. (2007) stated that AD/HD prevalence rates may be higher in children from poorer families because of the greater number of risk factors associated with low-income families. For example, premature birth and exposure to toxins in utero and in childhood may predispose a child to AD/HD. Low-income children may be less likely to receive treatment because of where the core symptoms of AD/HD are first detected. AD/HD symptoms are often first noticed in school because it is at school where children are often placed into a structured environment. Thus, a teacher, as opposed to a parent, may have a better opportunity to take notice of the behaviors symptomatic of AD/HD. However, if a teacher has a classroom that has an over-abundance of students and is forced to teach with second-hand equipment (such as a teacher in a poverty-stricken community), he/she may not take notice of these behaviors as a teacher in a wealthier school district would (fewer students to monitor, better equipment, etc.). Therefore, a child from a poorer family may attend school in a poor district, and his/her symptoms may go unnoticed. A child may also go undiagnosed because the family does not have adequate medical coverage to get the child officially diagnosed and treated even if the child *was* referred to a professional. These problems for low-income children are aggravated if they are also a minority, as minorities are also less likely to receive treatment for AD/HD.

Treatment of AD/HD

Treatment for AD/HD ranges anywhere from behavior modification therapy, psychological treatment, and treatment with stimulant medication (like methylphenidates). Medication is the primary method of treating individuals with AD/HD, with more children being treated with medication than adults. Research has found that psychological treatment, such as cognitive remediation techniques which consist of building skills that counter the effect of AD/HD, may work better for adults than children because adults are more likely to approach treatment themselves. Many times, children are forced into treatment or therapy by their parent or another professional, and their attitude toward their situation and disorder may affect treatment efficacy. Thus, adults may benefit more from psychological treatment because they are more accepting of, and more open-minded towards, their disorder (Shriner, 2007).

For children who cannot, or will not take medication, or for those whose treatment has been unsuccessful with medication, there are psychosocial treatment modalities. Psychosocial treatments include therapies like behavioral modification, cognitive-behavioral therapy, and psycho-education. Behavioral modification programs usually consist of groups where parents and teachers of AD/HD children learn techniques like the "point system" and "contingent attention," which occurs when appropriate behavior is reinforced by attention from the parent (Arizona CASA Program, 2009, p. 7). It has been reported that while behavioral modification improves certain behaviors or skills, it does not help to reduce the core symptoms of AD/HD. Cognitive-behavioral therapy targets the problem-solving and social skills behaviors of the child in an attempt to improve both. However, this type of therapy has not been found to be overly

successful with AD/HD, but it may be more helpful with comorbid disorders (i.e., disorders that often co-exist with AD/HD). Finally, psycho-education, while not empirically evaluated, is extremely important in the treatment process because parents, teachers, and children all need to be aware of AD/HD and its implications. A treatment plan cannot be developed without knowledge of the disorder, and there are even federal laws mandating that educational resources and accommodations are provided (Arizona CASA Program, 2009).

As stated above, medication is the primary form of treatment for children with AD/HD. Some professionals have stated that successful treatment of the disorder requires a combination of medication, counseling and behavior therapy to be an effective treatment. Anti-depressant medications have been prescribed for AD/HD with some success, but researchers have found that they are not nearly as successful as stimulants. However, they have been prescribed for adults, as many adults have had some success using the medications (anti-depressants) to treat AD/HD; in some cases, they are being prescribed first before any other type of medication is tried (Arizona CASA Program, 2009). Because stimulant medications are the most prescribed, and because stimulants were utilized in the program being evaluated, they will be given greater focus in this section.

It has been estimated that approximately 70% to 90% of children respond to treatment with stimulants; this response rate has been seen with short-term use and use that extends up to 18 months (Olfson et al., 2003; Arizona CASA Program, 2009). Stimulants have been found to increase focus, attention span, and organization, and decrease hyperactivity in individuals diagnosed with AD/HD. Medication effects vary by

person, but Stein, Sarampote, Waldman, Robb, Conlon, Pearl, Black, Seymour, & Newcorn (2003) found that children with the inattention subtype had better success with lower doses of stimulants. Further, children with hyperactive/impulsive symptoms responded better to higher doses of stimulants.

Stimulants include medications such as methylphenidate and amphetamine-dextroamphetamine. Methylphenidates stimulate the central nervous system, but how they do so is unknown. Amphetamine-dextroamphetamines also stimulate the central nervous system, and work by increasing the amount of different chemicals and neurotransmitters (such as dopamine) in the brain; it also works as an appetite suppressant (National Institute on Drug Abuse, NIDA, 2009). Of the different stimulants, methylphenidate is the drug most prescribed to treat AD/HD. Popular forms of methylphenidate are known as Ritalin, Concerta (a more improved, longer-lasting version of Ritalin), and Metadate (Arizona CASA Program, 2009). Because Ritalin, Concerta, and Adderall (described below) were the most commonly prescribed medications in the current program being evaluated, those medications are discussed in detail.

Ritalin is a central nervous system stimulant and is the most prescribed form of methylphenidate due to its high success rate due to the fact that it has fewer side effects. Since Concerta is a longer-lasting form of Ritalin, they will be discussed together. Specifically, both affect the areas of the brain and nerves that contribute to inattention, hyperactivity and impulsivity. After taking the medication, the individual may be able to better attend to stimuli (i.e., be more focused), and less restless, aggressive, distracted, and impulsive. There are a number of side effects, however, that may affect a small number of individuals taking the medication. Some of the more common side effects

include an increased heart beat and increased blood pressure; less common side effects consist of chest pain, fever, blurred vision, and convulsions (Thomson Healthcare, 2009).

Finally, another medication that is used to treat AD/HD, and that was utilized in the current program being evaluated, is Vyvanse. Vyvanse is a long-lasting central nervous system stimulant that is taken one time per day. It focuses on brain chemicals that affect an individual's hyperactivity and impulsivity, in particular altering the level of certain natural substances found in the brain (Medline Plus: Trust Health Information for You, 2009). It is one of the more recent medications developed to treat the symptoms of AD/HD. It has been found to be effective for both children and adults, but there are a number of notable warnings and side effects (Shire US, Inc., 2009). First, it has been found that long-term use in children may slow growth, and it may be habit-forming. Further, the following side effects can result from taking Vyvanse: rapid or uneven heartbeat; decreased blood pressure; increased blood pressure; hallucinations; skin rash; dry mouth; or sleep problems (among others) (Medline Plus: Trusted Health Information for You, 2009). Further, there are many insurance companies that will not accept a Vyvanse prescription unless the patient (in this case, the juvenile) has already been prescribed two other AD/HD medications and has failed on both of those medications.

While it is the most commonly prescribed stimulant, methylphenidate cannot be refilled and does not have long-lasting effects (Medline Plus: Trusted Health Information for You, 2009). The medication needs to be taken several times a day, which can make it difficult to maintain compliance, especially with children. There are many instances where the child needs to take the medication multiple times while at school. This can lead to the child missing out on valuable education because they have to leave the

classroom to take their medication, and it can also lead to the child being negatively labeled by their peers, neither of which benefits the child. There has also been some concern as to the addictive nature of methylphenidate. Methylphenidate has characteristics similar to amphetamines, and some professionals worry that it may lead to the child becoming addicted to the medication. Methylphenidate acts slowly throughout the brain, however, preventing the high that abusers get from amphetamines. Long-term studies show that children can safely take the stimulant for a long period and not experience any dependence. On the other hand, a person may crush the pills and inhale them through the nostrils to produce a type of high or euphoric state of mind, so methylphenidate does have abuse potential (Arizona CASA Program, 2009).

Amphetamine-dextroamphetamines are also used to treat AD/HD. They are usually prescribed after stimulants have been attempted, since the majority of individuals will respond to stimulants. The most popular forms of amphetamine-dextroamphetamines are known as Adderall and Adderall XR. While it does not work for all individuals who take it, Adderall decreases restlessness and increases focus for those who cannot concentrate for long periods of time, are overactive, and/or have unstable emotions (Thomson Healthcare, 2009). Adderall is less expensive than Ritalin or Concerta and it usually only needs to be taken one time per day. It has even been found to be superior to Ritalin when evaluating the evening effects of the medication. The effects of Adderall lasted longer than did the effects of low-dose Ritalin. Some of the side effects of Adderall include dizziness, nausea, anxiety or nervousness, diarrhea, or changes in sexual drive, among others (Thomson Healthcare, 2009).

For the smaller percentage of children and adults who do not respond to stimulant medication, other forms of medication may be prescribed, such as selective serotonin reuptake inhibitors (SSRIs). Popular SSRIs that are sometimes prescribed to treat AD/HD include Strattera, Paxil, Zoloft, and Prozac. Strattera, one of the medications utilized in the current program being evaluated, increases the amount of serotonin (a neurotransmitter in the brain) available in the synaptic cell. By inhibiting the amount of serotonin that is taken back into the postsynaptic cell (i.e., it inhibiting the reuptake), it is allowing a greater quantity of serotonin to be available, thus decreasing the individual's AD/HD symptoms (in particular, hyperactivity and impulsivity). SSRIs are also used to treat comorbidity of depression and AD/HD. Some of the risks and side effects of taking Strattera include the development of suicidal ideations in children/adolescents, injury to the liver, chest pain, nausea, increased blood pressure, and hallucinations, among others (Thomson Healthcare, 2009; May Foundation for Medical Education and Research, 1998-2009).

Medication, particularly stimulants, has been found to be effective in treating the symptoms of AD/HD. Utilizing medication with children, however, no matter how effective the statistics show it to be, must be done with caution. Long-term evaluations must be conducted to assess the safety and effectiveness of long-term use of medications, as there are many children who take medications for years and who frequently stop and start medications. Use of medication with children has been questioned throughout the AD/HD literature, but it was chosen as the avenue of treatment in the current program being evaluated because the population was composed of children who lack self-discipline and often the parents were not involved in their children's lives.

AD/HD and Juvenile Delinquency

In 2007, the total number of juvenile arrests in the United States was approximately 2.18 million, a decrease from the previous two years. The number of juvenile arrests had risen through 2005 and 2006, but that trend ended in 2007 when the number of juvenile arrests for violent crime began to decrease. Juvenile accounted for approximately 16% of all violent crime arrests and 26% of all property crime arrests in 2007. The number of violent crime arrests had been steadily increasing between 2004 and 2006, but then declined in 2007 when (violent crime) arrest rates fell 4%. Arrests for property crimes, however, have *increased* 4%, which is the first time in 13 years an increase has occurred (Puzzanchera, 2009). It is no secret that juvenile delinquency is an important issue in this nation. What some may not realize, though, is that there may be a way to lower the rate of juvenile delinquency by treating the symptoms of AD/HD. Research has found that AD/HD is correlated with juvenile delinquency. In particular, it has been suggested that the symptoms of AD/HD can actually lead to criminal behavior, i.e., juvenile delinquency (Babinski, Hartsough, & Lambert, 1999). For example, an adolescent's impulsive nature may make it difficult for them to refrain from stealing, whereas a non-AD/HD peer would be able to practice more self-control. Thus, the AD/HD adolescent may be more likely to have contact with law enforcement, as opposed to an adolescent who was able to resist the urge to steal and thereby avoiding law enforcement and arrest.

Evidence of the AD/HD-delinquency association can also be found in court records. Mannuzza, Klein, Abikoff, & Moulton (2004) found that youths with AD/HD are four to five times more likely than non-AD/HD youth to be arrested, and are also more likely to have multiple arrests and convictions. This may be due to a variety of factors, including the AD/HD symptoms, and peer rejection, which will be described at a later point. The problem of AD/HD and criminality does not stop in adolescence. It has been found that between 22.5% and 52.2% of prison inmates from multiple countries, including the United States, Canada, and Norway, met criteria for AD/HD symptoms or were diagnosed with AD/HD in childhood (Eyestone & Howell, 1994; Gudjonsson, Sigurdsson, Young, Newton, & Peersen, 2009). This is especially disturbing considering the prevalence of AD/HD in the general adult population has been estimated from approximately 2.9% to 4% (Faraone & Biederman, 2005; Kessler, Adler, Barkley, Biederman, Conners, Demler, Faraone, Greenhill, & Howes, 2006). With the prevalence of AD/HD in prison, and with the prison population steadily increasing, the relationship between AD/HD and delinquency/criminality needs further investigation.

Mannuzza, Klein, & Moulton (2008) investigated adult criminality with a sample of AD/HD juvenile males. Clinicians evaluated the boys at 18 and 25 years of age, and then gathered arrest records when the individuals were 38 years of age. When compared to the control group, the AD/HD males were more likely to have been arrested, convicted, and incarcerated. The AD/HD males also had more felonies and violent offenses. The authors also reported that the increased likelihood of criminality for AD/HD males only occurred when the individual had developed either a substance abuse or antisocial disorder. In fact, the development of either a substance abuse or antisocial

disorder in adolescence fully explained the risk for later offending. For instance, AD/HD males who did not have a substance abuse or antisocial disorder had offending rates similar to the control group. However, the authors also point out that, while substance abuse and antisocial disorders are important for the increased risk of adult criminality, AD/HD has also been found by others to increase the likelihood that an individual will develop those two disorders (Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1998, as cited in Mannuzz et al., 2008; Ellison, 2003). Therefore, there seems to be multiple risk factors at work in the development of delinquency, as opposed to only AD/HD or substance abuse and antisocial disorders, but AD/HD may be an important link.

The presence or absence of AD/HD does not automatically determine whether or not an adolescent will become a delinquent. There has been evidence that AD/HD does not predict future adolescent delinquency or criminality when certain variables are taken into account (antisocial behavior and noncompliance) (Lee & Hinshaw, 2004). Further, there is also support for the idea that other factors are at work that may be more important than AD/HD in the development of delinquency. Moffitt (1990) found that adolescent males with Attention Deficit Disorder (ADD, the precursor to AD/HD) who were delinquent by 13 years of age performed the worst on assessments measuring family adversity, verbal intelligence, and reading. (The ADD-delinquent males were compared with ADD males, delinquent males, and a control group.) The antisocial behavior of the ADD-delinquent males was more likely to be persistent over time; they faced more family adversity than the other groups; and they also had deficiencies in motor skills and IQ (which remained constant throughout development).

After examining all of the evidence, however, the majority of which is not discussed here, the authors found that differences in family environment may have a large impact on the development of delinquency. For example, when investigating ADD symptoms at five years of age and family adversity, it was discovered that those two variables alone explained a large amount of variance in antisocial behavior at age 11. Therefore, the authors concluded that a child's family environment can have a very large impact on a child's risk of offending or antisocial behavior (Moffitt, 1990). This finding can be seen as a positive, because it may show that with proper intervention, especially for AD/HD children, the likelihood of criminality can be lessened.

In addition to the AD/HD-symptom explanation of delinquency, there are other noteworthy proposed factors that may lead to criminal behavior. One such theory of delinquency/deviant behavior is Kaplan's (1980) defense of self theory. Kaplan's theory states that children will engage in deviant behavior in response to low self-esteem and feelings of self-rejection. These thoughts may have developed in the course of social interaction with peers, where the individual was not able to effectively adapt to, or cope with situations undermining their self-esteem, and thus developed a negative self-image. This deviant behavior/delinquency is a way to improve the individual's self-image by getting rid of negative thoughts. When the adolescent engages in risky behavior, it may make them feel better about themselves, especially if they do not get caught. Kaplan's theory can be connected to AD/HD because children with AD/HD are more likely to struggle with feelings of low self-esteem and depression, especially females (Biederman, Newcomb, & Sprich, 1991; Quinn, 2005). These children with low self-esteem, due to struggling with the symptoms of AD/HD, may engage in delinquent behavior in order to

enhance their self-image. Therefore, treating the symptoms of AD/HD may help a child develop a positive self-image, and deviant/delinquent behavior may be less likely to occur.

Another possible explanation for the association between AD/HD and juvenile delinquency is substance abuse. Research has shown that children with AD/HD are more likely to self-medicate with drugs or alcohol (Ellison, 2003; Mannuzza, Klein, & Moulton, 2008). In fact, Ellison (2003) reported that adolescents and teenagers with AD/HD are two to five times more likely to smoke cigarettes and abuse alcohol, and are also at a higher risk of teen pregnancy. It is thought that drugs like alcohol, marijuana, and tobacco are used to literally slow the child down and relax them (i.e., decrease the effect of the AD/HD symptoms) (Silver, 2004). It is quite possible that these types of risky behaviors, like drinking or abusing drugs, may also lead adolescents into delinquent lifestyles. For instance, if an adolescent discovers that smoking marijuana allows him to remain calm, he may be more apt to continue using the drug. Eventually, the drug use may lead to possession of the substance, which may result in the adolescent getting arrested by law enforcement. Once again, there is a link between AD/HD and delinquency, and a variable in this relationship could be substance abuse.

AD/HD and Learning Disabilities

As previously stated, AD/HD has been associated with learning disabilities/disorders. Approximately 25% to 50% of adolescents with AD/HD are also thought to have a learning disorder or handicap (Mayes, Calhoun, & Crowell, 2000). A

child is said to have a learning disability when there is a discrepancy between the child's level of educational achievement and his/her ability to learn. It should be noted here that the learning disability cannot be caused by an emotional disorder, mental retardation, difference in culture, or other disadvantages (Lyon, 1996).

Learning disabilities are referred to as "school-related" problems because it is at school that these difficulties are first noticed (Cowardin, 1998, p. 1). Activities that require prolonged attention on such a variety of tasks, and activities that are under the scrutiny of teachers, are usually only found at school; therefore, it is logical that learning disabilities are known as school-related problems. Further, adolescents who have a learning disability also have problems in the area of social functioning, in particular trouble learning the social cues required in decision-making outside of academics. It is this deficiency in making positive decisions in non-academic situations that may lead a person to encounters with law enforcement (Cowardin, 1998). In fact, there is evidence in the literature supporting a relationship between learning disabilities and juvenile delinquency. Brier (1989) reported that estimates of juvenile delinquents, with a learning disorder, have been found to range anywhere from 12% to 70%. Because adolescents with AD/HD are more likely to have a learning disorder, one may wonder how many of these delinquents also have AD/HD.

Offenders with Learning Disabilities

Cowardin (1998) cites a number of characteristics typical of the learning-disabled offender, which are thought to contribute to the disproportionate number of offenders

with a learning disorder compared to non-disabled offenders. These characteristics include deficiencies in cognitive functioning; language; social and emotional maturity; and attention, among others. Offenders have been found to have an intelligence quotient (IQ) seven to nine points lower than non-offenders; this IQ deficit is similar to the IQ of the learning-disabled population, even after controlling for age, gender, race, and socioeconomic status (Cowardin, 1998, pp. 2-5). In addition, recidivists have a lower IQ than non-recidivists, which, according to Cowardin (1998), may lead to the abundance of the learning-disabled in "third strike offenders" (p. 2). In regards to intelligence, it should be noted that the learning-disabled have an IQ in the normal range for intelligence, so a learning disability should not be confused with mental retardation (Cowardin, 1998).

The learning-disabled offender often has a deficit in internal language processing, which contributes to the inability to plan and control one's behavior (i.e., impulsivity). For example, this type of offender will not fully plan the commission of their crime or consider its consequences, will improvise as they commit the crime, and will most likely get caught because of that.

Offenders with a learning disorder are often socially and emotionally immature. They may become aggressive or sullen when confronted by authorities, instead of trying to "talk their way out of it" like non-disabled offenders may attempt to do. Further, learning-disabled offenders may have emotional deficits (not to be confutilized with the emotionally disturbed), where they will explode with anger or frustration in inappropriate situations. These outbursts are usually in response to failing in a social or academic situation, and may be utilized to escape a certain task, such as a mathematics test. In fact,

this social and emotional maturity may account for the fact that "31% of the Learning Disabled and 57% of the Emotionally Disturbed" have been arrested at least once in five years following high school (Cowardin, 1998, p. 5). These individuals simply may not have the social and emotional skills necessary to deal or cope with a criminal incident.

Finally, the learning-disabled offender may have deficits in attention. Many researchers have reported that these offenders have difficulty maintaining focus or attending to a stimulus. Cowardin (1998), however, states that it is not the offender's inability to focus on a stimulus that is the problem. The issue arises from the offender being focused on *too many* stimuli, thus giving the appearance that the offender cannot focus. Because the offender is attending to so many stimuli at once, it appears that he/she cannot focus at all, when in fact he/she has the ability to focus.

AD/HD and School Performance

Symptoms of AD/HD, such as impulsivity and a lack of focus, can lead the child or adolescent to do poorly in school. In addition, there are certain types of learning disabilities, such as auditory perception disabilities, that may cause a delay in the child's ability to keep up with the teacher as he or she is writing information on the blackboard (Silver, 2004). Further, adolescents with AD/HD are more likely to drop out of high school or take special education classes, and are less likely to complete college (Loe & Feldman, 2007; Ellison, 2003). When a child or adolescent displays the symptoms of AD/HD, his or her teacher may grow tired of always having to remind that student to pay attention to his or her work and simply just *stop* reminding him or her. This could lead to

the child not understanding his or her work—because no one is keeping him/her on track with the assignment or class work—and then not finishing the work because he or she does not understand how to do so. Eventually, this may lead to the child or adolescent failing the grade.

If this poor school achievement is not confronted and is allowed to continue, it may lead to the child getting rejected by his or her peers. Research shows that children who have been rejected by their peers engage in higher amounts of juvenile delinquency, which has also been associated with AD/HD (Bartol & Bartol, 2009). Therefore, AD/HD can lead to poor school achievement, which may lead to peer rejection (kids being rejected because of abnormal behavior) and, ultimately, delinquent behavior. Peer-rejected children may become delinquent by making friends with other delinquents who have also been rejected, or perhaps by engaging in the delinquent act(s) to seek attention from peers (Schmalleger & Bartollas, 2008).

Additional AD/HD Impact on Delinquency

The child does not always have to be rejected by their peers to engage in delinquency. Some of the symptoms of AD/HD may predispose a child to delinquent behavior, such as aggression, hyperactivity, and impulsivity (Bartol & Bartol, 2009). Children with AD/HD may see something they really want in a store and physically cannot resist taking it (impulsivity), they take the item, and they get arrested for shoplifting. Further, an aggressive child with an impulsive nature (aggression has also been found in adolescents with AD/HD) may not be able to control their anger, and may

strike another child if he/she is provoked. However, if the AD/HD symptoms are treated, the deviant/delinquent behavior may lessen or disappear altogether. As one can see, the connection between AD/HD and juvenile delinquency is an important one.

Hypothesis and Research Questions

In order to evaluate the impact AD/HD has on juvenile delinquency, a research project was completed. This project evaluated the effectiveness of a program designed to treat AD/HD in an effort to reduce juvenile delinquency. The program is discussed in detail in the following chapter. The research hypothesis was: H_1 = Proper diagnosis and treatment of AD/HD will lessen delinquent acts in juveniles. In addition, the following research questions were asked:

- Who are the youth in the program?
- What kind of offenses do they commit?
- Does school performance improve once treatment dealing with AD/HD in conducted?

Summary

Approximately 2 million to 8 million children have symptoms of AD/HD throughout the United States. The exact causes of the disorder are unknown, but research has supported genetics and prenatal/postnatal maternal trauma. There are a variety of

methods proposed to treat AD/HD, but the most common form of treatment for children is treatment with methylphenidate medications. Different types of treatment for AD/HD were discussed, including an in-depth description of various medications utilized.

There are three main symptoms of AD/HD: inattention, impulsivity, and hyperactivity. However, it is not enough for a person to have these symptoms to be diagnosed with the disorder. There are certain conditions that must be met for an individual to receive the diagnosis. For example, one such qualification was that the individual needed to have the symptom(s) for at least six months. It was also noted in the chapter that the diagnosis of AD/HD is not appropriate for children younger than four or five years of age, as very young children often display the behaviors indicative of AD/HD, which is very normal for this age group.

There is a great deal of controversy regarding gender, race, and AD/HD. Conflicting evidence abounds for the similar and dissimilar prevalence rates for males and females having the symptoms of AD/HD (evidence supports both similar and differing rates), but it is clear that males are referred and diagnosed at a greater number than females. In addition, research supports a differing prevalence rates between minorities and Caucasians, with African-Americans being less likely *and* more likely to have AD/HD symptoms (especially hyperactivity). Like the difference in treatment between males and females, minorities also receive less treatment than Caucasians, as do children from lower-income families. Many theories for the difference in treatment, for gender, race, and socioeconomic status, have been devised and were discussed.

Finally, the relationship between AD/HD and juvenile delinquency, learning disabilities/disorders, and school performance were discussed in great detail. AD/HD has been correlated with both juvenile delinquency and learning disabilities, with AD/HD children being more likely to experience both. Explanations for juvenile delinquency and its link to AD/HD include Kaplan's defense of self theory, and substance abuse. As for school performance, children with AD/HD may be more apt to experience difficulty in school (aside from learning disabilities). The actual AD/HD symptoms themselves may lead to the adolescent having difficulty in school. For example, a hyperactive boy may get removed from the classroom for being disruptive to the other students; this could result in the boy missing valuable education.

The next chapter will include a description of the methods used to evaluate the program, including an in-depth discussion of the program, where the data were obtained, and what analyses were completed.

Chapter 3

Methodology

Research Hypothesis and Research Questions

This research project evaluated a program that diagnoses and treats the symptoms of AD/HD in delinquent juveniles. Because of the link between symptoms of AD/HD and criminal behavior, it was hypothesized that proper diagnosis and treatment of AD/HD will lessen delinquent acts in juveniles. In addition, three research questions were asked:

- Who are these youth in the program?
- What kind of offenses do they commit?
- Does school performance improve once treatment of AD/HD is conducted?

Secondary data were analyzed. The data were collected through a grant project at a local detention facility. The program was originally funded through a grant from the State's Department of Youth Services (DYS). The grant funded the program from 2005 through 2008 (2005-2006; 2006-2007; 2007-2008). However, after the DYS grant funding ended, the Juvenile Court chose to continue the funding for the program, so the program is still being continued into 2009. The program was designed to identify symptoms of AD/HD in juveniles coming into the facility. All juveniles coming into the facility, who had not been previously tested for the program, were given the initial AD/HD screening test, the computer-based Conners' Continuous Performance Test (CPT

II). Every attempt was made to test all juveniles coming into the facility, but due to the individual conducting the testing only being a part-time employee, this was not always possible.

Data Collected

Demographical data of each juvenile were collected through the duration of the study, which included: gender, age, race/ethnicity, family living situation, school attended, and zip code. The CPT II scores of each juvenile were also collected, as were their grade point averages (GPA) number of school absences, number of arrests during the program, arrest history (six months prior), and arrests six months following program completion. The time length of six months was chosen because of research evidence indicating that offenders typically recidivated within two months of release from incarceration or the completion of various rehabilitation programs (Daniel & Anderson, 2003). Because recidivism has been found to occur within two to three months, it was determined that a duration of six months following program participation would be sufficient to gather recidivism data.

Information concerning GPA and school absences was gathered from report cards collected six months before and after the program. Arrest information, including type of offense, was obtained using a program known as CourtView. CourtView is a program utilized at the Juvenile Court that enables staff to examine arrest, offense, and detainment history (i.e., court history) of all juveniles involved with the court system. This program is password protected, and staff must be given permission/access to the system.

In addition, the type of offense the juvenile was charged with, and the name and type of school attended at the time of program entrance was recorded. It should be noted that status offenses were categorized as public order offenses in the analysis. Also collected were data regarding whether or not the juvenile withdrew from school, and whether or not the juvenile graduated from high school. Behavior issues of the juveniles were gathered using Child Behavior Checklists (CBCLs) and Teacher Reports (Achenbach System of Empirically Based Assessment, ASEBA, 2001). The information from the two forms was extremely similar, so the data from both were combined. CBCLs and Teacher Reports were given to the parents and teachers of the juveniles in order to determine the presence and frequency of behavioral issues indicative of AD/HD and other emotional problems at home and in the classroom. For instance, the parent would be given an example behavior, such as "fidgets" or "is too dependent," and would be asked to rate the seriousness of the problem behavior, if it exists in the juvenile. The reader could rate the behavior as a "0" (Not True, as far as you know); a "1" (Somewhat or Sometimes True); or a "2" (Very true or Very Often) (ASEBA, 2001). Copies of the CBCL and Teacher Reports are found in Appendix A and Appendix B. CBCLs, Teacher Reports, GPA, and school absences, both before and after the program, and tests for AD/HD were not available for all juveniles.

The CPT II data were stored on the laptop computer that was utilized to administer the test. The CPT II software, which requires a password to gain access, recorded all administered tests; there was also an excel sheet on the laptop containing scores of all CPT II tests administered. There was also a hardcopy file of the data stored in a locked filing cabinet, to which only the AD/HD Coordinator had a key.

Sample

The sample was composed of 46 juveniles. Those children entered the AD/HD program through detention admissions, arrests, and referrals made to the program by the Judge, Magistrates, and others. The program, or treatment, group, which equaled 54.35% of the total sample, consisted of 25 males and females (32.61% and 21.74% of the total sample, respectively). The control group, which composed 45.65% of the total sample, consisted of 21 males and females (41.3% and 4.35% of the total sample, respectively). The treatment group was those juveniles who had successfully completed the program, and the control group was those who had been terminated from the program due to non-compliance with program conditions or refusal to participate by the youth or his/her parent. One of the major reasons a juvenile was terminated for non-compliance was a lack of attendance at appointments with the program psychiatrist.

The juveniles referred to the program were those who had been arrested; those who had been suspended or expelled from school; those who had exhibited serious behavioral problems; and those who appeared to have had any of the symptoms of AD/HD (inattention, hyperactivity, and impulsivity). In addition, the sample consisted of Caucasian, African American/Black, and Hispanic males and females between the ages of 7 and 18, and included only residents from the county that was served by the juvenile justice center. Further, participation was voluntary, and both parent and juvenile had to sign a consent/assent form before participation in the program began.

Variables Measured

There were four key variables measured in the research study. These were: juvenile, AD/HD, recidivism, and school performance. "Juvenile" was operationalized, or measured, as any individual under the age of 18 who is admitted into the detention center. Thus, the range for the "juvenile" variable was between the ages of 7 and 18, due to the fact that a child under seven years of age will not be admitted into detention and individuals over 18 years of age will be sent to the county jail. AD/HD was operationalized as a score of 50% or above on the CPT II with a diagnosis of the disorder by the program psychiatrist. A score of 50% or above indicated that the adolescent or teenager possessed some of the symptoms of AD/HD, such as hyperactivity, impulsivity, or inattention. School performance was assessed using the juvenile's GPA, taken from report cards. Finally, recidivism was operationalized as any new arrests for the juvenile while participating in the program.

Conners' Continuous Performance Test (CPT II)

The continuous performance test utilized to screen juveniles for AD/HD was chosen by the Supervising Counselor of the juvenile facility. Continuous performance tests are tests used to evaluate an individual's ability to sustain their attention. It should be noted that there are many versions of continuous performance tests for AD/HD, but the CPT II referred to in the current study is the Conners' Continuous Performance Test (Version II) developed by Dr. C. Keith Conners. Besides being utilized for detecting attention problems, the CPT II has been found to be effective in measuring other

symptoms of AD/HD, hyperactivity and impulsivity, and deficits in executive functioning. It is also utilized to monitor the effectiveness of treatment. For example, the CPT II may be utilized to measure the effectiveness of methylphenidate medication treatment on a child's symptoms of AD/HD (Conners, & Multi-Health Systems, Inc., Staff, 2000).

The CPT II administered in the program was standardized using a combined sample of 2,686 clinical, neurologically-impaired, and non-clinical juveniles and adults ages six years and older. The clinical sample was composed of 378 individuals with AD/HD, the majority of which were male (69.4%). The neurologically-impaired adult sample consisted of 223 adults diagnosed with neurological impairment, and like the clinical sample, contained mostly male participants (55.6%). The majority of the non-clinical sample was standardized using female participants (52.8%), and it was mostly Caucasian (47%). The combined sample used to normalize the CPT II was collected from over 30 states/provinces throughout the United States and Canada (Conners, & Multi-Health Systems, Inc., Staff, 2000).

The final CPT II score combines a variety of measures, including omissions (where the individual did not respond to the target letter), variability (consistency of response time), and commissions (the number of times the individual responds to a non-target letter), among others. There has been extensive evaluation on the reliability and validity of these measures in an attempt to assess the CPT II. Split-half reliability assessments have been very positive, with correlations reported from 0.66 to 0.95, indicating test-retest reliability (0.08 to 0.92, $p < .01$). Thus, evidence shows that the CPT II is reliable, consistently measuring AD/HD.

The CPT II has also been found to be a valid test at identifying symptoms of AD/HD. Conners (1994) investigated whether or not the CPT II could identify differences between three groups: AD/HD or ADD only, AD/HD comorbid with another disorder, and other participants with a different clinical diagnosis. Results showed that the AD/HD or ADD only group scored significantly worse than the other two groups. This group made more omission and commission errors, responded to targets more slowly, and varied more in reaction time, among other differences. Other analyses have taken place, and have achieved similar results. The CPT II, therefore, appears to be a valid identifier and measurement of AD/HD symptoms (Conners, 2000).

As stated above, the CPT II has also been found to be effective in evaluating changes in treatment. For instance, Conners, March, Fiore, and Butcher (1993; as cited in Conners & Multi-Health Systems Staff, 2000) reported a linear effect of the level of medication dosage and CPT II reaction times, in addition to better response styles with higher dosages of medication. Further, Kirby, VandenBerg, and Sullins (1993; as cited in Conners, 2003) found that the CPT II was able to distinguish when individuals were on and off their methylphenidate medication, with better reaction times reported while on the medication. Therefore, the CPT II has been found to differentiate between levels of medication and their effectiveness, and is thus able to detect improvements or changes in treatment.

The CPT II takes approximately 14 minutes to administer. Additional time is required to gather demographical data and to explain the results to the juvenile. The following demographic variables were collected for each juvenile: first and last name and middle initial; address; telephone number; date of birth/age; and any medications that the

juvenile was currently taking or had taken in the past. The instructor then gave each juvenile the directions to the test, which consisted of pressing the space bar on the computer keyboard for every letter of the alphabet that appeared on the screen, except for the letter "X"; when the letter "X" appeared on the screen, the juvenile was not supposed to press the space bar. Any questions or concerns had by the juvenile were addressed, and the test was begun.

When the test was completed, the computer scored the evaluation and the instructor explained the score to the juvenile. According to Dr. Conners, creator of the CPT II, if the juvenile scores a 50% or higher on the evaluation, he/she has tested in the clinical range, meaning that he/she has symptoms that are similar to other juveniles with AD/HD. If the juvenile scored below a 50%, then there was little-to-no indication that he/she had AD/HD. Letters were then sent home to the parent or guardian of all the juveniles who scored in the clinical range explaining that the adolescent had been tested for AD/HD and had scored in the clinical range; these letters also provided information concerning the program. It should be noted here that there were instances where a juvenile, who had actually tested below the clinical range on the CPT II, was still referred to and treated in the program, because his/her behavior was a major concern to the person referring the juvenile.

The AD/HD Program

Any parent or guardian who was interested in having their child/ward participate in the program contacted the AD/HD Coordinator, who set up the initial appointment

with the psychiatrist working with the juveniles. This initial appointment was utilized to get permission from both the parent/guardian and the juvenile, who both needed to sign a consent/assent form, to treat him/her; to make a final diagnosis of AD/HD, as the CPT II test is *not* utilized for the purpose of diagnosis; and to get the history of the juvenile and the parent(s) so that the proper medication could be prescribed. If the juvenile was diagnosed with AD/HD, he/she continued seeing the psychiatrist every two weeks for at least six months, unless the juvenile was progressing through the program and was doing well. In those cases, appointments with the psychiatrist were less frequent, depending on the individual situation. Participation in the program was ended if the juvenile or parent/guardian was non-compliant (i.e., refused to take the prescribed medication, missed three consecutive appointments), if the juvenile turned 18 years of age, or after six months of program participation. If the juvenile required additional treatment, and the family could not afford services outside the program, the youth was allowed to continue the participation. Juveniles whose families could afford outside treatment, and who had completed program requirements, were then referred to treatment centers to continue their AD/HD therapy.

Treatment in the AD/HD Program

The psychiatrist in the program received his medical degree from Harvard University, and had been working in the field for approximately 40 years. When determining what medication should be utilized for each juvenile in the program, which was the only method of treatment in the program, the psychiatrist followed a general

pattern of prescribing medication. These medications were described extensively in Chapter Two. If there was a certain type or brand of medication that had worked well for the student in past treatment, that medication would be prescribed again. On the other hand, if the juvenile was allergic to a particular type of medication, or had been prescribed a medication in the past that was unsuccessful, those medications would be avoided. The particular medication(s) prescribed to each juvenile depended on his/her medical history, gathered in the initial appointment. The medical history of each juvenile included any history of surgery, injury, disease, and prescribed medication.

If there were no medical issues or reservations with specific medications, the psychiatrist started the medicinal treatment with the methylphenidate Ritalin, since 70% to 90% of those who take it respond to treatment (Olfson et al., 2003; Arizona CASA Program, 2009). If the parent or juvenile felt that the medication was not strong enough or was not working, the psychiatrist then prescribed Concerta, a longer-lasting, improved version of Ritalin. If Ritalin or Concerta were not effective for the juvenile, the doctor would next prescribe Adderall, Vyvanse, or Strattera, most often in that order. Treatment mainly took place at the juvenile court, but there were some instances where the juveniles ceased participation in the program to continue with the psychiatrist at his practice. These juveniles were those who needed additional help that was beyond the scope of the program, or those who could not make appointments because of a scheduling conflict. Appointments took place every other Thursday morning from 9:30 a.m. to 12:00 p.m.

Reliability and Validity

To test the data, a SPSS file was created. All information was coded to protect the identity of the juvenile. The issue of validity was addressed by using a well-established, researched test of AD/HD. The test was not designed by any of the individuals involved in the study, but was instead made up by an AD/HD professional. In addition, the test administrator followed all instructions handed down in the testing manual, and abided by the cut-off criteria for the test results. Also, the arrest statistics were valid because they were taken directly from the court documents, and the record of every child who gets arrested is recorded (whether they were in detention or not). Finally, the "juvenile" measure was valid because only certain ages are accepted into the facility by American Correctional Association Accreditation standards (the facility is accredited); thus, anyone below the age of 7 years or over the age of 17 years was not accepted into the facility where the study occurred, and was likewise not included in this study.

The reliability of the measures was also taken into account. For example, the AD/HD test was reliable because it was standardized and computerized, and no juvenile could alter the test in any way. In addition, only two people did the actual test administration, which increased the reliability of the test instructions that were given. Further, each test administrator had a script of testing instructions that she said to each juvenile delinquent taking the test, and there were distinct instructions on how to run the AD/HD computer program. As for arrest record reliability, because the records are updated frequently by the juvenile court and remain on file while the juvenile is still under the age of 18 years, and unless they are not expunged, the arrest records were never

discarded or tampered with during the course of the study. If a juvenile was arrested again during the study, the records were updated, but still reliable. Finally, the "juvenile" measure was reliable because every juvenile turned 18 years of age during the program was terminated; thus, each adolescent taking part in the study remained a "juvenile."

Analysis

The data were analyzed using descriptive and comparative statistics. Descriptive statistics were utilized to determine the frequency of variables for all of the juveniles, for the control group, and for the treatment group. Comparative statistics were utilized to compare those who completed the program with those who did not, and to compare those who have recidivated and those who had not. The comparative statistics were used to determine if any differences between those groups was present. The dependent variables were: (1) Who completed the program and who did not complete the program? (2) Who recidivated and who did not recidivate? (3) Whose school performance increased and whose did not? Please note that some of the dependent variables were utilized as independent variables in regards to which research question was being evaluated. Crosstabulations were conducted to determine any significant differences in gender, program group, and race/ethnicity. T-tests were also utilized to determine any differences between the control and treatment groups in terms of the number of arrests prior to, during, and following participation in the program; the juvenile's age at the time of arrest; days absent from school prior to and following the program; and GPA prior to and following the program.

Summary

This research project utilized secondary data to evaluate a program designed to reduce juvenile delinquency by treating the symptoms of AD/HD. Data were collected over the course of three years, and included information such as: the demographics of each juvenile; their arrest/court history; school performance; performance on the CPT II; and information gathered from the CBCL and Teacher Reports. Descriptive and comparative statistics were conducted, in addition to crosstabulations and t-tests. The next chapter discusses the results of the data analysis.

Chapter 4

Analysis and Findings

This research project focused on AD/HD and its relationship with the criminal behavior of juveniles, or juvenile delinquency. Specifically, this project evaluated a program that was designed to reduce juvenile delinquency by treating the symptoms of AD/HD. Data were collected for the program over a period of three years, and included such information as the demographics of each juvenile; his/her score on an AD/HD screening examination, the Conners' Continuous Performance Test; arrest/court history; information from the Child Behavior Checklist and Teacher Reports completed by the juvenile's guardian/teacher; and school performance. It was hypothesized that treating juveniles diagnosed with AD/HD would lower juvenile delinquency, or the number of arrests. In addition, the following research questions were asked:

- Who are these youth in the program?
- What kind of offenses do they commit?
- Does school performance improve once treatment of AD/HD is conducted?

This chapter is divided into a number of sections, and includes a description of all study participants; participants in both the control and treatment groups; and how the control and participant groups were and were not similar. This chapter concludes with a discussion of the results regarding the research hypothesis and questions, and the analyses conducted. The following section is a description of all program participants included in the evaluation.

Description of the Sample Group

Gender of Sample Group

There were a total of 46 juveniles included in the program evaluation. Males were over-represented in the evaluation, with 73.9% (n = 34) of the group being male and 26.1% (n = 12) being female. This information can be found in Table 1.

Table 1

Gender Distribution: Sample Group

Gender	# of Juveniles in Sample	Percent of Sample
Male	34	73.9%
Female	12	26.1%
Total	46	100.00%

This is reflective of the population of the juvenile detention center. Males and minorities are over-represented.

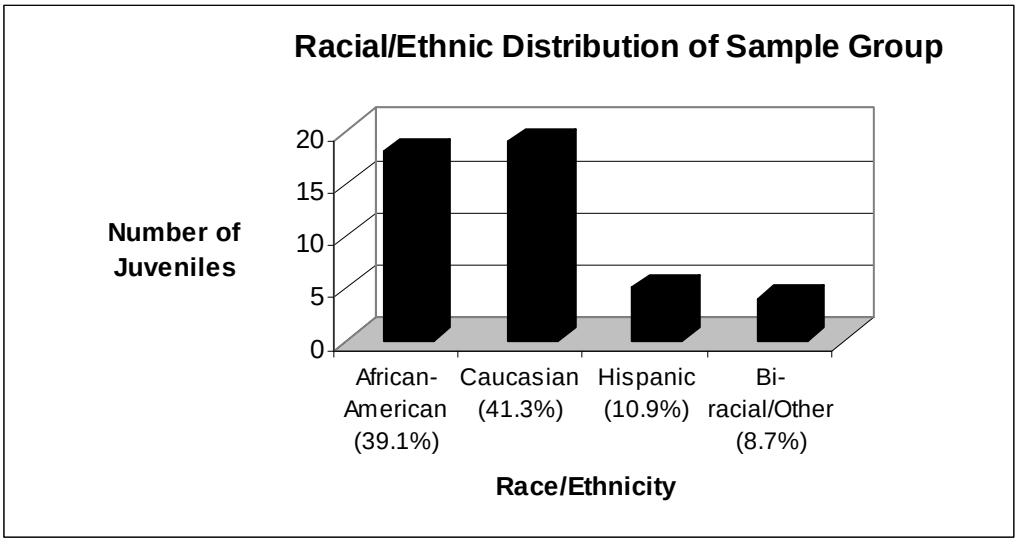
Race/Ethnicity of the Sample Group

The racial/ethnic distribution of the juveniles was also collected during program participation. There were four possible categories of race/ethnicity: African-American or black, Caucasian or white, Hispanic, and Bi-racial/Other. The "Other" option was for

those juveniles who were of two races, such as African-American and Caucasian, and those who were of a race that was not listed. The majority of the participants were Caucasian or white, with 41.3% (n = 19) of the sample being classified as white. African-Americans composed 39.1% (n = 18) of the sample. Hispanic and Bi-racial/Other juveniles composed the rest of the sample, with 10.9% (n = 5) being classified as Hispanic and 8.7% (n = 4) listed as Bi-racial/Other, respectively. The racial/ethnic distribution of the entire sample can be found in Figure 1.

Figure 1

Racial/Ethnic Distribution: Sample Group



Race/ethnicity was also dichotomized into "White" and "Non-white" categories. Non-white included African-American, Hispanic, and Bi-racial/Other. Descriptive

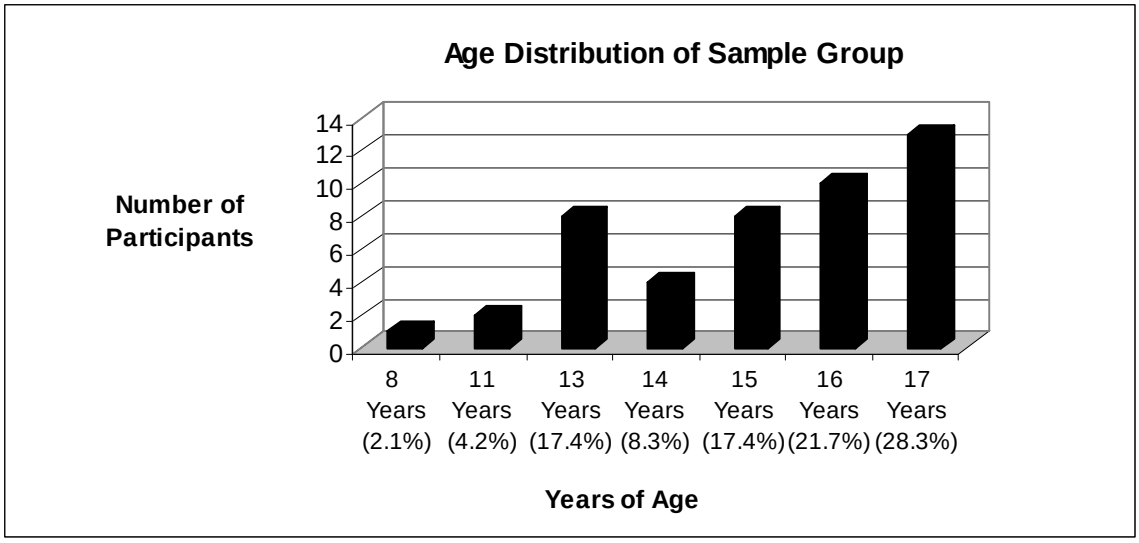
statistics revealed that non-white juveniles were over-represented in the sample, with over *half* of the sample (58.7%, n = 27) categorized as "Non-white." Caucasian or white juveniles comprised only 41.3% (n = 19) of the sample.

Age of the Sample Group

The juvenile's age at the time of his/her arrest ranged from eight years of age to 17 years of age. The mean age of the sample was approximately15 years, with a median age of 15 years and six months old. Of the 46 total juveniles, the largest age group of participants was 17 years of age (28.3%, n = 13). The next largest group of participants were 16 years of age (21.7%, n = 10), followed by 13 years of age (17.4%, n = 8), 15 years of age (17.4%, n = 8), and 14 years of age (8.3%, n = 4). The age groups with the smallest number of participants were 11 years of age (4.2%, n = 2) and 8 years of age (2.1%, n = 1). See Figure 2.

Figure 2

Age Distribution: Sample Group



CPT II Score

The CPT II scores for the sample ranged from 0.10 to 99.9, with an average score of 59.12. Any score over a 50% is considered a score in the clinical range, where the score is similar to other individuals with AD/HD. The median CPT II score was 60.9.

Offense at Time of Arrest

Type of offense at arrest was also collected and analyzed. The juveniles in the sample were arrested for personal, property, and public order offenses. Status offenses

were categorized as public order offenses. Not all participants were arrested immediately prior to joining the program, if the juvenile was arrested at all. There were a number of juveniles who were arrested numerous times in the past, but had no arrests within two months of the program. There were also juveniles who had never been arrested or officially charged with a crime. Some juveniles were referred to the program through Magistrates, Probation Officers, the Juvenile Court Judge, or others from the Court, or were referred to the program by his/her parents (parental request).

The majority of the juveniles were not arrested and charged with an offense immediately prior to the start of program participation (39.1%, n = 18). These juveniles were referred to the program because of a number of prior offenses, or in lieu of official charges, or joined the program because of parental request. Domestic Violence was the next largest offense category, with seven juveniles being charged with that offense (15.2% of the sample). This category was followed by charges of Unruly (13.0%, n = 6), and Breaking and Entering (6.5%, n = 3). Other offenses included, but are not limited to: Carrying a Concealed Weapon, Receiving Stolen Property, Aggravated Menacing, Operating an Unsafe Vehicle, and Truancy. The complete list of offenses and their frequencies can be found in Table 2.

Table 2

Offense at Time of Arrest: Sample Group

Arrest Offense	# of Juveniles in Sample	Percent of Sample
No Arrest at Program Start	18	37.5%
Domestic Violence	7	14.6%
Unruly	6	12.5%
Breaking & Entering	3	6.3%
Carrying a Concealed Weapon	1	2.2%
Receiving Stolen Property	1	2.2%
Aggravated Menacing	1	2.2%
Operating an Unsafe Vehicle	1	2.2%
Acting in Contempt of Court	1	2.2%
Theft	1	2.2%
Parole Violation	1	2.2%
Walking Along the Highway	1	2.2%
Day Reporting Violation	1	2.2%
Transfer in From Another Court	1	2.2%
Order of Apprehension	1	2.2%
Truancy	1	2.2%
Total	46	100%

Number of Arrests

Data were collected on whether or not the juveniles in the sample had any prior offenses at any time before joining the program. It was discovered that 78.3% (n = 36) of the sample had at least one prior offense, with only 21.7% (n = 10) of the sample *not* having an arrest/court history. This information is located in Table 3.

Table 3

Prior Offenses: Sample Group

Prior Offenses	# of Juveniles in Sample	Percent of Sample
None	10	21.7%
Other Offenses	36	78.3%
Total	46	100.0%

Data were also collected on the number of arrests six months prior to and six months following participation in the program. The number of arrests prior to the program ranged from zero to seven, with the majority of juveniles not having been arrested within six months before starting the program (43.5%, n = 20). For the juveniles who had been arrested six months prior to joining the program, the majority experienced one arrest (32.6%, n = 15). Six juveniles were arrested two times (13.0%), two juveniles were arrested three times (4.3%), and two juveniles were arrested four times (4.3%).

Only one juvenile was arrested seven times (2.2%). Data on arrests six months prior to program participation can be found in Table 4.

Table 4

Number of Arrests Prior to Program: Sample Group

Number of Arrests	# of Juveniles in Sample	Percent of Sample
0	20	43.5%
1	15	31.3%
2	6	13.0%
3	2	4.3%
4	2	4.3%
7	1	2.2%
Total	46	100%

Data gathered on the number of arrests six months following program participation, including those who did not complete the program, showed that over half of the juveniles did not experience an arrest after they had either completed or were terminated from the program (60.9%, n = 28). Juveniles that were arrested after having been involved with the program mostly experienced one arrest (21.7%, n = 10). Two juveniles were arrested two times (4.3%), one juvenile was arrested three times (2.2%), and three juveniles were four times (6.5%). Only two juveniles were arrested six times

following his/her participation in the program (4.3%). Data on the number of arrests six months following involvement with the program are located in Table 5.

Table 5

Number of Arrests Following Program: Sample Group

Number of Arrests	# of Juveniles in Sample	Percent of Sample
0	20	43.5%
1	15	31.3%
2	6	13.0%
3	2	4.3%
4	2	4.3%
7	1	2.2%
Total	46	100%

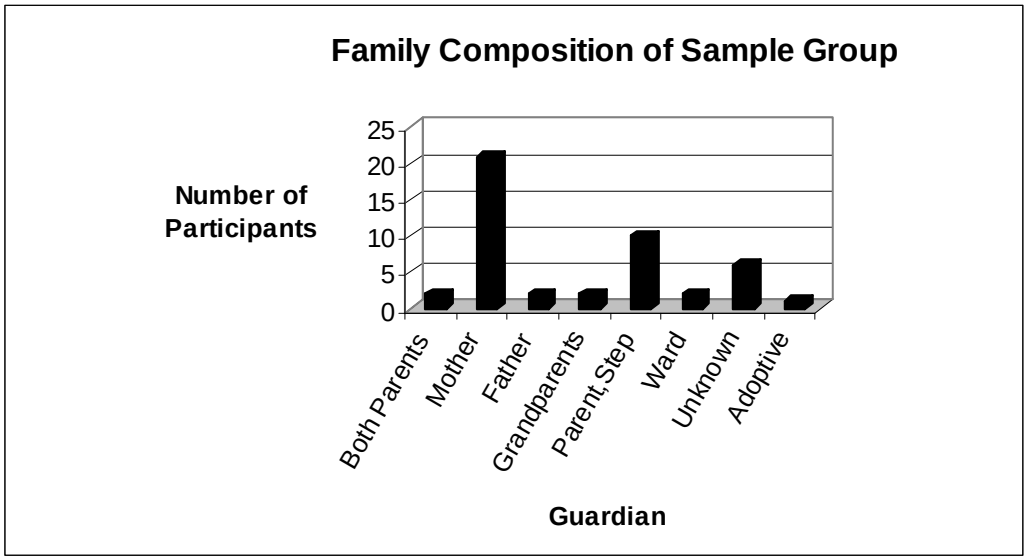
Family Composition

The composition of the juvenile's family was recorded. This included such information as if he/she was living with both biological parents, with the biological mother only, with the biological father only, etc., at the time of program involvement. The majority of the juveniles lived with his/her biological mother only (45.7%, n = 21), followed by living with a parent and a step-parent (21.7%, n = 10). Other juveniles lived with both of his/her biological parents (4.3%, n = 2), grandparents (4.3%, n = 2), or were

a ward of the state (4.3%, n = 2), among others. There were six cases where the family composition was unknown (13.0%). This information can be found in Figure 3.

Figure 3

Family Composition: Sample Group



Family composition was dichotomized into "Living with Mother and Others" and "Living with Mother Only." Living with Mother and Others represented those juveniles who lived with their biological mothers in addition to another adult, such as grandparents or a step-parent. Living with Mother Only represented those juveniles who lived only with their biological mother. Analysis showed that most of the juveniles lived with their biological mother and other adults (54.3%, n = 25). Juveniles living only with their biological mother represented 43.8% of the sample (n = 21).

Type of School

School information was collected, in particular the type of school the juvenile attended. Type of school was categorized into public school (elementary, junior high, or high school); home schooling; life skills; alternative school; vocational school; kindergarten through eighth grade, public; and not currently attending school. Half of the sample attended public high school (50.0%, n = 23), while 17.4% (n = 8) attended public junior high, and 6.5% (n = 3) attended an alternative school. The remaining juveniles experienced the other types of school listed above, with two juveniles in each category. Refer to Table 6 for data regarding the type of school each juvenile attended.

Table 6

Type of School: Sample Group

Type of School Attended	# of Juveniles in Sample	Percent of Sample
High School – Public	23	50.0%
Junior High – Public	8	17.4%
Alternative School	3	6.5%
Elementary – Public	2	4.3%
Home School	2	4.3%
Life Skills	2	4.3%
Vocational School	2	4.3%
K through 8 – Public	2	4.3%
Not Attending	2	4.3%
Total	46	100.0%

Child Behavior Checklist and Teacher Report

Information regarding the presence and frequency of behavioral problems, and symptoms of AD/HD, was gathered from the Child Behavior Checklists (CBCLs) and Teacher Reports. This information was gathered from the parent/guardian and teacher(s) of the juvenile. Since the information was similar, the data were combined. These forms can be found in Appendix A and Appendix B. CBCLs and Teacher Reports were not available for every juvenile. Because of the number of questions in the forms, only those variables (behaviors) that were listed as a problem or concern by the parent/teacher are discussed. The variables or behaviors that parents/teachers felt were a problem for the juveniles are listed below:

- Argues – 37.8% of the research population
- Fails to finish work – 41.7% of the research population
- Cannot concentrate – 54.1% of the research population
- Obsessions – 41.7% of the research population
- Hyperactive – 38.9% of the research population
- Breaks rules at home, school – 38.9% of the research population
- No guilt – 31.4% of the research population
- Hangs around with others in trouble – 42.9% of the research population
- Impulsive – 36.1% of the research population
- Apathetic or unmotivated – 30.0% of the research population
- Poor school work – 40% of the research population
- Inattentive, easily distracted – 37.1% of the research population

- Stubborn, sullen, or irritable – 30.6% of the research population
- Underachieving – 44.4% of the research population
- Fails to carry out assigned tasks – 44.4% of the research population

Sample Grade Point Average (GPA) and Days Absent

The mean GPA for the sample, six months prior to program involvement, was 1.6088, with GPAs reported from 0.0000 to 3.095. The median GPA was 1.6000. Six months following program participation, including those who completed the program and those who were terminated, the mean GPA for the sample was 0.8892, with GPAs reported from 0.0000 to 2.2000. The median GPA after program involvement was 1.0000.

Prior to joining the program, the juveniles in the sample missed an average of 20.9 days, with a median number of absences of 18.5. Six months after participation in the program, the sample missed an average of 24.93 days of school, with a median number of absences of 24.50. GPA and absence information was not available on all juveniles. Again, it should be noted that this data is for all juveniles evaluated, control and experimental/treatment.

Withdraw or Graduate From School

There were a number of juveniles who withdrew from school following program participation, with approximately 16.7% of the sample withdrawing from their current

school (n = 8); approximately 83.3% (n = 38) did not withdraw from. Three juveniles (6.3% of the total sample) graduated from high school following participation in the program.

Description of the Control Group

The control group was selected based on the juvenile's early termination from the program due to his/her non-compliance. These juveniles were terminated for reasons such as missing numerous appointments, or not maintaining compliance while taking the medication (i.e., not following through with program requirements). There were a total of 21 juveniles included in the control group.

Gender of the Control Group

There were a greater number of males in the control group, with 90.5% (n = 19) of the group being male and 9.5% (n = 2) being female. This information can be found in Table 7.

Table 7

Gender Distribution: Control Group

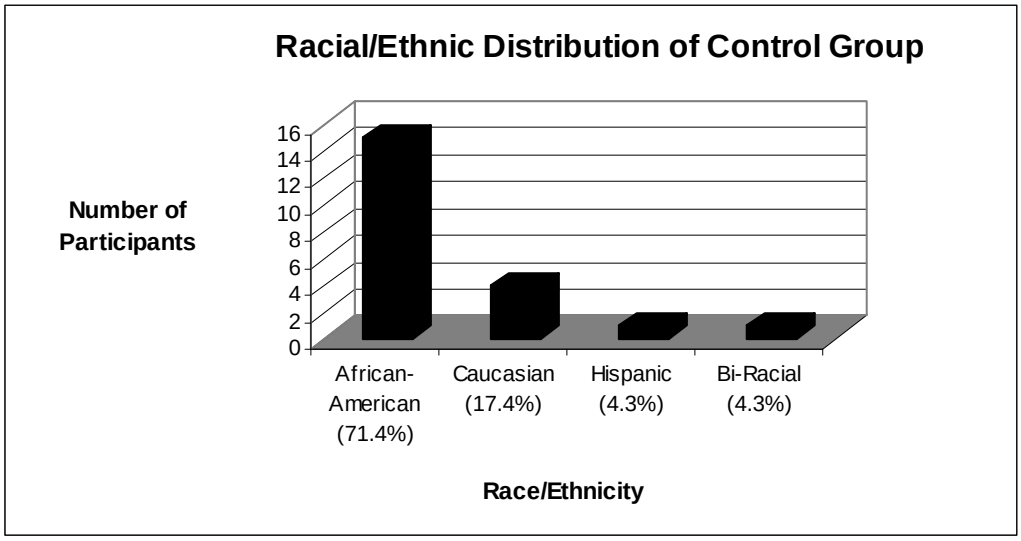
Gender	# of Juveniles in Group	Percent of Group
Male	19	90.5%
Female	2	9.5%
Total	21	100.00%

Race/Ethnicity of the Control Group

Like the total sample of juveniles, the racial/ethnic distribution of the juveniles in the control group was analyzed. African-American, or black, juveniles were over-represented in the group, with 71.4% (n = 15) of the juveniles classified as African-American. Caucasian, or white, juveniles composed 19.0% (n = 4) of the control group. Hispanic and Bi-racial/Other categories each contained only one juvenile (4.8% for both races/ethnicities, respectively). The racial/ethnic distribution of the control group can be found in Figure 4.

Figure 4

Racial/Ethnic Distribution: Control Group



Race/ethnicity was dichotomized into "White" and "Non-white" categories. Non-white included African-American, Hispanic, and Bi-racial/Other. Descriptive statistics revealed that non-white juveniles were over-represented in the control group, with 71.4% (n = 14) categorized as "Non-white." Caucasian or white juveniles comprised only 19.0% (n = 4) of the sample.

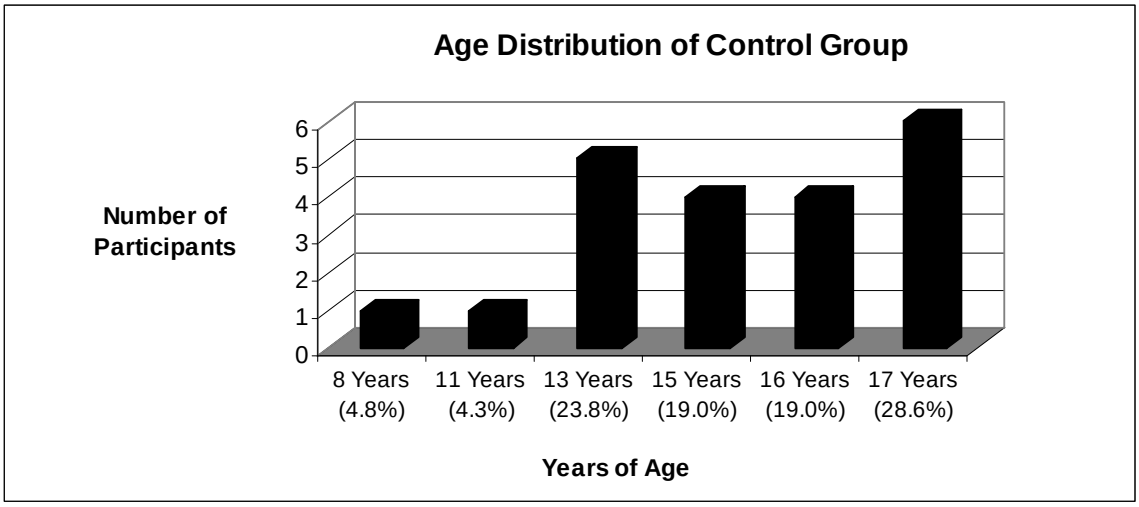
Age Distribution of the Control Group

The mean age of the sample was 14 years and 9 months, with a median age of 15.0 years. Of the 21 total juveniles, the largest age group of participants was 17 years of age (28.6%, n = 6). The next largest group of participants were 13 years of age (23.8%, n

= 5), followed by 15 years of age (19.0%, n = 4); and 16 years of age (19.0%, n = 4). The age groups with the smallest number of participants were 11 years of age (4.2%, n = 2) and 8 years of age (2.1%, n = 1). This information can be found in Figure 5.

Figure 5

Age Distribution: Control Group



CPT II Score

The CPT II scores for the control group ranged from 30.60 to 88.50, with an average score of 59.91. The median score was 58.60.

Offense at Time of Arrest

The most common offense committed by the control group at the time of beginning the program was Domestic Violence, with five juveniles committing the crime

(23.8%). The next common offense for juveniles in the control group was Unruly (19.0%, n = 4), followed by Breaking and Entering (14.3%, n = 3), and being referred to the program (9.5%, n = 2). The remaining offenses were each committed by one juvenile (4.8%, n = 1). Arrest offense information is located in Table 8.

Table 8

Offense at Time of Arrest: Control Group

Arrest Offense	**# of Juveniles in Group**	**Percent of Group**
Domestic Violence	5	23.8%
Unruly	4	19.0%
Breaking & Entering	3	14.3%
No Arrest at Program Start	2	9.5%
Carrying a Concealed Weapon	1	4.8%
Operating an Unsafe Vehicle	1	4.8%
Acting in Contempt of Court	1	4.8%
Walking Along the Highway	1	4.8%
Transfer in From Another Court	1	4.8%
Order of Apprehension	1	4.8%
Truancy	1	4.8%
Total	21	100%

Number of Arrests

Analysis showed that most of the juveniles in the control group had arrest offenses prior to joining the program (76.2%, n = 16). These offenses extend beyond the six-month time period utilized for analysis. Only five juveniles in the group did not have a previous offense before his/her participation in the program (23.8%). Refer to Table 9.

Table 9

Prior Offenses: Control Group

Prior Offenses	# of Juveniles in Group	Percent of Group
None	5	23.8%
Other Offenses	16	76.2%
Total	21	100.0%

Data were also collected on the number of arrests six months prior to and six months following participation in the program for the control group. The number of arrests prior to the program ranged from zero to four, with the majority of juveniles not having been arrested within six months before starting the program (38.1%, n = 8). For the juveniles who had been arrested six months prior to joining the program, the majority experienced one arrest (33.3%, n = 7). Three juveniles were arrested two times (14.3%), two juveniles were arrested three times (9.5%), and one juvenile was arrested four times (4.8%). Data on arrests six months prior to program participation can be found in Table 10.

Table 10

Number of Arrests Prior to Program: Control Group

Number of Arrests	# of Juveniles in Group	Percent of Group
0	8	38.1%
1	7	33.3%
2	3	14.3%
3	2	9.5%
4	1	4.8%
Total	21	100%

Data gathered on the number of arrests six months following program participation showed that an equal number of juveniles were not arrested, or were arrested one time, six months after the program (33.3%, n = 7). Other juveniles that were arrested after having been involved with the program mostly experienced four arrests (14.3%, n = 3). Two juveniles were arrested two times (9.5%), and one juvenile was arrested three times (4.8%). Only one juvenile was arrested six times following his/her participation in the program (4.3%). Data on the number of arrests six months following involvement with the program are located in Table 11.

Table 11

Number of Arrests Following Program: Control Group

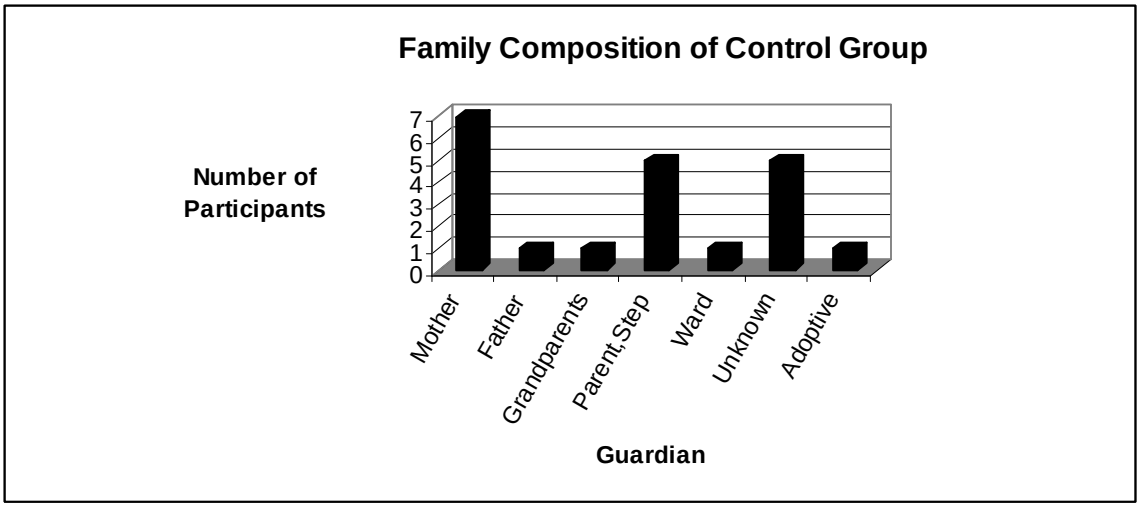
Number of Arrests	# of Juveniles in Group	Percent of Group
0	7	33.3%
1	7	33.3%
4	3	14.3%
2	2	9.5%
3	1	4.8%
6	1	4.8%
Total	21	100%

Family Composition

The majority of the juveniles lived only with his/her biological mother (33.3%, n = 7), followed by living with a parent and a step-parent (23.8%, n = 5). Other juveniles lived with grandparents (4.8%, n = 1), were a ward of the state (4.8%, n = 1), or lived with an adoptive parent (4.8%, n = 1). There were five cases where the family composition was unknown (23.8%). This information can be found in Figure 6.

Figure 6

Family Composition: Control Group



When family composition was dichotomized into "Living with Mother and Others" and "Living with Mother Only," analysis showed that most of the juveniles lived with their biological mother and other adults (66.7%, n = 14). Juveniles living only with their biological mother represented 33.3% of the sample (n = 7).

Type of School

When the type of school was analyzed, results showed that most juveniles in the control group attended public high school (33.3%, n = 7). An equal number of juveniles attended public junior high (14.3%, n = 3), and an alternative school (14.3%, n = 3). The remaining juveniles attended the following types of schools:

- Life Skills (9.5%, n = 2)

- Public school housing kindergarten through eighth grade
- Public elementary school (4.8%, n = 1)
- Home schooling (4.8%, n = 1)

Two juveniles were not currently attending school (9.5% of the control group). Refer to Table 12 for data regarding the type of school each juvenile attended.

Table 12

Type of School: Control Group

Type of School Attended	**# of Juveniles in Group**	**Percent of Group**
High School – Public	7	33.3%
Junior High – Public	3	14.3%
Alternative School	3	9.5%
K through 8 – Public	2	9.5%
Life Skills	2	9.5%
Not Attending	2	9.5%
Elementary – Public	1	4.8%
Home School	1	4.8%
Total	21	100.0%

Child Behavior Checklist and Teacher Report

Information gathered from the CBCLs and Teacher Reports was analyzed for the control group. The behaviors noted as a problem or concern for the parents/guardians and teachers of the juveniles are listed below:

- Argues – 37.5% of the control group
- Fails to finish work – 33.3% of the control group
- Cannot concentrate – 43.8% of the control group
- Obsessions – 40.0% of the control group
- Hyperactive – 53.3% of the control group
- Demands attention – 31.3% of the control group
- No guilt – 33.3% of the control group
- Breaks rules at home, school – 43.8% of the control group
- Hangs around with others in trouble – 60% of the control group
- Impulsive - 31.3% of the control group
- Lying or cheating – 37.5% of the control group
- Bites fingernails – 33.3% of the control group
- Showing off or "clowning" – 37.5% of the control group
- Inattentive, easily distracted – 40.0% of the control group

Control Group Grade Point Average (GPA) and Days Absent

The mean GPA for the control group six months prior to program involvement was 0.9196, with GPAs reported from 0.0000 to 2.1300. The median GPA was 1.0315.

Six months following program participation, the mean GPA for the control group was 0.3136, with GPAs reported from 0.0000 to 1.1300. The median GPA was 0.0833.

Prior to joining the program, the juveniles in the control group missed an average of 24.0 days, with a median number of absences of 23.0. Six months after participation in the program, the control group missed an average of 21.35 days of school, with a median number of absences of 21.00.

Withdraw or Graduate From School

There were a number of juveniles who withdrew from school following program participation, with approximately 13.0% of the control group withdrawing from their current school (n = 3); approximately 87.0% (n = 38) did not withdraw. One juvenile (4.3% of the control group) graduated from high school following participation in the program.

Description of the Treatment Group

The treatment group consisted of those juveniles who had successfully completed the program. In order to successfully complete the program, participants had to remain in the program for at least six months, and had to comply with all program requirements. These requirements include attending scheduled appointments with the program psychiatrist, taking medication as prescribed, and avoiding placement in a residential treatment facility. There were a total of 25 juveniles included in the treatment group.

Gender of the Treatment Group

There were more males in the treatment group, with 60.0% (n = 15) of the group being male and 40.0% (n = 10) being female. This information can be found in Table 13.

Table 13

Gender Distribution: Treatment Group

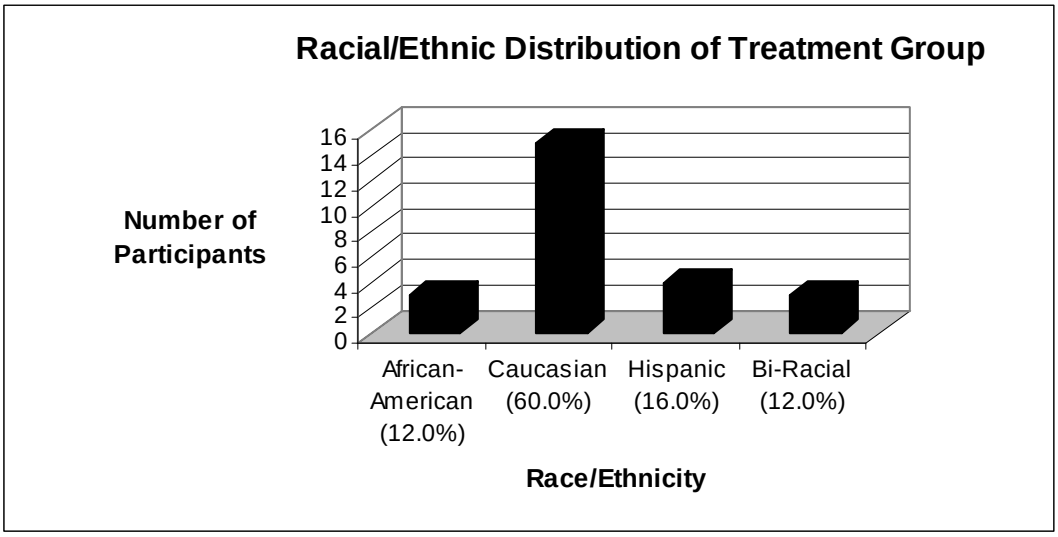
Gender	# of Juveniles in Group	Percent of Group
Male	15	60.0%
Female	10	40.0%
Total	25	100.00%

Race/Ethnicity of the Treatment Group

The racial/ethnic distribution of the treatment group was collected and analyzed, and the majority of the group were Caucasian, or white, juveniles (60.0%, n = 15). Hispanic juveniles were the next largest racial/ethnic group, with16.0% (n = 4) of the treatment group categorized as Hispanic. African-American and Bi-racial juveniles represented an equal amount of the treatment group (12.0%, n = 3). The racial/ethnic distribution of the treatment group can be found in Figure 7.

Figure 7

Racial/Ethnic Distribution: Treatment Group



Race/ethnicity was dichotomized into "White" and "Non-white" categories. Non-white included African-American, Hispanic, and Bi-racial/Other. Descriptive statistics revealed that white juveniles represented the majority of juveniles in the treatment group, with 60.0% (n = 15) categorized as "White." "Non-white" juveniles composed 40% (n = 10) of the treatment group.

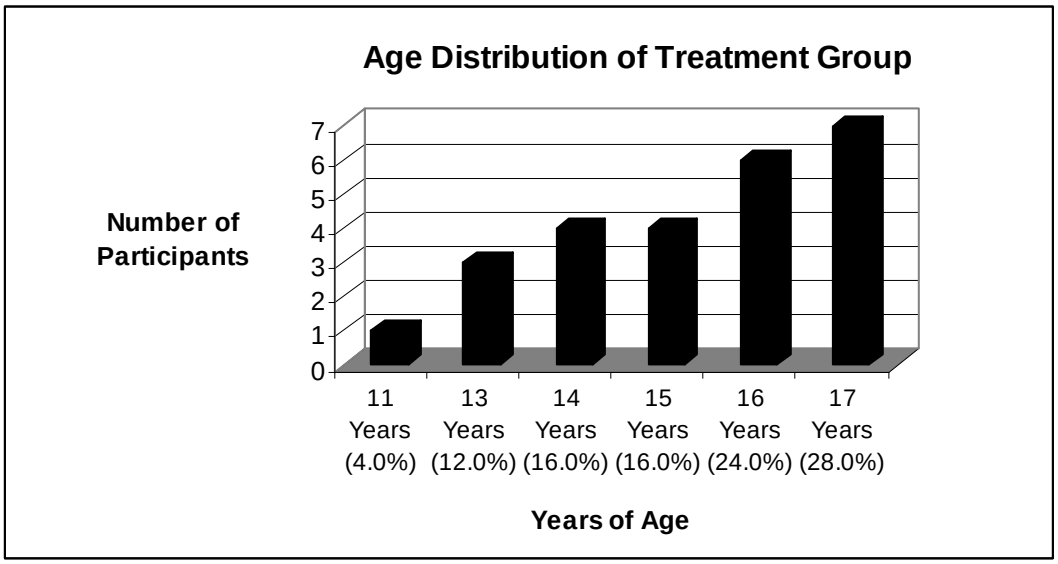
Age Distribution of the Treatment Group

The mean age of the sample was 15 years and 3 months, with a median age of 16.00 years. Of the 25 total juveniles, the largest age group of participants was 17 years of age (28.0%, n = 7). This age group was followed closely by juveniles 16 years of age

(24%, n = 6). The groups of 14 years of age and 15 years of age were represented equally (16.0%, n = 4). The age groups with the smallest number of juveniles were 13 years of age (12.0%, n = 3) and 11 years of age (4.0%, n = 1). Refer to Figure 8 for information regarding age distribution.

Figure 8

Age Distribution: Treatment Group



CPT II Score

The CPT II scores for the treatment group ranged from 0.10 to 99.90, with a mean score of 58.30. The median score was 61.50.

Offense at Time of Arrest

Like the control group, the juveniles in the treatment group were arrested for personal, property, and public order offenses. The majority of juveniles in the treatment group did not commit an offense immediately prior to joining the program, nor were they referred to the program through the Court or by parental request (64.0%, n = 16). Most of the juveniles that did commit an offense committed either Domestic Violence (8.0%, n = 2) or were Unruly (8.0%, n = 2). The remaining offenses were each committed by one juvenile (4.0%, n = 1). Refer to Table 14 for information on arrest offense for juveniles in the treatment group.

Table 14

Offense at Time of Arrest: Treatment Group

Arrest Offense	# of Juveniles in Group	Percent of Group
No Arrest at Program Start	16	64.0%
Unruly	2	8.0%
Domestic Violence	2	8.0%
Receiving Stolen Property	1	4.0%
Day Reporting Violation	1	4.0%
Aggravated Menacing	1	4.0%
Parole Violation	1	4.0%
Theft	1	4.0%
Total	25	100%

Number of Arrests

Similar to the control group, analysis showed that most of the juveniles in the treatment group had arrest offenses prior to joining the program (80.0%, n = 20). These offenses extend beyond the six-month time period utilized for analysis. Only five juveniles in the group did not have a previous offense before his/her participation in the program (20.0%). This information can be found in Table 15.

Table 15

Prior Offenses: Treatment Group

Prior Offenses	# of Juveniles in Group	Percent of Group
None	5	20.0%
Other Offenses	20	80.0%
Total	25	100.0%

Data were also collected on the number of arrests six months prior to and six months after the juvenile participated in the program. The number of arrests prior to program participation ranged from zero to seven, with the majority of juveniles not experiencing arrest within six months before starting the program (48.0%, n = 12). For the juveniles who had been arrested six months prior to joining the program, the majority experienced one arrest (32.0%, n = 8). Three juveniles were arrested two times (12.0%),

one juvenile was arrested four times (4.0%), and one juvenile was also arrested seven times (4.0%). Data on arrests six months prior to program participation can be found in Table 16.

Table 16

Number of Arrests Prior to Program: Treatment Group

Number of Arrests	# of Juveniles in Group	Percent of Group
0	12	48.0%
1	8	32.0%
2	3	12.0%
4	1	4.0%
7	1	4.0%
Total	25	100%

Data gathered on the number of arrests six months after the juvenile had participated in the program showed that most of the juveniles in the treatment group were not arrested again within six months of participation (84.0%, n = 21). Juveniles that were arrested after involvement with the program were arrested once within six months (12.0%, n = 3) and six times within six months (4.0%, n = 1). Data on the number of arrests six months following involvement with the program are located in Table 17.

Table 17

Number of Arrests Following Program: Treatment Group

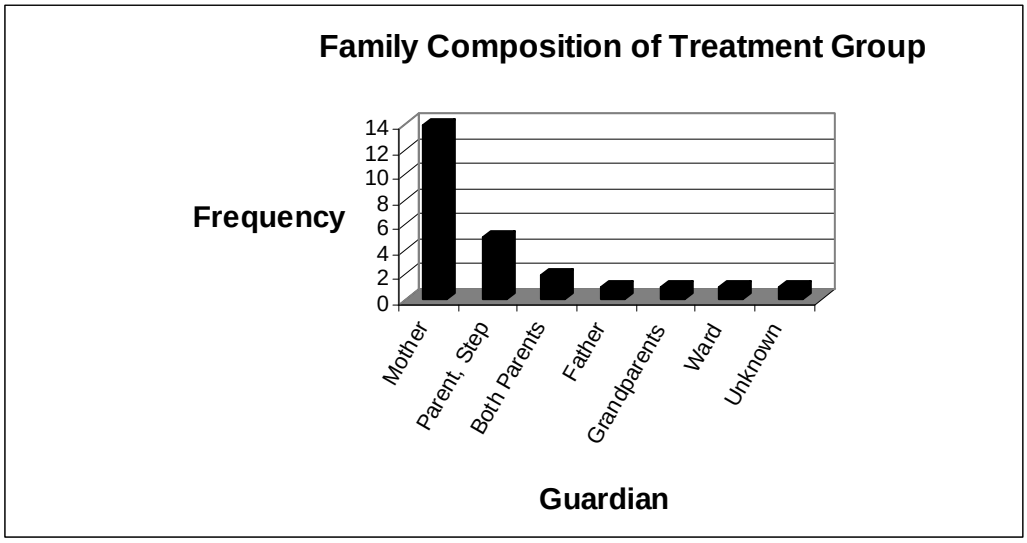
Number of Arrests	# of Juveniles in Group	Percent of Group
0	21	84.0%
1	3	12.0%
6	1	4.0%
Total	25	100%

Family Composition

Juveniles in the treatment group mostly lived only with his/her biological mother (56.0%, n = 14). If the juvenile did not live with his/her biological mother, he/she was most likely to live with his/her parent and a step-parent (20.0%, n = 5). Other juveniles in the treatment group lived with both of his/her biological parents (8.0%, n = 2). One juvenile lived with his/her biological father, his/her grandparents, or were a ward of the state (4.0%, n = 1). There was one case where the family composition was unknown (4.0%). This information can be found in Figure 9.

Figure 9

Family Composition: Treatment Group



When family composition was dichotomized into "Living with Mother and Others" and "Living with Mother Only," analysis showed that most of the juveniles lived only with their biological mother (56.0%, n = 14). Juveniles living with their biological mother and other adults represented 44.0% of the sample (n = 11).

Type of School

Juveniles in the treatment group mostly attended public high school (64.0%, n = 16). The juveniles also attended a public junior high school (20.0%, n = 5), and a vocational school (8.0%, n = 2). The remaining juveniles attended either home schooling

(4.0%, n = 1) or a public elementary school (4.0%, n = 1). Refer to Table 18 for data regarding the type of school each juvenile attended.

Table 18

Type of School: Treatment Group

Type of School Attended	# of Juveniles in Sample	Percent of Sample
High School – Public	16	64.0%
Junior High – Public	5	20.0%
Vocational School	2	8.0%
Elementary – Public	1	4.0%
Home School	1	4.0%
Total	25	100.0%

Child Behavior Checklist and Teacher Report

Information gathered from the CBCLs and Teacher Reports was analyzed for the treatment group. The behaviors noted as a major problem or concern for the parents/guardians and teachers of the juveniles are listed below:

- Argues – 38.1% of the treatment group
- Fails to finish work – 47.6% of the treatment group
- Cannot concentrate – 61.9% of the treatment group

- Obsessions – 42.9% of the treatment group
- Disobedient at home – 30.8% of the treatment group
- Breaks rules at home, school – 35.0% of the treatment group
- Impulsive – 40.0% of the treatment group
- Apathetic or unmotivated – 37.5% of treatment group
- Poor school work – 50% of the treatment group
- Inattentive, easily distracted – 35.0% of the control group
- Stubborn, sullen, irritable – 40.0% of the treatment group
- Underachieving – 57.1% of the treatment group
- Fails to carry out assigned tasks – 57.1% of the treatment group
- Dislikes school – 33.3% of the treatment group
- Worries – 35% of the treatment group

Treatment Group Grade Point Average (GPA) and Days Absent

The mean GPA for the treatment group six months prior to program participation was 1.8538, with GPAs reported from 0.0000 to 3.0950. The median GPA was 2.2310. Six months after participating in the program, the mean GPA for the treatment group was 0.9199, with GPAs reported from 0.0000 to 2.2000. The median GPA was 1.0465.

Before the juveniles in the treatment group joined the program, he/she missed an average of 16.93 days, with a median number of absences of 16.00. Six months after participating in the program, the treatment group missed an average of 29.83 days of

school, with a median number of absences of 32.50. GPA and absence information was not available on all juveniles in the treatment group.

Withdraw or Graduate From School

After participating in the program, there were some juveniles who withdrew from schooling, and did not enroll in another school in the area. Of the treatment group, 20.0% (n = 5) of the juveniles withdrew from their current school. The majority of the treatment group did not withdraw from school (80.0%, n = 20). Two juveniles (8.0% of the treatment group) graduated from high school following program involvement.

Chi-Square Analysis of Control and Treatment Groups

Data were collected to determine the degree of similarity between the control and treatment groups. When examining the Child Behavior Checklists (CBCLs) and Teacher Reports, chi-square tests showed that these two groups did not significantly differ in terms of the presence and frequency of most behavioral issues, many of which were indicative of AD/HD. There was one behavior that was significantly different between the treatment and control groups. This difference will be discussed at a later point. CPT II scores also did not significantly differ between the treatment and control groups. The mean CPT II score for the control group was 59.91, and the mean CPT II score for the treatment group was 58.30.

The fact that the CBCLs, Teacher Reports, and CPT II scores did not significantly differ between groups makes the assignment of juveniles to control and participant groups valid. In terms of symptoms of AD/HD, the two groups did not differ: problem behaviors reported by parents and teachers were similar, as were the CPT II scores (which are used as an AD/HD screening device). If the two groups were significantly different in terms of behaviors indicative of AD/HD and CPT II scores, the true results of the program may be skewed because of the original differences between groups.

There was one behavior on the CBCLs and Teacher Reports that was significantly different between the control and treatment groups: showing off or "clowning." A chi-square test showed that juveniles in the treatment group were more likely to be classified as a class clown than were juveniles in the control group. The results of the chi-square test can be found in Table 19.

Table 19

Crosstabulation: Showing off, Clowning

	Control	Treatment	Total
Not a Problem or Only Somewhat	N = 10 62.5%	N = 19 95.0%	N = 29 80.6%
A Concern or Problem	N = 6 37.5%	N = 1 5.0%	N = 7 19.4%
Total	N = 16 100.0%	N = 20 100%	N = 36 100.0%

$\chi^2 = 5.99$, df = 1, p = 0.030

Gender

Chi-square tests were completed to analyze research group and gender. It was discovered that there was a significant difference in gender between the treatment and control groups. Males were over-represented in the control group, and females were over-represented in the treatment group. It was expected that 73.9% of the control would be male based on the number of juveniles in the group, but chi-square analysis showed that 90.5% (n = 19) of the control group was male, an over-representation. Further, it was expected that 26.1% of the treatment group would be female, but chi-square analysis reported that 40.0% (n = 10) of the treatment group was female. This can be seen in Table 20.

Table 20

Crosstabulation: Gender and Research Group

Gender	Control	Treatment	Total
Male	N = 19 90.5%	N = 15 60.0%	N = 34 73.9%
Female	N = 2 9.5%	N = 10 40.0%	N = 12 26.1%
Total	N = 21 100.0%	N = 25 100.0%	N = 46 100.0

$\chi^2 = 5.50$, df = 1, p = 0.019

Race/Ethnicity

The racial/ethnic differences between the control and treatment groups were investigated using a chi-square test. Results showed a significant difference between the control and treatment groups in regards to race/ethnicity. African-Americans, or blacks, were over-represented in the control group, and all other races/ethnicities were over-represented in the treatment group. For instance, African-Americans were expected to represent approximately 39.1% of the control group, when in actuality they comprised 71.4% (n = 15) of the control group, an over-representation. Further, Caucasians were expected to represent 41.3% of the treatment group but actually constituted 60.0% (n = 15). Information regarding the results of the chi-square analysis of race/ethnicity can be found in Table 21.

Table 21

Crosstabulation: Race/Ethnicity and Research Group

Race/Ethnicity	Control	Treatment	Total
African-American	N = 15 71.4%	N = 3 12.0%	N = 18 39.1%
Caucasian	N = 4 19.0%	N = 15 60.0%	N = 19 41.3%
Hispanic	N = 1 4.8%	N = 4 16.0%	N = 5 10.9%
Bi-Racial/Other	N = 1 4.8%	N = 3 12.0%	N = 4 8.7%
Total	21	N = 25	N = 46

	100.0%	100.0%	100.0%

$\chi^2 = 16.95$, df = 3, p = 0.001

The category of race/ethnicity was dichotomized, and a chi-square test was utilized to determine any significant differences between white and non-white juveniles. The results of the chi-square test showed that non-white juveniles were over-represented in the control group, with approximately 81.0% (n = 17) of the control group dichotomized as non-white (percent was expected to be 58.7%). Further, white juveniles were over-represented in the treatment group: 60.0% (n = 15) of the group, expected to be approximately 41.3%. Data regarding the chi-square analysis of white and non-white juveniles can be located in Table 22.

Table 22

Race/Ethnicity Dichotomized and Research Group

White or Non-white	Control	Treatment	Total
Non-white	N = 17 81.0%	N = 10 40.0%	N = 27 58.7%
White	N = 4 19.0%	N = 15 60.0%	N = 19 41.3%
Total	N = 21 100.0%	N = 25 100.0%	N = 46 100.0%

$\chi^2 = 7.895$, df = 1, p = 0.007

T-Test Analysis of Treatment and Control Group

Number of Prior Arrests

A t-test was completed to determine any significant differences between the control and treatment groups in terms of arrests six months prior to program involvement. The average number of arrests six months prior to program participation for the control group was 1.10 arrests (sd = 1.179). The average number of arrests for the treatment group prior to the program was 1.00 arrest (sd = 1.581). The analysis showed that there was no statistically significant difference between the control and treatment groups in terms of prior arrests ($F = 0.040$, $p = 0.842$).

Number of Arrests Following Program

The number of arrests six months after program participation was analyzed using a t-test. The mean number of post-program arrests for the control group was 1.52 (sd = 1.721). The mean number of arrests following the program for the treatment group was 0.36 (sd = 1.221). Results showed that there *was* a statistically significant difference between the control and treatment group in terms of the number of arrests six months after the juvenile participated in the program ($F = 6.213$, $p = 0.017$).

Age at Time of Arrest

The juvenile's age at the time of his/her arrest in both the control and treatment groups was analyzed. The mean age at time of arrest for the control group was 14 years

and 9 months ($\bar{x}$ = 14.76, sd = 2.364). The mean age at time of arrest for the treatment group was 15 years and 3 months ($\bar{x}$ = 15.24, sd = 1.640). T-test analysis revealed that there was no statistically significant difference between the control and treatment group when examining the juvenile's age at the time of his/her arrest (F = 2.031, p = 0.161), again supporting validity and reliability of group assignments.

Days Absent At Arrest

As part of school performance, the number of school absences experienced by the juvenile at the time of his/her arrest was investigated. The mean number of absences of juveniles in the control group was 24.00 days of school (sd = 15.67). The mean number of absences of juveniles in the treatment group was 16.93 days of school (sd = 13.65). According to results of the t-test, there were no statistically significant differences between the control group and treatment group regarding the number of school absences at the time of the juvenile's arrest (F = 0.994, p = 0.329).

Days Absent After Program

School information was collected to determine the number of school absences experienced by the juvenile six months after he/she participated in the program. The mean number of absences for the control group was 21.34 school days (sd = 13.98). The mean number of absences for the treatment group was 16.93 days of school (sd = 13.65). T-test analysis showed that, like the number of absences at the juvenile's arrest, there

were no statistically significant differences between the control and treatment groups in terms of the number of absences following program participation (F = 0.607, p = 0.444).

Grade Point Average (GPA) At Arrest

School information collected also included the juvenile's GPA at arrest, which was analyzed utilized a t-test. The mean GPA of juveniles in the control group at the time of his/her arrest was 0.9196 (sd = 0.8041). The mean GPA of juveniles in the treatment group at the time of arrest was 1.8537 (sd = 0.9621). It was discovered that there was no statistically significant difference between the control and treatment groups when examining GPA at the time of arrest (F = 0.122, p = 0.730).

GPA After Program Participation

GPA was also collected six months after the juvenile had participated in the program. The mean GPA for the control group six months following program involvement was 0.3136 (sd = 0.9621). The mean GPA for juveniles in the treatment group six months after program participation was 0.9199 (sd = 0.7769). Results from the t-test analysis showed that there *was* a statistically significant difference in post-program GPA between the control group and treatment group juveniles (F = 6.768, p = 0.016). Both groups showed a decline in their GPAs.

H_1 – Research Hypothesis

The hypothesis of this research project was that treating the symptoms of AD/HD will lower juvenile delinquency, or the number of arrests experienced by the juvenile. According to results from an in-depth analysis, the program designed to treat AD/HD did in fact lessen juvenile delinquency in this sample. Results from a t-test analysis showed that the juveniles in the treatment group were arrested significantly fewer times than the juveniles in the control group six months after participation in the program. The juveniles in the treatment group were those who successfully completed the program and its requirements; the juveniles in the control group were those who were removed from the program because of non-compliance with program requirements. Therefore, it can be concluded from the data that the program successfully lowered delinquency in this sample of juveniles. The research hypothesis (H_1) was supported.

Research Questions

The following research questions were asked:

- Who are these youth in the program?
- What kind of offenses do they commit?
- Does school performance improve once treatment of AD/HD is conducted?

Who Are the Youth in the Program?

The juveniles in the sample were mostly male, Caucasian, and were 17 years of age at the time of arrest. The biological mother was most likely to have custody of the juvenile, with juveniles in the sample more likely to live only with the biological mother. Further, the juveniles were more likely to attend a public high school. Juveniles the in treatment group were more likely to be male and African-American, who were both over-represented in the group. Juveniles in the control group were more likely to be female and Caucasian.

What Kind of Offenses Do They Commit?

Juveniles in the sample were likely to have been arrested at least one time in the past, but not to have been arrested within six months prior to program participation. Most of the juveniles in the sample were referred to the program by Court officials or by parent request. While the juveniles in the program committed personal, property, and public order offenses, juveniles who were arrested were most likely to be arrested and charged with Domestic Violence and being Unruly. Other offenses include Breaking and Entering, Receiving Stolen Property, and Carrying a Concealed Weapon.

Does School Performance Improve Once Treatment of AD/HD Is Conducted?

After utilizing t-tests to determine whether or not school performance improved after treatment in the program, results showed that school performance did not improve

for either group. There was a significant difference between the two groups, but the information was not positive. There are several possible reasons for the decline in GPA. Perhaps the adjustments to the medication, changes in curriculum, moving to an independent curriculum program, or providing the juveniles with an excuse to not try harder was one of the explanations for the lack of improvement in school performance. The juveniles may see themselves as AD/HD victims who will not succeed academically.

Summary

Chapter four contained an in-depth discussion on the analysis and results of the research project. Based on the results of the analyses, the research hypothesis was supported. Treating the symptoms of AD/HD through participation in a program, designed specifically to treat AD/HD, lowered the number of arrests experienced by juveniles in the sample.

The research questions proposed in the project were also discussed. The youth involved with the program were mostly male, Caucasian or white, and were 17 years of age. The juveniles in the sample committed personal, property, and public order offenses. Most juveniles were referred to the program through a Court source, or by parent request, and were not arrested immediately prior to joining the program. The juveniles who were arrested prior to joining the program, however, were most likely to have been arrested and charged with Domestic Violence and being Unruly. As for the third research question, school performance for the juveniles who successfully completed the program experienced a decrease in this school performance.

The final chapter will summarize the major findings from the research project. It will also discuss the strengths and limitations of the study, in addition to suggestions for future research.

Chapter 5

Conclusions and Discussion

This research project evaluated the effectiveness of a program that was designed to treat the symptoms of AD/HD in the hopes of lessening juvenile delinquency, or the number of arrests experienced by the juveniles in the sample. AD/HD has been linked with juvenile delinquency throughout the research literature (Babinski, Hartsough, & Lambert, 1999; Mannuzza, Klein, Abikoff, & Moulton, 2004; Eyestone & Howell, 1994). Evidence has shown that the core symptoms of AD/HD (hyperactivity, impulsivity, and inattention) may lead a juvenile to engage in delinquent behavior. It is therefore logical that treating the symptoms of AD/HD may in fact lessen the juveniles' involvement in behavior that could result in contact with the court system.

Hypothesis and Research Questions

The hypothesis of the research study was that treating the symptoms of AD/HD, through participation in the program, would lessen the juveniles' involvement with the court system, or lower the number of arrests experienced by the juveniles. In addition, there were also a number of research questions. These research questions were:

- Who are these youth in the program?
- What kind of offenses do they commit?
- Does school performance improve once treatment of AD/HD is conducted?

Findings support the research hypothesis, that treating the symptoms of AD/HD lower juvenile delinquency. Results from a t-test analysis indicated that the number of arrests experienced by the juveniles in the treatment group (i.e., the juveniles who successfully completed the program) was significantly lower than the number of arrests experienced by the control group six months after program involvement. This finding supports research stating that treating the symptoms of AD/HD may lower the likelihood of a juvenile engaging in delinquent behavior. Because the symptoms of the disorder were treated, the juveniles may have been less apt to engage in delinquent behavior, and therefore less likely to encounter law enforcement and arrest.

Research Question 1

The juveniles in the program were mostly Caucasian males, and were 17 years of age at the time of his/her arrest. The juveniles were most likely to live only with their biological mother, and attend public high school. Males were over-represented in the control group, and females were over-represented in the treatment group. This may be due to a variety of reasons. It could be that females may be more apt to follow through with program requirements, or because the females' symptoms were less severe (as some research shows) and allowed them to better-follow program requirements, including the medication regimen.

Non-white juveniles in the sample were over-represented in the control group, the group that did not successfully complete the program. This finding is consistent with other research stating that minorities, in particular African-Americans, are less likely to receive treatment for their AD/HD. Explanations have been proposed for the inequality

in AD/HD treatment, which have included the parents and other family members not taking part in the treatment process, and the parents not viewing the disorder as serious enough to warrant treatment.

Research Question 2

The juveniles in the program committed personal, property, and public order offenses. Most of the participants had an offense history, but were referred to the program through the Court or parent request; they were not arrested immediately prior to joining the program. The juveniles that were arrested before program initiation were most likely to be arrested and charged with Domestic Violence or for being Unruly. Other offenses committed by the juveniles included Carrying a Concealed Weapon, Receiving Stolen Property, Theft, Parole Violation, and Aggravated Menacing, among others.

Research Question 3

The final question investigated was whether or not school performance improved after treatment of AD/HD symptoms occurred. There was no statistically significant difference between the control and treatment groups regarding GPA six months prior to joining the program. However, there was a significant difference in post-program GPA. GPA for both the treatment and control groups decreased, although the decrease in GPA for the treatment group was less than the decrease for the control group. This is evidence that school performance did not improve after program participation.

If not dealt with properly, the lack of improvement in school performance may inadvertently lead to additional problems in the future. The mean GPA for both groups was very low. The control group had a mean GPA of 0.3136, and the treatment group had a mean GPA of 0.9199. If this low school performance does not improve, and is allowed to continue, the juvenile may have a difficult time moving to a higher grade level. Not graduating from high school will only make it harder to lead a productive life in adulthood.

The lack of improvement in school performance, which may lead to poor school achievement, has also been linked to juvenile delinquency (Schmalleger & Bartollas, 2008). When a juvenile continuously does poorly in his/her schoolwork, he/she is more likely to lose interest in school and stop trying to achieve good grades. When the juvenile stops paying attention to the teacher and his/her schoolwork, he/she may then become a distraction to other members in the classroom. Eventually, the classmates may socially reject the juvenile because of the disruptions he/she causes. This peer rejection may then lead to the juvenile acting out, sometimes by engaging in delinquent behavior. The more delinquent behavior in which the juvenile participates, the greater the likelihood of him/her getting arrested. What is occurring is a cycle, where poor school achievement leads to peer rejection and juvenile delinquency (Schmalleger & Bartollas, 2008). Improving school performance, or helping the juvenile to achieve academically, may lower the likelihood of the juvenile becoming a delinquent.

Strengths of the Study

The major strength of this research project was that the correlation between AD/HD and juvenile delinquency was reaffirmed. Not only may the core symptoms of AD/HD lead a juvenile to engage in delinquent behavior, the symptoms also affect the juvenile in his/her everyday lives. It affects school performance and achievement, and may even affect the juvenile in his/her social lives, often affecting the development and maintenance of necessary social relationships. Approximately 50% of juveniles with AD/HD will experience symptoms in adulthood. Participation in the program, however, may decrease the chances that the juveniles will experience continued symptoms.

Results of the analysis showed that delinquency was lowered, evidenced by a decrease in the number of arrests experienced by the treatment group, which will benefit not only the juvenile, but their family and the community. Decreased juvenile delinquency may also help to reduce the chances of adult criminality. The more the rate of juvenile delinquency is lowered, the less harm that is caused to the communities where these juveniles live, and the more money that is saved. This decreased spending on juvenile delinquency can allow funding to be placed in other areas needing aid, such as funding for inner-city schools.

While this population is not representative of the nation's juveniles, this research project shows that there is an association between AD/HD and delinquency, and treating one can affect the other. Because this program was shown to be successful in reducing delinquency for the juveniles in the treatment group, the program may be replicated and may even become the foundation for a best practice in the Criminal Justice discipline,

and eventually become a normal practice throughout the state. Caution must be exercised. Although the research showed a decrease in school performance, this may only be a temporary symptom while medication and treatment are perfected. Treating AD/HD often requires experimenting until the best options is found for the juvenile. Replications, and positive results, of this research project may even be used as evidence in the attempt to gain funding from the government, in order to treat AD/HD (and thus lower delinquency) in a particular county or state. Treating AD/HD will not solve all of the state's delinquency problems, but it may help to lower a good portion of delinquent behavior in juveniles, a population that is extremely important to the future of the state.

Limitations of the Study

There are a number of limitations to this research project. First, many of the adolescents, especially those were who terminated from the program, did not follow the medication regimen set by the psychiatrist. According to the program psychiatrist, one may see the effects of the medication after two weeks. However, in order for the medication to fully take effect, the child needs to take the medication daily (i.e., as prescribed). There were some juveniles who simply did not cooperate and take the medication each day. This may have skewed the effectiveness of the program, in that the program may actually be much more effective than the results have shown if more of the juveniles had correctly followed the medication regimen.

Parental involvement was also a limitation of the study. There were many instances where the parent was not available to take the juvenile to the appointment, due

to lack of transp2ortation, having to work, or because the parent forgot about the appointment, even after a phone call and a mailed appointment reminder. In addition, there was also a lack of family engagement at some points in the program. In order for a juvenile to get successful treatment for his/her illness, he/she needs the help of the whole family, not just the parents, because AD/HD affects the entire family. Brothers and sisters should be supportive of their sibling's treatment and should not ridicule him/her because he/she is taking medication. Further, if a parent cannot take the juvenile to the scheduled appointment, an older sibling or family member, such as an aunt, uncle, or grandparent should transport him/her. Missing a series of appointments, which is grounds for removal from the program, may not only hinder the treatment of the juvenile's disorder, it also may affect the juvenile's body from the constant starting and stopping of the medication.

Another limitation in the study was the lack of time and funding. As stated earlier, the program was designed to last six months, where the juvenile gets treatment for six months. Following that six-month period, or if the juvenile turned 18 years of age while in the program, the youth was to be referred elsewhere for treatment. Many youth's families could not afford to seek treatment outside of the Court, and in many cases the juvenile's AD/HD treatment most likely ended. Thus, this short duration of time (especially for those who cannot be referred out to another program) may not be adequate enough to effectively treat the AD/HD symptoms, or even to develop a steady treatment plan. Treating AD/HD symptoms may take years, and six months may simply not suffice. This again may be a reason that school performance declined. Nevertheless,

due to the program being funded through a Title II Grant from the Department of Youth Services, treatment duration was limited, as was the funding for the program.

Because the program was funded through a grant, there was obviously a limit on the number of staff and students that could participate. For program staff, there was one psychiatrist, one case manager, and one staff member who administered the initial AD/HD screening evaluation. The lack of available staff was a hindrance on the number of students who could receive treatment in the program. For example, with only one psychiatrist, who was available just one day every other week, every juvenile who was eligible for the program was not able to participate. Increasing the number of program participants to the point that the psychiatrist is not able to effectively treat the juvenile will only hurt those in the program. Thus, keeping the number of participants to a limited number will help to deliver the best services to those who are in need of them most.

There was also a limitation due to the smaller sample size. With only 47 juveniles in the sample, it would be difficult to determine if the differences in the control and treatment groups were because of the differences in the actual juveniles, as opposed to differences due to the program. Finally, there was a limitation due to the lack of behavioral modification treatment in the program. Proper and effective treatment of AD/HD requires both medication and behavioral modification, and the lack of such a multi-modal treatment in the program may have decreased the effectiveness of the program (Arizona CASA Program, 2009).

Suggestions for Future Research

A program designed to treat AD/HD in order to lower juvenile delinquency should be more treatment-intensive, with the duration of the program lasting for at least one year. This would allow for a better evaluation of school performance. Six months, the duration of the program being evaluated, may not be enough time to adequately treat a juvenile for AD/HD. If the duration of treatment were extended, results may be seen that were not available with the shorter period of time, results that could permanently alter the view of AD/HD and juvenile delinquency.

One could also investigate the effectiveness of particular medications in lowering juvenile delinquency. For instance, the program psychiatrist prescribed a number of medications to treat the juveniles, consisting of medications like stimulants and selective serotonin reuptake inhibitors. It would be interesting to see if any certain medication is more effective in reducing the symptoms of AD/HD, and delinquent behavior. Medications affect individuals differently, but there may be a medication that works better for a certain type of individual (males versus females, teenagers versus adolescents, etc.).

Finally, future replication of this research should include more assessment of the juveniles. There were a number of data gathered throughout the program, including information on school performance and the presence and frequency of behavioral issues, but other types of information should be collected. This may include information from any counseling sessions attended by the juvenile and his/her family between 2005 and 2008, if available, or results from other examinations such as personality or intelligence

tests. Collecting more information on the juvenile will only help to effectively treat the juvenile for the disorder. This information should also be collected more regularly, especially when changing the prescribed medication. In order to effectively monitor the success of the juvenile through the program, program staff need to regularly collect and analyze data throughout the juvenile's participation.

Summary

Chapter five discussed the major findings of the research project, and also discussed the strengths and limitations of the research. The research hypothesis that treatment of AD/HD will lower juvenile delinquency, or the number of arrests experienced by the juveniles, was supported. The research questions proposed in the project were also discussed. This project can be used a starting point for other agencies to research the association between AD/HD and juvenile delinquency, and may even assist those agencies in the development of a similar program to lower the delinquency rate in those areas.

This program may not work in all areas or with all populations, but the results of the research project warrant further investigation. The problem of juvenile delinquency is of great importance and any method that may effectively reduce this problem should receive attention. It is with my dedication to the treatment of juveniles in need that I encourage the development of programs similar to the one evaluated in this research project, in the hope that one day there will be a solution to juvenile delinquency.

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ASEBA

Please print **CHILD BEHAVIOR CHECKLIST FOR AGES 6-18**

For office use only ID #

CHILD'S FULL NAME First Middle Last

CHILD'S GENDER ☐ Boy ☐ Girl

CHILD'S AGE

CHILD'S ETHNIC GROUP OR RACE

TODAY'S DATE Mo._____ Date _____ Yr. _____

CHILD'S BIRTHDATE Mo._____ Date _____ Yr. _____

GRADE IN SCHOOL _____

NOT ATTENDING SCHOOL ☐

Please fill out this form to reflect *your* view of the child's behavior even if other people might not agree. Feel free to print additional comments beside each item and in the space provided on page 2. ***Be sure to answer all items.***

PARENTS' USUAL TYPE OF WORK, even if not working now. *(Please be specific — for example, auto mechanic, high school teacher, homemaker, laborer, lathe operator, shoe salesman, army sergeant.)*

FATHER'S TYPE OF WORK _____

MOTHER'S TYPE OF WORK _____

THIS FORM FILLED OUT BY: (print your full name)

_____

Your gender: ☐ Male ☐ Female

Your relation to the child:

☐ Biological Parent ☐ Step Parent ☐ Grandparent

☐ Adoptive Parent ☐ Foster Parent ☐ Other (specify)_____

I. Please list the sports your child most likes to take part in. For example: swimming, baseball, skating, skate boarding, bike riding, fishing, etc.

☐ None

	Compared to others of the same age, about how much time does he/she spend in each?				Compared to others of the same age, how well does he/she do each one?			
	Less Than Average	Average	More Than Average	Don't Know	Below Average	Average	Above Average	Don't Know
a. _____	☐	☐	☐	☐	☐	☐	☐	☐
b. _____	☐	☐	☐	☐	☐	☐	☐	☐
c. _____	☐	☐	☐	☐	☐	☐	☐	☐

II. Please list your child's favorite hobbies, activities, and games, other than sports. For example: stamps, dolls, books, piano, crafts, cars, computers, singing, etc. (Do ***not*** include listening to radio or TV.)

☐ None

	Compared to others of the same age, about how much time does he/she spend in each?				Compared to others of the same age, how well does he/she do each one?			
	Less Than Average	Average	More Than Average	Don't Know	Below Average	Average	Above Average	Don't Know
a. _____	☐	☐	☐	☐	☐	☐	☐	☐
b. _____	☐	☐	☐	☐	☐	☐	☐	☐
c. _____	☐	☐	☐	☐	☐	☐	☐	☐

III. Please list any organizations, clubs, teams, or groups your child belongs to.

☐ None

	Compared to others of the same age, how active is he/she in each?			
	Less Active	Average	More Active	Don't Know
a. _____	☐	☐	☐	☐
b. _____	☐	☐	☐	☐
c. _____	☐	☐	☐	☐

IV. Please list any jobs or chores your child has. For example: paper route, babysitting, making bed, working in store, etc. (Include both paid and unpaid jobs and chores.)

☐ None

	Compared to others of the same age, how well does he/she carry them out?			
	Below Average	Average	Above Average	Don't Know
a. _____	☐	☐	☐	☐
b. _____	☐	☐	☐	☐
c. _____	☐	☐	☐	☐

Be sure you answered all items. Then see other side.

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Please print. Be sure to answer all items.

V. 1. About how many close friends does your child have? (Do *not* include brothers & sisters)

❒ None ❒ 1 ❒ 2 or 3 ❒ 4 or more

2. About how many times a week does your child do things with any friends outside of regular school hours? (Do *not* include brothers & sisters)

❒ Less than 1 ❒ 1 or 2 ❒ 3 or more

VI. Compared to others of his/her age, how well does your child:

	Worse	Average	Better	
a. Get along with his/her brothers & sisters?	❒	❒	❒	❒ Has no brothers or sisters
b. Get along with other kids?	❒	❒	❒	
c. Behave with his/her parents?	❒	❒	❒	
d. Play and work alone?	❒	❒	❒	

VII. 1. Performance in academic subjects. ❒ Does not attend school because _____

	Check a box for each subject that child takes	Failing	Below Average	Average	Above Average
Other academic subjects–for example: computer courses, foreign language, business. Do *not* include gym, shop, driver's ed., or other nonacademic subjects.	a. Reading, English, or Language Arts	❒	❒	❒	❒
	b. History or Social Studies	❒	❒	❒	❒
	c. Arithmetic or Math	❒	❒	❒	❒
	d. Science	❒	❒	❒	❒
	e. _____	❒	❒	❒	❒
	f. _____	❒	❒	❒	❒
	g. _____	❒	❒	❒	❒

2. Does your child receive special education or remedial services or attend a special class or special school?

❒ No ❒ Yes—kind of services, class, or school:

3. Has your child repeated any grades? ❒ No ❒ Yes—grades and reasons:

4. Has your child had any academic or other problems in school? ❒ No ❒ Yes—please describe:

When did these problems start?_____

Have these problems ended? ❒ No ❒ Yes–when?

Does your child have any illness or disability (either physical or mental)? ❒ No ❒ Yes—please describe:

What concerns you most about your child?

Please describe the best things about your child.

Be sure you answered all items.

Please print. Be sure to answer all items.

Below is a list of items that describe children and youths. For each item that describes your child ***now or within the past 6 months***, please circle the ***2*** if the item is ***very true or often true*** of your child. Circle the ***1*** if the item is ***somewhat or sometimes true*** of your child. If the item is ***not true*** of your child, circle the ***0***. Please answer all items as well as you can, even if some do not seem to apply to your child.

0 = Not True (as far as you know) **1 = Somewhat or Sometimes True** **2 = Very True or Often True**

0 1 2 1. Acts too young for his/her age
0 1 2 2. Drinks alcohol without parents' approval (describe):_____
0 1 2 3. Argues a lot
0 1 2 4. Fails to finish things he/she starts
0 1 2 5. There is very little he/she enjoys
0 1 2 6. Bowel movements outside toilet
0 1 2 7. Bragging, boasting
0 1 2 8. Can't concentrate, can't pay attention for long
0 1 2 9. Can't get his/her mind off certain thoughts; obsessions (describe): _____
0 1 2 10. Can't sit still, restless, or hyperactive
0 1 2 11. Clings to adults or too dependent
0 1 2 12. Complains of loneliness
0 1 2 13. Confused or seems to be in a fog
0 1 2 14. Cries a lot
0 1 2 15. Cruel to animals
0 1 2 16. Cruelty, bullying, or meanness to others
0 1 2 17. Daydreams or gets lost in his/her thoughts
0 1 2 18. Deliberately harms self or attempts suicide
0 1 2 19. Demands a lot of attention
0 1 2 20. Destroys his/her own things
0 1 2 21. Destroys things belonging to his/her family or others
0 1 2 22. Disobedient at home
0 1 2 23. Disobedient at school
0 1 2 24. Doesn't eat well
0 1 2 25. Doesn't get along with other kids
0 1 2 26. Doesn't seem to feel guilty after misbehaving
0 1 2 27. Easily jealous
0 1 2 28. Breaks rules at home, school, or elsewhere
0 1 2 29. Fears certain animals, situations, or places, other than school (describe): _____
0 1 2 30. Fears going to school
0 1 2 31. Fears he/she might think or do something bad
0 1 2 32. Feels he/she has to be perfect
0 1 2 33. Feels or complains that no one loves him/her
0 1 2 34. Feels others are out to get him/her
0 1 2 35. Feels worthless or inferior
0 1 2 36. Gets hurt a lot, accident-prone
0 1 2 37. Gets in many fights
0 1 2 38. Gets teased a lot
0 1 2 39. Hangs around with others who get in trouble
0 1 2 40. Hears sounds or voices that aren't there (describe): _____
0 1 2 41. Impulsive or acts without thinking
0 1 2 42. Would rather be alone than with others
0 1 2 43. Lying or cheating
0 1 2 44. Bites fingernails
0 1 2 45. Nervous, highstrung, or tense
0 1 2 46. Nervous movements or twitching (describe): _____
0 1 2 47. Nightmares
0 1 2 48. Not liked by other kids
0 1 2 49. Constipated, doesn't move bowels
0 1 2 50. Too fearful or anxious
0 1 2 51. Feels dizzy or lightheaded
0 1 2 52. Feels too guilty
0 1 2 53. Overeating
0 1 2 54. Overtired without good reason
0 1 2 55. Overweight
56. Physical problems ***without known medical cause:***
0 1 2 a. Aches or pains (***not*** stomach or headaches)
0 1 2 b. Headaches
0 1 2 c. Nausea, feels sick
0 1 2 d. Problems with eyes (***not*** if corrected by glasses) (describe): _____
0 1 2 e. Rashes or other skin problems
0 1 2 f. Stomachaches
0 1 2 g. Vomiting, throwing up
0 1 2 h. Other (describe): _____

 Be sure you answered all items. Then see other side.

Please print. Be sure to answer all items.

0 = Not True (as far as you know) **1 = Somewhat or Sometimes True** **2 = Very True or Often True**

0 1 2 57. Physically attacks people
0 1 2 58. Picks nose, skin, or other parts of body (describe): _____
_____
0 1 2 59. Plays with own sex parts in public
0 1 2 60. Plays with own sex parts too much
0 1 2 61. Poor school work
0 1 2 62. Poorly coordinated or clumsy
0 1 2 63. Prefers being with older kids
0 1 2 64. Prefers being with younger kids
0 1 2 65. Refuses to talk
0 1 2 66. Repeats certain acts over and over; compulsions (describe): _____
_____
0 1 2 67. Runs away from home
0 1 2 68. Screams a lot
0 1 2 69. Secretive, keeps things to self
0 1 2 70. Sees things that aren't there (describe): _____
_____
_____
0 1 2 71. Self-conscious or easily embarrassed
0 1 2 72. Sets fires
0 1 2 73. Sexual problems (describe): _____
_____
_____
0 1 2 74. Showing off or clowning
0 1 2 75. Too shy or timid
0 1 2 76. Sleeps less than most kids
0 1 2 77. Sleeps more than most kids during day and/or night (describe): _____
_____
0 1 2 78. Inattentive or easily distracted
0 1 2 79. Speech problem (describe): _____
_____
0 1 2 80. Stares blankly
0 1 2 81. Steals at home
0 1 2 82. Steals outside the home
0 1 2 83. Stores up too many things he/she doesn't need (describe): _____
_____
_____
0 1 2 84. Strange behavior (describe): _____
_____
0 1 2 85. Strange ideas (describe): _____
_____
0 1 2 86. Stubborn, sullen, or irritable
0 1 2 87. Sudden changes in mood or feelings
0 1 2 88. Sulks a lot
0 1 2 89. Suspicious
0 1 2 90. Swearing or obscene language
0 1 2 91. Talks about killing self
0 1 2 92. Talks or walks in sleep (describe): _____
_____
0 1 2 93. Talks too much
0 1 2 94. Teases a lot
0 1 2 95. Temper tantrums or hot temper
0 1 2 96. Thinks about sex too much
0 1 2 97. Threatens people
0 1 2 98. Thumb-sucking
0 1 2 99. Smokes, chews, or sniffs tobacco
0 1 2 100. Trouble sleeping (describe): _____
_____
0 1 2 101. Truancy, skips school
0 1 2 102. Underactive, slow moving, or lacks energy
0 1 2 103. Unhappy, sad, or depressed
0 1 2 104. Unusually loud
0 1 2 105. Uses drugs for nonmedical purposes (***don't*** include alcohol or tobacco) (describe): _____
_____
_____
0 1 2 106. Vandalism
0 1 2 107. Wets self during the day
0 1 2 108. Wets the bed
0 1 2 109. Whining
0 1 2 110. Wishes to be of opposite sex
0 1 2 111. Withdrawn, doesn't get involved with others
0 1 2 112. Worries
113. Please write in any problems your child has that were not listed above:
0 1 2 _____
0 1 2 _____
0 1 2 _____

Please be sure you answered all items.

TEACHER'S REPORT FORM FOR AGES 6-18

For office use only
ID #

Your answers will be used to compare the pupil with other pupils whose teachers have completed similar forms. The information from this form will also be used for comparison with other information about this pupil. Please answer as well as you can, even if you lack full information. Scores on individual items will be combined to identify general patterns of behavior. Feel free to print additional comments beside each item and in the spaces provided on page 2. ***Please print, and answer all items.***

PUPIL'S FULL NAME First Middle Last

PUPIL'S GENDER ❒ Boy ❒ Girl | PUPIL'S AGE | PUPIL'S ETHNIC GROUP OR RACE

TODAY'S DATE Mo._____ Date_____ Yr._____ | PUPIL'S BIRTHDATE (if known) Mo._____ Date_____ Yr._____

GRADE IN SCHOOL _____ | NAME AND ADDRESS OF SCHOOL _____

PARENTS' USUAL TYPE OF WORK, even if not working now *(Please be specific — for example, auto mechanic, high school teacher, homemaker, laborer, lathe operator, shoe salesman, army sergeant.)*

FATHER'S TYPE OF WORK _____

MOTHER'S TYPE OF WORK _____

THIS FORM FILLED OUT BY: *(print your full name)* _____

Your gender: ❒ Male ❒ Female

Your role at the school:

❒ Classroom Teacher ❒ Counselor
❒ Special Educator ❒ Administrator
❒ Teacher's Aide ❒ Other (specify):

I. For how many months have you known this pupil? _____ months

II. How well do you know him/her? 1. ❒ Not Well 2. ❒ Moderately Well 3. ❒ Very Well

III. How much time does he/she spend in your class or service per week?

IV. What kind of class or service is it? (Please be specific, e.g., regular 5th grade, 7th grade math, learning disability, counseling, etc.)

V. Has he/she ever been referred for special class placement, services, or tutoring?

❒ Don't Know 0. ❒ No 1. ❒ Yes — what kind and when?

VI. Has he/she repeated any grades? ❒ Don't Know 0. ❒ No 1. ❒ Yes — grades and reasons:

VII. Current academic performance — list academic subjects and check box that indicates pupil's performance for each subject:

Academic subject	1. Far below grade	2. Somewhat below grade	3. At grade level	4. Somewhat above grade	5. Far above grade
1. _____	❒	❒	❒	❒	❒
2. _____	❒	❒	❒	❒	❒
3. _____	❒	❒	❒	❒	❒
4. _____	❒	❒	❒	❒	❒
5. _____	❒	❒	❒	❒	❒
6. _____	❒	❒	❒	❒	❒

Be sure you answered all items. Then see other side.

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Please print. Be sure to answer all items.

VIII. Compared to typical pupils of the same age:	1. Much less	2. Somewhat less	3. Slightly less	4. About average	5. Slightly more	6. Somewhat more	7. Much more
1. How hard is he/she working?	❒	❒	❒	❒	❒	❒	❒
2. How appropriately is he/she behaving?	❒	❒	❒	❒	❒	❒	❒
3. How much is he/she learning?	❒	❒	❒	❒	❒	❒	❒
4. How happy is he/she?	❒	❒	❒	❒	❒	❒	❒

IX. Most recent achievement test scores (optional):

Name of test	Subject	Date	Percentile or grade level obtained

X. IQ, readiness, or aptitude tests (optional):

Name of test	Date	IQ or equivalent scores

Does this pupil have any illness or disability (either physical or mental)? ❒ No ❒ Yes— please describe:

What concerns you most about this pupil?

Please describe the best things about this pupil:

Please feel free to write any comments about this pupil's work, behavior, or potential, using extra pages if necessary.

Please print. Be sure to answer all items.

Below is a list of items that describe pupils. For each item that describes the pupil ***now or within the past 2 months,*** please circle the ***2*** if the item is ***very true or often true*** of the pupil. Circle the ***1*** if the item is ***somewhat or sometimes true*** of the pupil. If the item is ***not true*** of the pupil, circle the ***0***. Please answer all items as well as you can, even if some do not seem to apply to this pupil.

0 = Not True (as far as you know) 1 = Somewhat or Sometimes True 2 = Very True or Often True

0 1 2 1. Acts too young for his/her age
0 1 2 2. Hums or makes other odd noises in class
0 1 2 3. Argues a lot
0 1 2 4. Fails to finish things he/she starts
0 1 2 5. There is very little that he/she enjoys
0 1 2 6. Defiant, talks back to staff
0 1 2 7. Bragging, boasting
0 1 2 8. Can't concentrate, can't pay attention for long
0 1 2 9. Can't get his/her mind off certain thoughts; obsessions (describe): _____
_____
0 1 2 10. Can't sit still, restless, or hyperactive
0 1 2 11. Clings to adults or too dependent
0 1 2 12. Complains of loneliness
0 1 2 13. Confused or seems to be in a fog
0 1 2 14. Cries a lot
0 1 2 15. Fidgets
0 1 2 16. Cruelty, bullying, or meanness to others
0 1 2 17. Daydreams or gets lost in his/her thoughts
0 1 2 18. Deliberately harms self or attempts suicide
0 1 2 19. Demands a lot of attention
0 1 2 20. Destroys his/her own things
0 1 2 21. Destroys property belonging to others
0 1 2 22. Difficulty following directions
0 1 2 23. Disobedient at school
0 1 2 24. Disturbs other pupils
0 1 2 25. Doesn't get along with other pupils
0 1 2 26. Doesn't seem to feel guilty after misbehaving
0 1 2 27. Easily jealous
0 1 2 28. Breaks school rules
0 1 2 29. Fears certain animals, situations, or places other than school (describe):_____
_____
0 1 2 30. Fears going to school
0 1 2 31. Fears he/she might think or do something bad
0 1 2 32. Feels he/she has to be perfect
0 1 2 33. Feels or complains that no one loves him/her
0 1 2 34. Feels others are out to get him/her
0 1 2 35. Feels worthless or inferior
0 1 2 36. Gets hurt a lot, accident-prone
0 1 2 37. Gets in many fights
0 1 2 38. Gets teased a lot
0 1 2 39. Hangs around with others who get in trouble
0 1 2 40. Hears sounds or voices that aren't there (describe):_____
_____
0 1 2 41. Impulsive or acts without thinking
0 1 2 42. Would rather be alone than with others
0 1 2 43. Lying or cheating
0 1 2 44. Bites fingernails
0 1 2 45. Nervous, high-strung, or tense
0 1 2 46. Nervous movements or twitching (describe): _____
_____
0 1 2 47. Overconforms to rules
0 1 2 48. Not liked by other pupils
0 1 2 49. Has difficulty learning
0 1 2 50. Too fearful or anxious
0 1 2 51. Feels dizzy or lightheaded
0 1 2 52. Feels too guilty
0 1 2 53. Talks out of turn
0 1 2 54. Overtired without good reason
0 1 2 55. Overweight
56. Physical problems ***without known medical cause:***
0 1 2 a. Aches or pains (***not*** stomach or headaches)
0 1 2 b. Headaches
0 1 2 c. Nausea, feels sick
0 1 2 d. Eye problems (***not*** if corrected by glasses) (describe):_____
_____
0 1 2 e. Rashes or other skin problems
0 1 2 f. Stomachaches
0 1 2 g. Vomiting, throwing up
0 1 2 h. Other (describe):_____
_____
_____

 Be sure you answered all items. Then see other side.

Please print. Be sure to answer all items.

0 = Not True (as far as you know) 1 = Somewhat or Sometimes True 2 = Very True or Often True

0 1 2 57. Physically attacks people
0 1 2 58. Picks nose, skin, or other parts of body (describe):_____
_____
0 1 2 59. Sleeps in class
0 1 2 60. Apathetic or unmotivated
0 1 2 61. Poor school work
0 1 2 62. Poorly coordinated or clumsy
0 1 2 63. Prefers being with older children or youths
0 1 2 64. Prefers being with younger children
0 1 2 65. Refuses to talk
0 1 2 66. Repeats certain acts over and over; compulsions (describe): _____
_____
0 1 2 67. Disrupts class discipline
0 1 2 68. Screams a lot
0 1 2 69. Secretive, keeps things to self
0 1 2 70. Sees things that aren't there (describe):
_____
_____
0 1 2 71. Self-conscious or easily embarrassed
0 1 2 72. Messy work
0 1 2 73. Behaves irresponsibly (describe):_____
_____
_____
0 1 2 74. Showing off or clowning
0 1 2 75. Too shy or timid
0 1 2 76. Explosive and unpredictable behavior
0 1 2 77. Demands must be met immediately, easily frustrated
0 1 2 78. Inattentive or easily distracted
0 1 2 79. Speech problem (describe):_____
_____
0 1 2 80. Stares blankly
0 1 2 81. Feels hurt when criticized
0 1 2 82. Steals
0 1 2 83. Stores up too many things he/she doesn't need (describe):_____
_____
_____
0 1 2 84. Strange behavior (describe): _____
_____
0 1 2 85. Strange ideas (describe): _____
_____
0 1 2 86. Stubborn, sullen, or irritable
0 1 2 87. Sudden changes in mood or feelings
0 1 2 88. Sulks a lot
0 1 2 89. Suspicious
0 1 2 90. Swearing or obscene language
0 1 2 91. Talks about killing self
0 1 2 92. Underachieving, not working up to potential
0 1 2 93. Talks too much
0 1 2 94. Teases a lot
0 1 2 95. Temper tantrums or hot temper
0 1 2 96. Seems preoccupied with sex
0 1 2 97. Threatens people
0 1 2 98. Tardy to school or class
0 1 2 99. Smokes, chews, or sniffs tobacco
0 1 2 100. Fails to carry out assigned tasks
0 1 2 101. Truancy or unexplained absence
0 1 2 102. Underactive, slow moving, or lacks energy
0 1 2 103. Unhappy, sad, or depressed
0 1 2 104. Unusually loud
0 1 2 105. Uses alcohol or drugs for nonmedical purposes (***don't*** include tobacco) (describe):_____
_____
0 1 2 106. Overly anxious to please
0 1 2 107. Dislikes school
0 1 2 108. Is afraid of making mistakes
0 1 2 109. Whining
0 1 2 110. Unclean personal appearance
0 1 2 111. Withdrawn, doesn't get involved with others
0 1 2 112. Worries
113. Please write in any problems the pupil has that were not listed above.
0 1 2 _____
0 1 2 _____
0 1 2 _____

Please be sure you answered all items.

Youngstown
STATE UNIVERSITY

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July 14, 2009

Dr. Tammy King, Principal Investigator
Ms. Kelly Melvin, Co-investigator
Department of Criminal Justice and Forensic Sciences
UNIVERSITY

RE: HSRC Protocol Number: 07-2010
Title: Attention Deficit hyperactivity Disorder and Juvenile Delinquency: Will Treating the Effects of AD/HD Reduce Recidivism?

Dear Dr. King and Ms. Melvin:

The Human Subjects Research Committee has reviewed the abovementioned protocol and determined that it is exempt from full committee review based on a DHHS Category 4 exemption.

Any changes in your research activity should be promptly reported to the Human Subjects Research Committee and may not be initiated without HSRC approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the Human Subjects Research Committee.

The HSRC would like to extend its best wishes to you in the conduct of this study.

Sincerely,

Peter J. Kasvinsky
Dean, School of Graduate Studies
Research Compliance Officer

PJK/cc

c: Atty. Patricia Wagner, Chair
Department of Criminal Justice and Forensic Science