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Interpreting the Relation of Internal Behavior, External Behavior, Academic Behavior, and Social Behaviors in Students Diagnosed with Attention Deficit Hyperactivity Disorder.

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Interpreting the Relation of Internal Behavior, External Behavior, Academic Behavior, and Social Behaviors in Students Diagnosed with Attention Deficit Hyperactivity Disorder.

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Professionals who diagnose ADHD must follow the criteria set forth by the Diagnostic and Statistical Manual of Mental Disorders. They not only base their evaluation on characteristic behaviors, but also on a series of medical, behavioral, and educational assessments. The National Institute of Mental Health's (NIMH) *Multimodal Treatment Study of Children with and without Attention-Deficit/Hyperactivity Disorder* was a multisite study designed to evaluate the primary treatments for ADHD. The NIMH database is composed of a large number of assessments that were given to children/adolescents, parents, and teachers. The Conners, SNAP-IV, and Harter assessments were the only measures completed by all three groups. The purpose of this study was to determine if the responses to the three assessments from adolescents, parents, and teachers resulted in four behavioral constructs: Academic Behavior, External Behavior, Internal Behavior, and Social Behavior. The results of a factor analysis identified Social Behavior in all assessments, Academic Behavior in all assessments except for the Harter teacher assessment, Internal Behavior as evident only in the adolescent assessment for Conners and SNAP-IV, and External Behavior as evident in all parent assessments as well as the adolescent assessments for Conners and SNAP-IV. The assessments of adolescents had two similar constructs (Social and Academic Behavior); those completed by parents had three similar constructs (Academic, Social, and External Behavior); and those completed by teachers had two common constructs (Academic and External Behavior). A multitrait-multimethod matrix analysis showed a lack of convergent or

discriminant validity for the constructs across all assessments. Examination of the scores from the Conners and SNAP-IV adolescent assessments illustrated only moderate agreement in classifying adolescents as having ADHD and Hyperactivity. The results of the study provided another perspective in examining ADHD rating scales that may assist not only in improving psychological assessments but also in developing more accurate forms of diagnosis.

This dissertation by Shedeh Hajghassemali fulfills the dissertation requirement for the doctoral degree in Educational Psychology and Research approved by John Convey, Ph.D., as Director, and by Thomas Long, Ph.D., and Tracy Hunt-White, Ph.D. as Readers.

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CHAPTER 1

Introduction to the Problem

Schoolchildren are diagnosed with disabilities every day, and each year educators

must determine how they can best educate such children. According to *Individuals with*

Disabilities Education Improvement Act of 2004 (IDEA) and section 504 of the Rehabilitation Act

of 1973, school districts are to provide children who have been diagnosed with Attention

Deficit/Hyperactivity Disorder (ADHD) with a "free appropriate public education."

IDEA's conditions and criteria are more specific than Section 504, yet IDEA maintains that

each school district must offer a complete and specific evaluation for any child being

assessed for special education and/or related services (U.S. Department of Education, 2003).

Today, ADHD has become an acceptable and familiar term for educators and

parents to use when working with a child who exhibits excessively active behaviors.

According to the 2003 Centers for Disease Control and Prevention Report, approximately

1.6 million elementary school-aged children were diagnosed with ADHD.

Statement of the Problem

The process for ADHD assessment is complex. Aside from the children who

participate in the process, there are also teachers, physicians, school personnel other than

teachers, consultants, paid caregivers, parents or other relatives, and even neighbors who

participate either formally or informally (Sax and Kautz, 2003). According to IDEA and the

regulations, there are certain persons who are required to be part of the Individualized

Education Plan (IEP) team. A team will be organized to help follow a specialized program or

IEP to help the child get the best educational experience possible. Some of the participants include:

- A representative of the local education agency other than the child's teacher(s) who shall be qualified to provide, or supervise the provision of, specifically designed instructions to meet the unique needs of the child; this is typically the school principal. If this is the first time that the child has been evaluated, and if the representative is not an expert on evaluations, then one of the people who participated in the actual testing of the child must also be present.

- The teacher(s) of the child responsible for implementing the IEP.

- The parent or surrogate parent of the child.

- The child, when appropriate.

- The school must allow any other individual whom the parents or guardians wish to invite to attend. This may be a case worker involved with the family, someone involved with the day-to-day care of the child, or any person that can contribute vital information to the meeting. One may also choose to invite someone to assist in understanding the IEP or the IEP process, such as a lawyer experienced with educational advocacy, or a parent advocate. The school also has the right to invite other individuals who may contribute additional information about the child, such as a speech therapist (Federal Law, (Statute)602(19), (Reg.121a.344(a)).

Since there is not an exact formula or examination followed for the diagnosis of ADHD, most diagnoses are based on a variety of assessments and many of the instruments administered are completed by only one or two observers of the child. Some examples of these assessments are the Conners (Conners, 1973), Parent-completed Child Behavior Checklist (Achenbach and Edelbrock, 1973), and the Teacher Report Form of the Child Behavior Checklist (Achenbach, 1991).

The diagnosis process for ADHD is complex and includes various types of data: behavioral, medical, and educational. According to Sax and Kautz (2003), researchers—who surveyed Washington, DC area family physicians, pediatricians, and psychiatrists—found that teachers were most likely to first suggest ADHD. The table below displays Sax and Kautz's 2003 findings regarding the first people to suggest the possibility of ADHD.

**Table 1: Doctor's Estimates of Who First Suggests
the Diagnosis of ADHD (Sax and Kautz, 2003)**

Role	Group Percent (95% CI)
Teachers	46.4 (44.1-48.7)
Parents	30.2 (28.3-32.0)
Primary care physicians	11.3 (9.7-12.8)
Non-teacher school personnel	6.0 (4.9-7.2)
MD consultants	3.1 (2.3-3.9)
Paid caregivers	1.1 (.7-1.5)
Non-parent relatives	1.1 (.7-1.5)
Neighbors	.6 (.4-.8)
Other	.3 (.1-.5)

According to the Sax and Kautz research, after teachers, parents were the group most likely to first suggest ADHD. When these observations are noted, the teacher, parents, and the child typically complete various diagnostic instruments that facilitate the diagnosis of

ADHD. In some cases, the three parties complete very similar versions of one or more instruments, such as the Conners, whereas in other cases the instruments apply to a specific individual (such as ADD-H: Comprehensive Teacher Rating Scale) would only be completed by the teacher. Interestingly, little research has been done in terms of determining the degree to which the perspective of parents, teachers, and children converge. For instance, parents and teachers may be largely concerned with the external behaviors of the child, while the child is troubled with inner emotions, self-regulation, or even how he or she may socially assimilate with their peers.

Research that examines the roles of the adolescent, parent, and teacher is central because it will provide a more comprehensive view of adolescent behavior. Professionals will have a more informative diagnosis, and will also be able to develop more advanced assessments. Therefore the purpose of this study was to analyze the relationship of varying responses given by adolescent (A), parent (P), and teacher (T) in the Conners, Harter, and SNAP-IV assessments to determine if they could be classified into four behavioral constructs: academic (AB), external (EB), internal (IB), and social (SB). Furthermore, the study then examined whether the constructs can be reliably determined for A, P, and T, both conjointly and independently for each subgroup. Subsequently, a parallel set of correlation analyses was used to see whether the four possible constructs (AB, EB, IB, and SB) or similar constructs were related or independent.

The Symptoms and Possible Genesis of ADHD

According to National Institute of Mental Health (NIMH, 2001), both adults and children can be diagnosed with ADHD. This is one of the most common mental health

disorders in children. The classical symptoms of ADHD are impulsiveness, hyperactivity, and inattention according to the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorder* [DSM-IV-TR] (NIMH, 2001). The symptoms of ADHD should not be confused with typical negative behavior or an unexpected amount of energy exhibited by the average child. The DSM-IV-TR stipulates detailed criteria diagnosticians follow in order to make the diagnosis. The following are examples of the diagnostic criteria taken from the DSM-IV-TR. Some symptoms of ADHD behavior are the following:

- Fails to pay close attention to details or makes careless mistakes

- Has difficulty maintaining attention in task or play activities

- Does not listen when spoken to directly

- Has difficulty organizing tasks or activities

- Is easily distracted

- Is often forgetful

- Loses things necessary for tasks or activities

According to the DSM-IV-TR, a person must show signs of six out of the nine listed symptoms in order to be clinically diagnosed with ADHD, and these symptoms are to be classified with respect to the following features:

- Severity: the behavior must occur repetitively with this child compared to other children who are in his or her age range to a degree that is maladaptive and inconsistent with developmental level.

- Early Onset: some of the symptoms must be present before the age of seven.

- Duration: symptoms must persist for at least six months.

- Impact: there must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

- Settings: the symptoms must be present in two or more settings.

There are various explanations or causes for ADHD. According to Hinshaw (1994), ADHD is considered a genetic and neurological brain disorder, and the main cause of this brain disorder is a chemical imbalance affecting the neurotransmitters in the brain. Rosack (2004) believes that there are particular regions of the child's brain that are smaller and less active. Researchers have also observed that children with ADHD possess significant bilateral reductions in the size of dorsal prefrontal cortices, and bilateral reductions in the size of anterior temporal lobes (Rosack, 2004).

Dopamine has various functions in the brain, including regulation of motivation, reward, sleep, mood, attention, and learning; it also plays a role in behavior and cognition. The regions of the brain affected by ADHD are responsible for inhibition, sustained attention, and self-control. Barkley (1998) hypothesized that the dysfunction of the dorsal prefrontal cortex, whose activity is directed by dopamine, contributes to various behavioral characteristics seen in those afflicted with ADHD, such as impulsiveness, hyperactivity, inattentiveness, unpredictable behavior, and unrestrained behavior. Therefore, the

functioning of the dopamine-containing neurons is unbalanced in children who have ADHD. Sagvolden (2004) proposed that varying dopamine levels can also result in the erratic display of behavior.

Thus drugs that increase the dopaminergic transmission (such as Concerta, Adderall, and Stratera) in the brain should reduce some or all of the symptoms in a child with ADHD. Data indicate that negative behaviors are improved when a child with ADHD is placed on such drugs. Figure 1 is a diagram created by Dr. Russell Barkley in 1998, which illustrates the various affected brain structures, along with an example of various neurotransmitters.
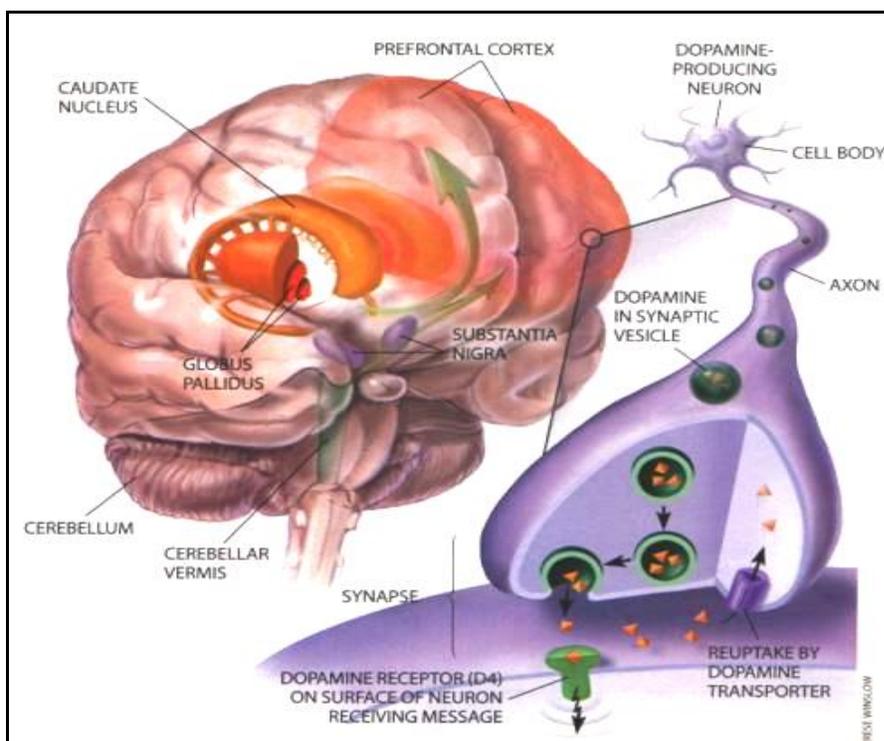

Figure 1: The right hemisphere of the human brain, along with the functioning of the neurotransmitters.

Researchers have established that ADHD symptoms are chemically based, and thus the negative and disruptive forms of conduct may be evidenced at any time of the day. The basic symptoms, such as impulsive behavior, do not change or get better when the child's environment changes; however, depending on the situation, the severity can change for the better or worse. For example, a child who has been diagnosed with ADHD may behave well when playing sports; however, his or her behavior may be exacerbated in an academic setting. This does not indicate that the child is selectively presenting symptoms of ADHD. Nonetheless, it does indicate that the child's behavior might be somewhat flexible as situations or locations change.

Corkum and Seigel (1993) believe that ADHD is 80% percent hereditary. Certain researchers have identified specific genes which can be linked to ADHD (Harris, 2004). However, there are instances where genetics may not play a role. For instance, possible reasons associated with the presence of ADHD include difficulties during pregnancy, pre-natal exposure to alcohol, tobacco, and drugs (such as cocaine), premature delivery, and low birth weight (Corkum and Seigel, 1993). High lead levels and injury during birth are additional reasons that a child may have developed ADHD (Selekman, 2002).

The National Institutes of Health Consensus Development Conference Statement (1998) discusses three types of ADHD covered in DSM-IV-TR:

- *Predominantly Inattentive Type*: distractible, but not hyperactive or impulsive.
- *Predominantly Hyperactive-Impulsive Type*: hyperactive and impulsive, but not very inattentive. This type is less common.
- *Combined Type*: distractible, hyperactive, and impulsive.

In most cases, a pediatrician diagnoses a child with ADHD but a neurologist, psychiatrist, or another physician or health professional may also play a role. It is important for a physician to rule out other possible reasons (e.g., learning disorders, conduct disorders, emotional disorders) that might account for the negative behavior exhibited by the child. A profile is created based on the child's family history and other possible causes of distress that could have prompted the negative behavior. The diagnostic process can take up to six months and usually requires the support and assistance of parents and school personnel. Table 2 illustrates the various specialties that are able to diagnose ADHD.

Table 2: Specialties that Diagnose ADHD

Specialty	Can diagnose ADHD	Can prescribe medication, if needed	Provides counseling or training
Psychiatrists	yes	yes	yes
Psychologists	yes	no*	yes
Pediatricians or family physicians	yes	yes	no
Neurologists	yes	yes	no
Clinical social workers	yes	no	yes

* As of October 2006, Louisiana and New Mexico laws and regulations allow psychologists who have completed specific training and meet other requirements to prescribe psychotropic medications. The other 48 states and the District of Columbia allow only physicians to prescribe medications.

Once a child has been diagnosed with ADHD, parents generally have three treatment options. Initially, some physicians or psychiatrists may choose to place the child

on stimulant medication. Common stimulant medications are Adderall, Dexedrine, Ritalin, and Concerta. Another option is behavior modification, which seems to have limited effects on a child who has ADHD (Brown, 2005). Many believe that the multimodal treatment, which is a combination of both medication and behavior modification, has the best results (Brown, 2005). The following section describes a national study that systematically explored these three treatment options. The NIMH MTA study is described in detail because the data provide the basis for this dissertation.

Background of the NIMH Study

NIMH conducted a study on children with ADHD which was published in August of 2005, entitled *Multimodal Treatment Study of Children With and Without Attention-Deficit/Hyperactivity Disorder,* (MTA). The study examined the safety and relative effectiveness of three treatments: medication management, behavior therapy, and multimodal intervention. The 14-month study compared these three treatment options to routine community comparison group (i.e., the control group). The central goals of that study were to look at three questions (NIMH, 2003):

- What was the relative efficacy of optimally managed medication treatment versus an intensive psychosocial treatment?
- What were the additive/synergistic effects of combined medication and psychosocial treatment compared to either treatment delivered alone?
- What was the relative efficacy of systematic, well-delivered treatments versus "community standards" treatments?

The NIMH MTA study followed 579 boys and girls between the ages of seven and nine who were randomly assigned to three treatment conditions: medication management only, behavioral treatment only, medication and behavioral treatment combined, and finally the control group, the community comparison group. This group allowed the family to be responsible for choosing a treatment after assessment and referral. The children were chosen from the New York State Psychiatric Institute at Columbia University (New York, NY), the Mount Sinai Medical Center (New York, NY), Duke University Medical Center (Durham, NC), the University of Pittsburgh Medical Center (Pittsburgh, PA), the Long Island Jewish Medical Center (New Hyde Park, NY), the Montreal Children's Hospital (Montreal, Canada).

After the 24-month period assessments, 290 children were added to the study. These children were known as the Local Normative Comparison Group (LNCG). This group came from a non-clinical sample. The NIMH researchers decided to create the LNCG in order to have a comparative group for long-term follow-up. Parents were notified of the NIMH MTA study through their local pediatricians, other health care providers, elementary school teachers, or radio/newspaper announcements. The parents contacted the investigators and eventually the children were interviewed and tested for ADHD, and some were then found eligible to participate in the study. Six sites were used, spread across five locations: New York, North Carolina, Pennsylvania, California, and Quebec.

The assessment of the study participants consisted of a one- or two-day appointment at the chosen clinic. Assessments consisted of interviews, rating scales, psychological and educational tests, and questions about the family. Parents/guardians also participated in assessment visits, and completed rating scales about the children and themselves. Interviews

of the child's teachers and people who knew the child well were completed with the informed consent of all parties; the parents were required to fill out a consent form. The data collected did not include any personal identifiers. For this reason, a distribution agreement was developed, and failure to comply with these rules could result in loss of future use of data.

The NIMH database was created from a large number of measures that were taken from the teacher, child, and parent during the MTA study. These measures included several popular assessment tools (e.g., Conners, Harter Self-perception, SNAP-IV, WISC-III, and Child School Information). Researchers also examined the academic measures, social measures, and demographic information for the participants by using various instruments, such as a parent/child questionnaire, teacher report form, and a structured clinical interview. From these instruments, a national database was created. The complete content of that database can be obtained in the NIMH MTA Study Dataset 0-24 (NIMH, 2006). There were many major findings at the 14-month endpoint of the study. According to NIMH (2001):

- Long-term multi-modal treatments, as well as medication management alone, were both significantly more effective at managing ADHD than intensive behavioral treatments and routine community treatments (NIMH, 2001). "Long-term" in this study was defined as the 14-month period during which the families were followed.

- The combined treatment approach had better results than routine community comparison group in other areas of functioning such as academic performance, anxiety symptoms, oppositional behavior, parent-child relations, and social skills.

Single treatments, medication-only, or behavioral treatment only were not as effective as the "combined" treatment. A valuable adjunct advantage for the combined treatment was that it allowed physicians to prescribe less medication than did the medication-alone treatment.

Pelham (2001) discussed more specific findings regarding the treatment groups:

- All four treatment groups showed dramatic improvement from their baseline behavior. Researchers looked at not only the teachers' ratings but also the parent's symptom ratings.

- The medication management treatment performed better than the behavioral treatment in terms of parent and teacher ratings of inattention and hyperactivity, but not on any of the other 16 measures, such as classroom observed behavior, or parent- and teacher-rated social skills.

- Combined treatment and medication management did not differ on any dependent measure.

- Combined treatment was better than behavioral treatment alone on parent and teacher ratings of inattention and parent ratings of hyperactivity-impulsivity, parent-rated oppositional behavior, and reading achievement.

- Medication management and combined treatments were generally superior to community treatments on parent and teacher ADHD symptom ratings and teacher-rated social skills, while behavioral treatments were generally equivalent to community treatments.

- Only combined treatment was superior to community treatments for parent ratings on oppositional and internalizing symptoms and for academic achievement.

- Only the two conditions with behavioral treatment were superior to community treatment on parent-child relationships.

- Parents preferred the two behavioral treatment groups to the medication management group.

- When order of means across different measures is examined, combined treatment ranks first considerably more often than other treatments.

In summary, the MTA study sets a significant standard for future testing and treatments for children with ADHD because of its size, scope, length, design, and the explicit use of preplanned evidence-based treatments and compliance across the various stages of the study sets.

Behavioral Categories

Since the publication of the initial NIMH study in 2005, other researchers have designed and carried out 40 studies looking at various relationships (medical, psychological, educational) within the studied groups. For instance, one study focused on biological and psychological relations between parents and children (NIMH, 2006). While examining the parent-child relationship is significant, it is also important to be aware of the wider spectrum of relationships between adolescent, parent, and teacher. The next section introduces and

defines four types of behavioral themes used by several of the measures used in the NIMH study.

The responses given by parents, teachers, and adolescents played a large role in the NIMH study; over 50 different assessments were given to one or more of the three participants. The various types of questions asked on the ADHD questionnaires can be classified into four main behavioral constructs: academic (AB), external (EB), internal (IB), and social (SB). Each of these categories is described below. These four behavioral themes, crossed with the three types of participants, form the foundation for this proposed study.

The four specific categories hypothesized in this study examine certain characteristics and behaviors that a child may exhibit. There is no consensus regarding the definition of behavioral difficulties, and it is particularly difficult to define emotional and behavioral disorders (Hallahan and Kauffman, 2003). Hallahan and Kauffman believe that it is similar to describing a customary event such as anger, loneliness, or happiness. We each have our own idea of what these experiences and behaviors are, but forming precise definitions is difficult.

Hallahan and Kauffman (2003) believe that there are many issues that contribute to the obstacle of developing a definition for attention and behavioral difficulties. These include:

- The absence of exact and agreed upon criteria for normal behavior
- Difficulties in measuring behavior (including attention and emotions)
- The complex relationships between emotional attention and behavior

- Professional disagreement or differences among the individuals who work with children and adolescents exhibiting these difficulties

Therefore, all definitions must be developed in order to aid in the process of clarifying the language being evaluated and used throughout this study.

Internalizing and Externalizing Behavior

Internal or 'internalizing' behavior (IB) consists of symptoms such as withdrawal, depression, anxiety, and obsessions/compulsions. IB can be viewed as thoughts, feelings, and cognitive-linguistic workings that translate into outer, observable behaviors or external behaviors (Mackesey, 2005). Some examples of internalizing behavior are anxiety, withdrawal, and depression. It is common to see these behaviors in children who are emotional, shy, or even have somatic complaints (Hill et al., 1998). IB seems to be identified less often, as the manner of conduct is internal to the person and thus not outwardly expressed. This form of behavior is usually self-imposed. Examples include evading peers, low or restricted activity levels, or being timid, shy, and withdrawn. At times, these children are easily overlooked because they tend to blend in or become unnoticed (Hinshaw et al., 1992).

External or 'externalizing' behavior (EB) consists of symptoms such as aggressiveness, acting-out, and noncompliance (Hallahan & Kauffman, 2003). EB can be explained as behavior shown when a child reacts to internal stimuli, or an "internal state" (Mackesey, 2005). Some examples of EB are body language, motor movements, avoidance, stuttering, and disruptions in fluency. EB can occur in any situation or circumstance,

especially when the child is interacting with another peer and/or with an adult. Some researchers believe that EB is "too much behavior" or an "excess amount of behavior." Children are more likely to avoid a child who displays unconstructive behavior. Some examples of extreme EB are hitting, screaming, kicking, destroying property, name calling, and bullying (Slentz & Krogh, 2001). Most children with ADHD are identified through EB, though it is common to see children exhibit behavioral characteristics of both dimensions when being diagnosed with ADHD.

<center>Academic Behavior and Social Behavior</center>

Academic behavior (AB) can be defined as a periodic assessment to determine if learning is occurring. AB refers to the actions or reactions of a child in relation to the educational environment. The behaviors can be conscious or unconscious, overt or covert, and voluntary or involuntary. A few examples of AB are not completing homework, poor performance on tests, and poor class attendance (Jensen, 1986). AB can be measured by collecting various forms of data on student performance, such as actual classroom tasks and assignments. According to Pinrich and De Groot (1990), there are three general categories of academic tasks: (a) in-class seatwork and homework, (b) quizzes and tests, and (c) essays and reports.

Social behavior (SB) is behavior that occurs in a common setting and results from the relations between and among people. SB takes place in a social context and results from interaction among individuals (Farabee, 2000). Some examples of SB for ADHD children are helping, aggression, or the development of romantic relationships (Malle, 1999). All of these behaviors play a significant role in diagnosing children with ADHD. For example, a

perceiving, thinking, ethical, deliberate, and well-behaved person considers the deliberate or sensible meaning of the other person; SB involves expectations about the actions of other people. What distinguishes social from non-social behavior is whether or not a child is capable of comprehending his or her own actions and taking responsibility for his or her behavior, actions, or practices (Rummel, 1975). The following section further describes how these four behavioral dimensions will be operationalized, tested for reliability, and then combined across the roles of adolescent, parent, and teacher.

Purpose and Approach of the Current Study

This study examined data found in the Conners, Harter, and SNAP-IV assessments obtained from the NIMH MTA study. These assessments were found in the NIMH MTA instruction manual. It is important to note that these were the only assessments used, and were given to exactly three participants: adolescent, parent, and teacher.

The purpose of this study was to analyze the relationship of varying responses given by adolescent (A), parent (P), and teacher (T) in the Conners, Harter, and SNAP-IV assessments to determine if they could be classified into four behavioral constructs: academic (AB), external (EB), internal (IB), and social (SB). Furthermore, the study then examined whether the constructs can be reliably determined for P, T, and A both conjointly and independently for each subgroup. Subsequently, a parallel set of correlation analyses was used to see whether the four possible constructs (AB, EB, IB, and SB) or similar constructs were related or independent.

One of the forms of assessment is the Conners, which consists of the Conners Parent Rating Scale (CPRS), Conners Teacher Rating Scale (CTRS), and the Conners

Adolescent Self Report (CASR). The Conners is not only an ADHD assessment, but also evaluates difficult or troubling behavior in children and adolescents across a variety of mental health categories (Conners, 2007).

The second assessment is Harter's, which entails the Harter – Adolescent Version (HARTERA), Harter – Parent Version (HARTERP), and the Harter – Teacher Version (HARTERT). The Harter is an assessment which evaluates the child's perceived competence in various areas such as academics and sports as well as their perceived self-reliance (Granleese, 1994). The final form of assessment is the Swanson, Nolan, and Pelham Questionnaire (SNAP-IV), which is a temperament and character inventory (Murray, 2005). There are also three forms of the SNAP-IV, SNAP-IV – Parent Version (SNAPPAR), SNAP-IV – Teacher version (SNAPTEA), and the SNAP-IV – Adolescent Version (SNAPADOL).

Research Questions

The various types of questions asked on the ADHD questionnaires will be classified into four main constructs: AB, EB, IB, and SB. The study will attempt to determine whether the constructs can be reliably determined for P, T, and A both conjointly and independently for each subgroup. Subsequently, a parallel set of correlation analyses will be used to see whether these four possible constructs are related or independent. These analyses will look at each subgroup separately, and as a whole sample comprised of P, T, and A. Therefore the following research questions will be addressed.

- Can the constructs of AB, EB, IB, and SB be verified using the subsets of items from the Conners, Harter, and SNAP-IV?

- Do constructs of AB, EB, IB, and SB exist for P, T, and A? Can these structures be confirmed for each group?

- When observing all the constructs and assessments in a correlation:

  a. Do P, T, and A share any associations or variables?

  b. As a group, do these constructs share any associations or variables?

Significance of the Study

This study will help not only specialists, but also families and other individuals who interact with children who have ADHD. Many of the P, T, and A assessments are used in correlation with another, but it has not been shown if they support one another. The benefits of the study include a clear and objective description of the relationship between the constructs and assessments used in the NIMH MTA study, and as a result will improve the researchers' understanding of these psychological assessments. Therefore, the results from this study can support upcoming developments and enhancements of psychological assessments used in conjunction with each other and therefore improve the diagnosis of children with behavioral disorders.

CHAPTER 2

Literature Review

Attention Deficit Hyperactivity Disorder (ADHD) is a prevalent topic for many educators and parents. As a result, many issues have developed regarding ADHD, particularly regarding diagnosis. ADHD is a complex subject matter and there are numerous debates about diagnostic methods and treatment options.

ADHD is defined as a neurological condition that consists of inattention and hyperactivity-impulsivity (U.S. Department of Education, 2003). ADHD is not a disorder of attention, but is rather a developmental issue that affects the section of the brain that controls restraint and self-consciousness. Children who have ADHD also exhibit excessive motor activity and disobedient behavior, yet their personality characteristics and individual strengths are varied, and their intelligence usually falls within the norm.

Categories of ADHD

The behavior that children with ADHD demonstrate falls into two categories: poor sustained attention and hyperactivity-impulsiveness. From this, three subtypes of ADHD have been developed according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR): predominantly inattentive, predominately hyperactive-impulsive, and combined types. Children with poor sustained attention usually have difficulty in school regarding tasks such as following directions, staying focused, and keeping up with their materials. Children diagnosed with ADHD are also more likely to make thoughtless mistakes and regress or refuse to complete tasks which may require concentration. However, children

with hyperactivity-impulsiveness are more likely to appear fidgety, have difficulty taking turns, or find it unable to remain still for an extended periods of time. They may also have trouble playing quietly, and parents and teachers state that children who are diagnosed with hyperactivity-impulsiveness seem to be "driven by a motor."

Not only are the academic lives of children affected, but their social lives are affected as well. Not all children with ADHD are aggressive and mischievous; children with ADHD can also be withdrawn and have very poor self-esteem. However, these noticeable and often uncommon behaviors are more likely to lead to social isolation.

DSM-IV-TR Criteria

The DSM-IV-TR offers specified diagnostic criteria for each mental disorder as guidelines for making diagnoses, and "provides clear descriptions of diagnostic categories in order to enable clinicians and investigators to diagnose, communicate about, study, and treat people with various mental disorders" (DSM-IV-TR, p. xxxvii). According to the DSM-IV-TR, there are three types of ADHD:

- *Predominately Inattentive Type*: distractible, but not hyperactive or impulsive.

- *Predominately Hyperactive-Impulsive Type*: hyperactive and impulsive, but not very inattentive. This type is less common.

- *Combined Type*: distractible, hyperactive, and impulsive; this is the most common type.

DSM-IV-TR Criteria for ADHD include:

I. Either A or B:

A. Six or more of the following symptoms of inattention have been present for at least six months to an extent that is disruptive and inappropriate for developmental level:

1. Often does not give close attention to details or makes careless mistakes in schoolwork, work, or other activities.

2. Often has trouble keeping attention on tasks or play activities.

3. Often does not seem to listen when spoken to directly.

4. Often does not follow instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions).

5. Often has trouble organizing activity.

6. Often avoids, dislikes, or doesn't want to do things that take a lot of mental effort for a long period of time (such as schoolwork or homework).

7. Often loses things needed for tasks and activities (such as toys, school assignments, pencils, books, or tools).

8. Is often easily distracted.

9. Is often forgetful in daily activities.

B. Six or more of the following symptoms of hyperactivity-impulsivity have been present for at least six months to an extent that is disruptive and inappropriate for developmental level:

1. Often fidgets with hands or feet or squirms in seat.

2. Often gets up from seat when remaining in seat is expected.

3. Often runs about or climbs when and where it is not appropriate (adolescents or

    adults may feel very restless).

4. Often has trouble playing or enjoying leisure activities quietly.

5. Is often "on the go" or often acts as if "driven by a motor."

6. Often talks excessively.

7. Often blurts out answers before questions have been finished.

8. Often has trouble waiting one's turn.

9. Often interrupts or intrudes on others (for example, butting into conversations or

    games).

II.   Some symptoms that cause impairment were present before age seven.

III. Some impairment from the symptoms is present in two or more settings (for

      example, at school/work and at home).

IV.   There must be clear evidence of significant impairment in social, school, or work

      functioning.

V.   The symptoms do not happen only during the course of a Pervasive Developmental

      Disorder, Schizophrenia, or other Psychotic Disorder. The symptoms are not better

      accounted for by another mental disorder (such as Mood Disorder, Anxiety

      Disorder, Dissociative Disorder, or a Personality Disorder).

Based on these criteria, three types of ADHD are identified:

1. ADHD, *Combined Type*: if both criteria 1A and 1B are met for the past six months.

2. ADHD, *Predominantly Inattentive Type*: if criterion 1A is met but criterion 1B is not

   met for the past six months.

3. ADHD, *Predominantly Hyperactive-Impulsive Type*: if Criterion 1B is met but Criterion

   1A is not met for the past six months.

Causes and Identification of Children with ADHD

The behaviors exhibited by individuals with ADHD consist of impaired beginning

and stopping of responses and incomplete responses; impaired achievement, retrieval, and

relearning of programs for sequential motor tasks; and poor speaking skills and knowledge

(Goldman et al., 1998). As a result, children with ADHD have difficulty processing the

significance of consequences, and require immediate satisfaction. If a child exhibits

inappropriate behavior, negative consequences should have some bearing on the behavior;

however, when a child with ADHD is given a consequence the behavior exhibited would

not improve, and at times it could deteriorate. According to Goldman, Genel, Benzman, and

Slanetz (1998), it is common to see a constant ongoing battle between authority figure and

child.

Although there is a great deal of neuroscientific data, it is uncommon for physicians

to use psychological assessments when diagnosing ADHD. The use of imaging such as

functional magnetic resonance imaging (fMRI) or positron emission tomography (PET)

scans are also used to study ADHD but can be very costly. Some professionals utilize MRIs,

which scan the sub-cortical structures (cortex, striatum, palladium, and thalamus) in order to

study the differences between ADHD and control populations in the rate of development of these areas. Neuronal loops connecting these structures have distinct tasks. The prefrontal loop involves future behavior, short-term memory, and directing attention; the limbic loop deals with reinforcement extinction; and the motor loop handles response coordination and non-declarative habit learning (Sagvolden, 2004).

With ADHD, researchers have found that the structures of the brain's right hemisphere are affected more than the left hemisphere, and the cerebellum is decreased in size. Children with ADHD usually have a smaller total cerebral and frontal lobe volume, and the various regions of the basal ganglia (caudate nucleus) are underdeveloped. In addition, there is a reduction in the area of the anterior or posterior corpus callosum and dysfunctions of the prefrontal-sub cortical system (Tannock et al., 1998). Therefore, environmental factors alone may not explain the development of ADHD.

Treatment Options for ADHD

Currently there is not a cure for ADHD, yet there are a number of treatment options available. These options consist of behavioral, pharmacological, and multi-modal treatments. Their effectiveness can be seen by using a trial-by-error method. Each child responds to each treatment in a unique way. The American Academy of Pediatrics believes that primary care clinicians should establish a treatment program that recognizes ADHD as a chronic condition. Also, everyone who interacts with the child must be informed of the specific goals and prescribed medications. After a certain amount of time has elapsed, a re-evaluation must take place to see if there has been progress—this includes a follow-up with all those involved in the child's life (APA, 2001). Since ADHD has a combination of effective

treatments, some professionals prescribe medication, and others believe that behavior modification is a better solution. The most accepted form of treatment has been a combination approach.

If one opts or chooses to place one's child on medication, there are a multitude of choices. Examples include Ritalin, Ritalin Slow Release, Dexedrine, Adderall, and Concerta (time-released). Studies of ADHD-related medication have been short-term, and researchers are not sure of the long-term outcome. It is common for physicians to have difficulties determining an effective medication type or dosage for their patients. This is why many physicians believe they should keep a close eye on the child to observe side effects that may occur while taking the medication. If adverse side effects occur, then dosages will be adjusted or another type of medication will be used until a positive result is observed (NIMH, 2001).

Another option for children who have ADHD is behavior modification. The positive side of this form of treatment is that it can be used with or without medication. Behavior modification is based on the principals of operant conditioning, developed by B. F. Skinner. This form of treatment replaces undesirable behaviors with more desirable ones through positive or negative reinforcement (Martin, 1995). One behavior modification technique that is widely used is positive reinforcement, which encourages certain behaviors using a reward system. In behavior therapy, it is common for the therapist to draw up a contract with the client establishing the terms of the reward system. Charts and schedules will help everyone document their progress, and also allow the child to visualize his or her behavior. A related behavior modification technique is negative reinforcement, an event or behavior whose reinforcing properties are associated with its removal. Skinner's example

consisted of terminating an existing electric shock after a rat presses a bar as negative

reinforcement (Martin, 1995).

In addition to rewarding desirable behavior, behavior modification can also

discourage unwanted behavior through punishment, which is the application of an aversive

or unpleasant stimulus in reaction to a particular behavior (Martin, 1995). An example of

behavior modification for children could be the removal of privileges such as television or

video games when they disobey their parents or teacher. The removal of reinforcement

altogether is called extinction, which eliminates the incentive for unwanted behavior by

withholding the expected response (Martin, 1995). An example of removal reinforcement is

"time-out," where a child is separated from the main group when he or she is displaying

inappropriate behavior. This technique removes the expected reward of attention, and

isolates the child for a certain period of time depending upon their age.

As a rule, the environment that surrounds the student must be structured and organized. In

order to achieve positive results, the discipline must be consistent and correspond with the

behavior that is observed (APA, 2001). Therefore, there must be clear and concise rules and

consequences (Goldman et al., 1998).

ADHD is one of the most common chronic psychological diagnoses for children

and approximately 60-80% (3-7% of children) of those diagnosed continued to experience

symptoms in adolescence (Mayes et al., 2000). Since many of the symptoms of ADHD can

affect the various areas of a child's everyday performance, the treatment must be directed in

the same way. Over-diagnosis of ADHD is a significant issue for parents and physicians.

The number of boys versus the number of girls diagnosed with ADHD is disproportionate;

boys are three times more likely than girls to be given a diagnosis of ADHD, and also twice

as likely to be diagnosed with ADHD along with a learning disability (Wender, 1999). Also,

boys with ADHD are likely to be diagnosed with other psychological disorders, such as

conduct problems, Tourette's syndrome, and drug addiction (Mayes et al., 2000). Females are

more likely to have symptoms such as mood swings, while boys are more likely to externalize

their emotions and become aggressive and anti-social.

<div align="center">Identifying and Making a Diagnosis</div>

Since ADHD characteristics are commonly seen in a child's normal behavior, one

must look at the key behaviors and their duration for a complete diagnosis. According to the

DSM-IV-TR, a person must exhibit several characteristics to be clinically diagnosed with

ADHD (U.S. Department of Education, 2003):

- Severity: the behavior in question must occur more frequently in the child than in other children at the same age.

- Early onset: at least some of the symptoms must have been present prior to age seven.

- Duration: the symptoms must also have been present for at least six months prior to the evaluation.

- Impact: the symptoms must also have been present on the child's academic or social life.

- Setting: the symptoms must be present in multiple settings.

Although it is not easy to be diagnosed with ADHD, there are still concerns regarding the over-diagnosis of ADHD in children of elementary school age. Professionals such as psychiatrists, pediatricians, neurologists, and clinical social workers should participate in the process of diagnosing children. In addition, there must be behavioral, medical, and educational data-gathering (U.S. Department of Education, 2003). Professionals must exclude other possible reasons for the observed behavior, and then proceed with psychological testing. As a result, gathering the necessary information from a variety of sources is the key to a thorough diagnosis. This process may take up to six months and requires the support and assistance of the school and parents.

A significant component of diagnosis consists in assessments and/or questionnaires, some of which might include: vision, hearing, and speech tests, a medical examination that includes a neurological evaluation, a developmental history that evaluates a child's motor skills, a review of cognitive abilities and social behavior, and a thorough family history of psychiatric, medical, learning, or developmental problems. Since the ADHD behaviors are overstated, many learning or physical disabilities can become disguised. It is essential to have comprehensive interviews with parents, teachers, and children in order to assess academic performance and behavior patterns. Report cards or achievement test scores can also be valuable tools as pieces of the diagnostic puzzle are put together. Intelligence testing and standardized behavioral rating scales such as the Conners, Stanford-Binet, and WISC-IV are common measurements. There are also ADHD-specific assessments which assist in the diagnosis of ADHD, such as the Conners Rating Scale Revised, ADHD-SC4, and BASC for ADHD (Mueller et al., 1999). Although the evaluation is completed by a psychologist, the assessments are completed by a teacher, doctor, family member, and anyone else that spends

a great amount of time with the child. Once these evaluations are completed, the data-

collector (e.g., a psychologist) will review the family history along with the assessment results

and determine a diagnosis. The last step entails a collective discussion of current strategies to

address problems (Silver, 1992).

Co-morbidity

Children who have ADHD are also more likely to have learning disabilities or other

behavioral disorders. According to NIMH (1999), almost one-third of all children with

ADHD have some type of learning disability in math, reading, or written communications.

Research shows that 40-60% of children with ADHD have at least one co-existing disability.

Some of these disorders may include disruptive behavior disorder, mood disorders, anxiety

disorders, and Tourette's syndrome. It is also common to confuse ADHD with other

common disorders in children. There are many co-morbid psychological disorders that co-

exist with ADHD; some examples are oppositional defiant disorder (ODD), conduct

disorder (CD), anxiety, depression, mood disorder, tic disorders, and learning disabilities. All

of these disorders may have some of the same characteristics of ADHD; however, the

intensity of the characteristics is what differs.

ODD can be described as "a pattern of negative, hostile, and defiant behavior.

Common symptoms include frequent loss of temper, arguing (especially with adults), and

refusal to obey rules, intentionally annoying others, and blaming others" (Fowler, 2002).

However, unlike children who have ADHD, children who have ODD a display intentionally

malicious, angry, and quick-tempered behavior. CD may also have some of the same

attributes, the child may become aggressive towards people and animals, destroying

property, stealing, or frequently breaking the law. At times it seems as if he or she does not have a conscience, acting purely egotistically.

Another co-morbid aspect for children with ADHD is anxiety and depression. Children diagnosed with ADHD at times realize that they are different from other children, and thus become self-conscious and evidence low self-esteem. Not only do these children seem to worry constantly, but they also have difficulty controlling their emotions. It is also common for children who have been diagnosed with ADHD to be irritable, moody, and have trouble concentrating and relaxing. Children who have also been diagnosed with depression may share the symptoms of both ADHD and depression; for example, the child may have difficulty sleeping, concentrating, and he or she may feel rejected by others. There are various forms of depression, but the most common one that usually exists along with ADHD is dysthymia. This is a very extreme form of depression that lasts for days at a time and may affect the daily routines of the person.

Severe mood swings or an abnormally high or low mood can be seen as a mood disorder (DSM-IV-TR, 2005), and may involve hallucinations or delusions. The most common forms of mood disorders are major depression, cyclothymia (a mild form of bipolar disorder), SAD (seasonal affective disorder), and mania (euphoric, hyperactive, over-inflated ego, unrealistic optimism). According to the DSM-IV-TR (2005), children who exhibit sudden or rapid movements of the body are commonly diagnosed with tic disorder. Vocal tics are also common and focused on involuntary throat clearing or sounds. The most common form for children is called transient tic disorder, which affects up to 10 percent of children. This certain behaviors are uncontrollable and usually become worse when a child is under stress or becomes nervous. Finally, the most common disorder that is found among

children diagnosed with ADHD is a learning disability in an activity such as reading, writing, speaking, or mathematics. Fowler (2002) states that between 10-90% of children who have been diagnosed with ADHD also have some type of learning disability.

Some negative aspects of the recommended assessments include the fact that they are time-consuming and costly. Yet assessments do help to exclude and/or identify other possible conditions that may be causing the negative behaviors, and physicians can request specific assessments based on the issues observed during the initial evaluation. Full psychological IQ or achievement testing is not required for all children, though it is beneficial for an accurate diagnosis. In addition, brain scans or electroencephalograms (EEGs) can record the brain's activity and help pinpoint the precise diagnosis in some patients (Barkley et al., 1992). It is common for practitioners to also ask questions such as (Silver, 1992):

- What problems, if any, occurred during pregnancy?

- Did the mother or baby contract any infections?

- What about medication use?

- Could alcohol or other drug consumption be an issue?

- Were there any complications during labor and delivery?

- Is there a history of significant head trauma, infections of the central nervous system, seizures, or other neurological disorders?

- Is the child experiencing stress?

- Are there peer, sibling and/or family problems?

- Is the child able to play independently or with others?

The figure below describes the overlapping of co-occurring disorders in the multimodal treatment of ADHD prior to the randomization to the four treatment groups. Therefore all subjects met the requirements for combined-type ADHD (Jensen, 2001).
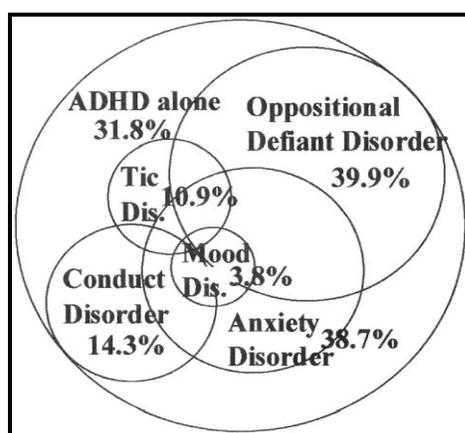
Figure 2: ADHD and Other Disorders

Components of a Comprehensive Evaluation

A comprehensive diagnosis of ADHD includes three forms of evaluation: behavioral, educational, and medical. The initial phase begins with an assessment of the child's medical history, along with their academic record. The physician must interview parents, teachers, and health care professionals to gain a full understanding of the child's specific behavior. He or she attempts to get a full picture of the situation by evaluating when the disruptive behaviors started and how long they have persisted. This far-ranging assessment is meant to determine if the child displays the relevant behaviors in numerous

settings. Once the general information has been collected, an accurate behavioral evaluation and diagnosis can begin.

Behavioral Evaluation

There are specific questionnaires that diagnose and/or evaluate children with ADHD (U.S. Department of Education, 2003). The American Academy of Pediatrics (AAP) states that one should not use a wide range of rating scales or teacher questionnaires when diagnosing children with ADHD. They emphasize the importance of abiding by the ADHD-specific rating scales such as Conners Rating Scales for Parents and teachers and Barkley's School Situations Questionnaire (AAP, 2000). In addition to ADHD assessments, many professionals believe that broadband scales should be used to screen for other coexisting conditions. An example of a broadband scale is the Achenback Child Behavior Checklist, which helps to detect emotional problems such as anxiety and depression, but also examines the possibility of ADHD (Dendy, 2006).

Dendy (2006) also states that the results of behavioral evaluations are not completely reliable insofar as the parent or teacher filling out the assessment may have a bias that leads to an exaggeration of the child's behavior. For example, a parent or teacher might have trouble on the job, therefore becoming impatient and markedly less tolerant of a child's negative behavior. This is why many professionals ask for a multitude of tests from various people who interact with the child. Dendy also states the results from the assessments should be used as indicators of issues that might exist, and not as a valid diagnosis in and of themselves.

Educational Evaluation

The educational evaluation is more complex. It involves not only input from teachers and school personnel, but also direct observations of the child in the classroom. This information, along with the academic history, can give a complete picture of the child's behavior. Classroom observations allow the diagnostician to see how severe the behavior is on a daily basis. Classroom observation is also beneficial because a child can be observed as he or she interacts with peers. This information should be collected during different occasions for periods of approximately 20-30 minutes. Some of the behaviors that one may observe are (U.S. Department of Education, 2003):

- Problems of inattention, such as becoming easily distracted, making careless mistakes, or failing to finish assignments on time.

- Problems of hyperactivity, such as fidgeting, getting out of an assigned seat, running around the classroom excessively or striking out at a peer.

- Problems of impulsivity, such as blurting out answers to the teacher's questions or interrupting the teacher or other students in the class.

- More challenging behaviors, such as severe aggressive or disruptive behavior.

Once a child is diagnosed with ADHD, he or she may be eligible to receive special education and related services under Part B of IDEA. However, a child must be evaluated to determine if he or she has a disorder or if he or she needs special education and related services because of the disability. The educational evaluation also includes an assessment of the child's performance in school. It is important to note the amount of work completed as

well as how well it was completed. The next step is to also give various forms of educational

assessments that help to investigate possible reasons for the child's disruptive behavior other

than ADHD.

Once the assessments and observation are complete, a group of qualified

professionals and the parents of the child get together to review and discuss the information.

They will decide whether the child has a disability and is in need of special education

services. An Individualized Education Plan (IEP) will be developed and a team will be

organized to help follow a specialized program to help the child get the best educational

experience possible. If for some reason the child does not meet the requirements necessary

under IDEA, they may qualify for evaluation under Section 504 of the Rehabilitation Act,

which guarantees rights to individuals with certain responsibilities.

Medical Evaluation

A medical evaluation is not required under Part B of IDEA for a diagnosis of

ADHD. Therefore schools can only request evaluations if it is conducted at no cost to the

parent. A medical assessment or evaluation examines whether the child is manifesting

symptoms of ADHD, based on the following three objectives:

- To assess problems of inattention, impulsivity, and hyperactivity that the child is
  currently experiencing.
- To assess the severity of these problems.
- To gather information about other disabilities that may be contributing to the
  child's ADHD symptoms.

The American Academy of Pediatrics has published clinical guidelines that provide

recommendations for the assessment and diagnosis of ADHD. This was developed by

pediatricians and experts in the fields of neurology, psychology, child psychiatry, child

development, education, epidemiology, and pediatrics. It is intended to be used primarily by

primary care physicians who are involved in the diagnosis of children with ADHD (U.S.

Department of Education, 2003):

- Medical evaluation for ADHD initiated by the primary care clinician.

- Questioning parents regarding school and behavioral issues, either directly or

  through a pre-visit questionnaire, may help alert physicians to possible ADHD.

- In diagnosing ADHD, physicians should use DSM-IV-TR criteria.

- The assessment of ADHD should include information obtained directly from

  parents or caregivers, as well as a classroom teacher or other school professional

  regarding the core symptoms and degree of functional impairment.

- Evaluation of a child with ADHD should also include assessment of co-existing

  conditions such as learning and language problems, aggression, disruptive

  behavior, depression, or anxiety.

<div align="center">Education</div>

Children with ADHD are protected under two important federal mandates: the

Individuals with Disabilities Education Act (IDEA) and Section 504 of the Rehabilitation

Action of 1973. The specific regulations can be found in 34 CFR sections 300 and 104.

Children with ADHD may not necessarily be eligible for services under IDEA, but may fall

under Section 504.

According to the IDEA, children with disabilities are entitled to a free and

appropriate public education by authorizing special education and other related services for

students who meet the necessary qualifications. However, in order to meet these

requirements, the education of the student must be negatively affected. They must also be

diagnosed with at least one of the 13 specific categories of disabilities, and thus need special

education and related services (U.S. Department of Education, 2003). A group of

professionals and the child's parents decide whether the child is eligible for disability under

IDEA; some categories may include specific learning disability or emotional disturbance.

However, a medical diagnosis of ADHD is not enough to receive special education services

(Code of Federal Education, 2001).

As a result, Section 504 was created to help ensure a free appropriate education for

all children who have physical or mental impairments which significantly limit one or more

primary daily activities. This means that their disability requires special education-related

services or supplementary aids and services (U.S. Department of Education, 2003). IDEA

and Section 504 require schools to provide special education. The schools also have the

option to make essential modifications or adaptations for students whose ADHD negatively

affects their educational performance. Under current legislation, ADHD is covered under

the "Other Health Impaired" category.

Many educators forget that not all children behave in the same manner, nor do they

develop at the same speed emotionally, physically, or personally. "We cannot reach and teach

a child if we do not understand him" (Boyles, 1977). One must recognize the significant

concerns of the child and his or her parents, and gain knowledge about the difference between psychological disorders and merely defiant or boisterous behavior. Therefore, teachers must learn to distinguish between not only psychological disorders and simple conduct problems, but also cultural differences. These psychological disorders display distinctive behavior that may start or be apparent as early as pre-school.

Unfortunately, children who are diagnosed with ADHD are "labeled" for their entire educational career. Researchers believe labeling will help educators identify children who need more attention during their academic career. As a result, educators will be able to learn from these students, which will lead to more research and public attention to the problem at hand (Cornett-Ruiz & Hendricks, 1993). However, most researchers and professionals believe that more stereotypes are created when labeling or diagnosing a child, and this will then lead to a negative impact on the child's education and future (Cornett-Ruiz et al., 1993)

Another issue is the lack of education that regular education teachers have regarding special education. It is common to see children judged on their actions, rather than attempting to investigate the root of the problem. The diagnosis of ADHD has an intense effect on a child's self-esteem and academic education (Brown, 2000). It even affects the relationship that ADHD children have with other peers, especially if they are separated and taught in a special education classroom.

Multimodal Treatment Study of Children with ADHD

The Multimodal Treatment Study of Children with Attention-Deficit/Hyperactivity Disorder (MTA) was sponsored by NIMH and the U.S. Department of Education's Office of Special Education Programs (OSEP). This study was the first cooperative child treatment

study conducted by NIMH; it was also one of the largest and longest-running clinical trials to date (Arnold et al., 1997).

The NIMH MTA study was pioneered because of various unanswered questions regarding ADHD. The previous single-site studies could not answer the public health questions regarding the treatment of ADHD and there was a need for a more extensive multi-site study. In September 1992, a Request for Application (RFA) was published and grants were awarded to six sites. Their goal was to conduct a multi-site study on the treatment of ADHD for children. NIMH and the OSEP established a two-wave, three-cohort strategy. Due to funding constraints, they staggered the peak treatment years. The three initial wave sites recruit two subject cohorts—each in the second and third years—and then the second-wave sites enroll two cohorts each in the third and fourth years.

During the first year of the project, developing the program and schedule were of central importance. The principal committee consisted of Principal Investigators and a Co-Investigator for each site, NIMH and OSEP collaborators, a Chair of subcommittees, a statistical consultant, and other co-investigators. Their goal involved translating major public health goals into an overall project, organizing goals and priorities, developing a plan for cross-site consistency, and attempting to reach an agreement regarding other unresolved issues (Arnold et al., 1997). Initially there were 16 major issues that were discussed in the RFA; however, the final protocol only fully addressed six out of the 16, two of these being moderately addressed. Some of the most important RFA questions dealt with (Arnold et al., 1997):

- The relative effectiveness of medications and psychosocial treatments.

- Long-term effects.

- The advantage of intense systematic treatment over routine community comparison treatment.

- Moderating effects on treatment response by patient characteristics such as co-morbidity, SES, and sex.

The committee believed that two major issues must be addressed: (1) the advantages of medication vs. psychosocial treatment vs. combined treatment over time (long-term) and (2) the advantage of systematic state-of-the-art treatment relative to a comparison group receiving community standard treatment (Arnold et al., 1997). Participation was contingent upon specific criteria listed below in Table 3.

Table 3: Subject Inclusion Criteria (NIMH, 1994)

Gender Both males and females were admitted into the study. There were a relatively small number of females, and thus there had to be an adaptive randomization to ensure that an equal number of females were assigned to each treatment group.
Age The child must be aged seven to nine.
Grade in school The child must be in first to fourth grade.
Diagnosis The child must meet the DSM-IV criteria from ADHD Combined Subtype, via DISC.
Family Members The child must live with the primary caretaker (parent). He or she must have known the child for at least six months, and must be able to sign the consent form.
Informed Consent and Compliance The families and child must agree, in writing, to "full participation" in the study.
Rating Scale Scores Both the Conners Parent Rating Scale Hyperactivity Index or Factor *and* the Conners Teacher Rating Scale must be 1.0 standard deviation higher than the norm and either index or factor 1.5 standard deviation above the national norm of age and sex.

Treatment Groups

Children were referred to the MTA study by mental health clinics, primary care physicians, teachers, or schools. Each child was randomly assigned to a treatment group, and the groups were balanced on gender. The data were collected over a one- or two-day scheduled time at the clinic. The families and patients were to be treated for 14 months, and assessed and questioned after a 24-month period. The randomization was performed after the assessment because it would help to guarantee the manner in which the baseline assessments would be gathered exclusive of the treatment assignments. The children were randomly assigned to four treatment conditions: Medication Management only, Behavioral Treatment only, Combined Medication and Behavioral treatment, or Community

Comparison condition. This latter option consisted of reassessment and referral, with the family finding routine community treatment of their own choosing (NIMH, 2002). The treatment conditions explanations are listed in Table 4, below.

Table 4: MTA Study Treatment Conditions (NIMH, 2002)

	Medication Management Strategy (MedMgt)	Behavioral Treatment Strategy (Beh)	Combined Strategy (Comb)	Community Comparison Group (CC)
Active Treatment	1-month blind titration with methylphenidate for best dose; if unsatisfactory, open titration with d-amphetamine, pemoline, TCA. When effective drug regimen is found, maintain with monthly visits; adjust dose as indicated by monthly monitors and by algorithm.	Intense, multi-component, including 27 group and 8 individual sessions (interspersed with the groups) of parent training, structured 16–20-session teacher/consultation, 8-wk full-time Summer Treatment Program, and 12 wk of half-time paraprofessional aide (PPA), all integrated in complementary fashion, with phone calls between visits.	Integration of all treatment components in first 2 conditions (except bibliotherapy), with **(a)** more extensive data base available from behavioral therapist to assist medication adjustment decisions and **(b)** information from pharmacotherapist to assist in decisions about escalation of behavioral interventions.	*None by MTA Staff.* Assessed-only at same time points as active treatment groups. Families obtain treatment of own choosing in the community. If already has a treatment provider, referred back for treatment; if not, given list of referral agencies, including community MH Center, which can help find community treatment.
Supplementary Treatment	Supplementary general advice and bibliotherapy without systematic behavioral intervention.	Supplementary general advice; no medication.	Supplementary general advice; no bibliotherapy.	None.
Case Manager	Pharmacotherapist is case manager.	Therapist/consultant (TC).	Therapist/consultant, with weekly advice from combined-treatment clinical team.	None.
Emergency Services	ASAP[b] emergency services as needed.	ASAP[b] emergency services as needed.	ASAP[b] emergency services as needed.	None.

MTA, Multimodal Treatment of Attention-Deficit Hyperactivity Disorder.
[a]Subjects in all 4 arms received comprehensive assessments at baseline, 3 months, 9 months, and 14 months.
[b]ASAP, Adjunct Services and Attrition Prevention. Each treated subject has a bank of eight "ASAP sessions" that can be used in emergencies, monitored by a cross-site clinical panel.

Design

Six separate sites were chosen to participate in this project and each site had a total of 96 students (out of 576 total children). There were four treatment conditions and each group was assessed periodically for two years. The three groups were given a specific treatment over a 14-month period. They were divided using three forms of treatment: (1) medication only, (2) combined treatment, and (3) psychosocial treatment. The fourth group was able to continue the treatment of their choice, also called routine community comparison group.

The benefits of this design were numerous, and there were long-term outcome comparisons among various areas of the design. An initial area under discussion was a state-of-the-art behavioral treatment, as well as the combination of both medical and behavioral treatment. The research groups were also able to focus on the comparison of intense treatment versus routine treatment. Finally, the researchers were able to do a battery of assessments at specific periods. This enabled the researchers to gather data needed to look at other subsidiary analyses regarding severity, sex, SES, co-morbidity, ethnicity, parental psychopathology, and domain of dysfunction on outcome, palatability, and compliance, and allow examination of predictor, mediator, and moderator variables (Arnold et al., 1997). This data could then be used to further examine related issues that may be directly associated with the diagnosis and treatment of ADHD.

Medication Alone

Medication plays a large role in ADHD treatment. Between 2-2.5% of elementary-age school children in the United States (approximately 600,000 students) receive some form

of medication for ADHD (Richters et al., 2008). There have been well-documented short-term benefits for these medications. Richters et al. discuss two main problems that stem from the use of medication: the degree of normalization produced by stimulants and the lack of consistent behavior in various settings. In this situation, normalization means the process whereby behaviors are made to seem "normal" through a specific means (such as medication). Although children who participated in the NIMH MTA study had positive results on medication when in a regulated setting, such as a school or hospital setting, they did not produce the same results at home. In addition, children's academic levels did not significantly improve. Although children who receive medication may have improved behavior, they still had difficulty in academic achievement (Arnold et al., 1997). The issue of dosage and adjustment created dilemmas for all the participants and researchers. The committee decided upon a specific order of drugs after studying the responses to: methylphenidate, dextroamphetamine, pemoline, imipramine, and other drugs (nortriptyline, bupropion, clonidine) which were chosen by a cross-site pharmacology panel (Arnold et al., 1997).

Psychosocial/Behavioral Treatment

The decision to use psychosocial treatment was the issue of each treatment modality (Arnold et al., 1997). There are many advantages and disadvantages to including a psychosocial-treatment- alone condition in the MTA study. The advantages include (Arnold et al., 1997):

- Addresses major relative value debate between pharmacological and behavioral treatments.

- Most logical and scientifically rigorous approach.

- Great clinical and public policy relevance, given resistance to pharmacological approach in some quarters.

- Checks for sleeper effects.

- Meets an ethical need to clarify data based on the opinion that it is unethical to medicate.

- Answers to additional questions: psychosocial treatment and medication, and medication versus psychosocial treatment.

- Unique opportunity; if not done in this study, will probably never be done.

The disadvantages include (Arnold et al., 1997):

- Cost for sufficient stand-alone power of psychosocial treatment.

- Large dedication of time and effort by parents and teachers.

- May eliminate excellent drug responders from sample.

- Ethical question in withholding or withdrawing effective short-term pharmacotherapy.

- Danger of contamination by self-medicators or those who eventually require medication.

There were various forms of treatment that the principal committee had to consider: the direct treatment of the child, parent training in home behavioral management, and school-based intervention, all of which were specifically requested by the RFA. The committee had to follow guiding principles in their choice of treatments: "(a) treatments had to be state-of-the-art, with research evidence of at least short-term efficacy, (b) treatments had to have specific instructions and be transportable, (c) each unimodal treatment had to be intense, integrated, and flexible enough to convincingly stand on its own, and (d) the distinctions between modalities had to be drawn sharply enough to support contrasts and comparisons required by the initial questions" (Arnold et al., 1997). The committee decided on three separate forms of treatment: parent training, summer treatment program (STP), and school-based treatment.

This form of treatment had to address many different areas of function, and also had to center on important elements in the child's adjustment. As a result, the researchers decided not only to consider school-based intervention, but also home behavioral management. The parent training involved 27 group sessions and eight individual sessions per family. Their focus was to teach parents a specific training regimen consisting of various behavioral strategies. This also enabled them to continue the at-home behavioral management routine that was occurring in school, which helped the children to stay on a consistent behavior management schedule.

The child-focused treatment was conducted in a summer treatment program that children attended five days per week for eight weeks. This program also consisted of intensive behavioral interventions that were managed by counselors/aides (equivalent to the parent program). These therapists guiding the parent training also supervised the

counselors/aides. Social skills training and specialized academic instruction were provided, along with the use of rewards. The basic model that was used in this program was based on allowing the child to earn various rewards based on their ability to abide by well-defined rules and meet specific behavioral expectations.

The school-based treatment had two parts: (1) 10 to 16 sessions of biweekly teacher consultation concentrated on classroom behavior management strategies, and (2) 12 weeks of a part-time paraprofessional aide who worked directly with the child in the classroom. During the school year, a Daily Report Card was used to link the child's behavior at school to the behaviors exhibited at home. The Daily Report Card consisted of one-page teacher-completed ratings of the child's success on certain behaviors. Each day the child would bring home the card so that the parents could review the information and award rewards for a successful day. This behavioral management strategy was slowly reduced over a 14-month period. As a result, the process had been taken down to once monthly or stopped altogether by the end of the period.

Combined Treatment

The final treatment consisted of combining both treatments (medication and psychosocial treatment) in order to meet both the clinical and scientific goals of the study. As a result, many patients who were given this type of therapy were given a decreased amount of stimulant relative to a child who is on medication alone. Those supervising the child's behavioral and medical treatments met on a regular basis in order to be able to control the overall treatment. Researchers had to resolve various problems, such as how to regulate the amount of medication and psychosocial treatment, and when to start the

medication or the psychosocial treatment. They also had to work with the logistical constraints of timelines that the researchers had to follow. In return, the project researchers decided to start both the medication and behavioral therapy at the same time; this would allow for both treatments to be used for an equal duration, and also allowed for the parents and/or caretakers to have some immediate relief while the psychosocial treatment started (Arnold et al., 1997).

<div align="center">Community Comparison Group</div>

The community comparison group did not receive treatment within the study protocol. The students were reassessed intermittently throughout the MTA study. Subjects who were originally referred to the study by a provider/practitioner that treats ADHD were sent back to the provider with permission from the family. If the student was not referred by a provider, then the family would be given a list of regional and local child mental health agencies and primary care physicians. The study staff could not recommend them to a treatment resource. The families in this group were given the written summary report from the baseline evaluation, and the treatment provider could also ask for a list of all baseline measure scores from the study team. In addition, the community comparison physician only met with the children face-to-face one or two times per year, and for shorter periods of time each visit. The physicians prescribed lower doses and twice-daily stimulant medication. There also were no interactions between the teachers and physicians. However, the community comparison group had a temporary case manager meet with the school to explain the group assignment.

Purpose of this Study

The NIMH MTA study is one of the most informative studies on children and ADHD. Understanding the different components of ADHD and the diagnosing methods is challenging. There are numerous forms of assessment, and there is not yet a single agreed-upon mode of confirmed diagnosis. There are a variety of assessments that test for ADHD, but when completing the various assessments, there was not a manner in which the tests could be correlated with one another.

The purpose of this study was to analyze the relationship of varying responses given by parent (P), teacher (T), and adolescent (A) in the Conners, Harter, and SNAP-IV assessments to determine if they could be classified into four behavioral constructs: academic (AB), external (EB), internal (IB), and social (SB). Furthermore, the study then examined whether the constructs can be reliably determined for P, T, and A both conjointly and independently for each subgroup. Subsequently, a parallel set of correlation analyses was used to see whether the four possible constructs (AB, EB, IB, and SB) or similar constructs were related or independent.

The assessments evaluate information given to the examiner, which is why the formal name of psychological testing is "psychological assessment." This information is given either in the form of answers to interview questions or as answers on paper (or a computer) to specific questions. Ultimately, a test's accuracy depends on how carefully and seriously one answers the questions. The overall problem with psychological tests concerns their ability to measure what they are supposed to measure. The accuracy, or usefulness, of a test is known as its validity. There are three forms of validity in regards to psychological tests.

- *Construct Validity* refers to the ability of a test to measure the psychological construct, such as depression, that it was designed to measure. One way this can be assessed is through the test's convergent or discriminant validity, which refers to whether a test can give results similar to other tests of the same construct and different from tests of different constructs.

- *Content Validity* refers to the ability of a test to sample adequately the broad range of elements that compose a particular construct.

- *Criterion-related Validity* refers to the ability of a test to predict someone's performance on some task.

The ability of a test to give consistent results is known as its reliability. For example, a mathematics test that asks a student to solve problems of progressive difficulty is very reliable; if a person could not solve a calculus problem today, he or she would not be able to solve it tomorrow. However, a personality test asks ambiguous questions, which a person answers according to random daily emotions and hence may change answers depending on the context. Internal Consistency Reliability refers to how well the test items relate to each other. Test-retest Reliability refers to how well results from one administration of the test relate to results from another administration of the same test at a later time.

Statement of the Problem

There has not yet been a study that has looked at the relationship of varying responses given to the adolescent, parent, and teacher ADHD assessments. Since there was

not an exact or factual form of diagnosis for ADHD, all diagnoses were based on various assessments, yet many of the tests were only given to one or two of the participants. In this study, the data set from the assessments given in the NIMH study were analyzed to determine whether the three stakeholders have similar or different perspectives on behaviors associated with ADHD. Specifically, this study focused on behaviors that were classified into four constructs: academic, external, internal, and social.

CHAPTER 3

Methodology

Understanding the different components of ADHD and the diagnosing methods is a

challenging process. Currently, there are numerous forms of assessments without a single

agreed-upon mode of confirmed diagnosis. Therefore, it is important to collect information

not only from the child, but also from other individuals who interact with him or her. In the

MTA study, the researchers at NIMH were able to collect behavior and background

information regarding the child from sources such as parents and teachers. This chapter will

explain the methodology that was used in investigating the relationship of similar assessment

questions answered by adolescent, parent, and teacher during the MTA study. It will examine

participants, research design, and instrumentation; indicate how the data were analyzed; and

study the conclusions drawn from this data.

The MTA Study

The MTA Clinical Trial, described above, began in 1992. Over 50 different forms of

assessments were given to the MTA participants. However, there were only three common

assessments given to the complete group of interest: teacher, child, and parent. The

assessments included the Conners Rating Scale, Harter's Self-perception Scale, and the

Swanson, Nolan, and Pelham Questionnaire (SNAP-IV).

A secondary analysis was conducted on the existing database, and only a selected

number were able to be evaluated in this study. An assessment point of 36 was used since

this was a common point for all the assessments, and only those Subject Identification

numbers (IDs) that were present in all nine of the assessments were used in the analysis. The

total number of IDs in each dataset was 582. Since each assessment had its own data set, a

total of nine datasets (three individual assessments and groups) were created to begin the

analysis.

The Conners, Harter, and SNAP-IV instruments were included in the NIMH MTA

instruction manual (see Appendix A). This study examined the correlation among the

subscales, and examined the three assessments to see if the questions could be classified into

four main behavioral constructs: academic (AB), external (EB), internal (IB), and social (SB).

Using SPSS, a factor analysis was used to identify the constructs that were present within the

assessments. Next, a Cronbach's alpha was used to examine the reliability of the

assessments. Finally, a modification of the multitrait-multimethod matrix (MTMM)

examined the relationship among the three assessments (Conners, Harter, and SNAP-IV),

and their subscales when completed by the adolescent, parent, and teacher.

The results of the factor analysis organized the questions on each of the ADHD

assessments and classify each item into subscales also known as constructs. From this

analysis, the subscales are labeled by examining the specific questions that were grouped

together. The study examined if certain constructs could be reliably determined for parent

(P), teacher (T), and adolescent (A) both conjointly and independently for each subgroup.

Subsequently, a parallel set of correlation analyses was used to see whether these constructs

or similar constructs are related or independent. This chapter will help explain the process by

which the data were analyzed to answer the following questions:

I. Could the constructs of AB, EB, IB, and SB be empirically verified using item subsets from Conners, Harter, and SNAP-IV?

II. Did constructs of AB, EB, IB, and SB exist for P, T, and A? Can these structures be confirmed for each group?

III. When observing all the constructs and assessments in a correlation:

a. Did P, T, and A share any associations or variables?

b. As a group, did these constructs share any associations or variables?

Assessments

Classroom-based behavior modification, social skills, cognitive training, and parent training/home-based interventions are various examples of psychosocial interventions. In order to diagnose a child with ADHD and develop a behavioral modification plan for the student, one must evaluate the child with an appropriate form of assessment. Conners, Harter's, and SNAP-IV are three forms of assessments that focus on identifying ADHD behaviors. Each of these tests has separate versions for P, T, and A. This is notable because the professional who diagnoses the child is thus given a complete or triangulated picture of the child's behavior.

The original data included on the NIMH CD was created in SAS. When transferring the original data into SPSS, the data did not result in a sting format with the ID as the key variable, causing the results to be repetitive and blurred. The SAS data had to be rearranged and transferred into SPSS using only the ID as the key variable. Once this was completed it could be transferred into SPSS, making an accurate analysis possible.

The initial organization of the study relied upon creating a data set that was controlled by the ID, each of which not only had an adolescent response but a separate response for the teacher and parent within each assessment. After evaluating all the assessments, it was determined that the CASR would be the basis of the IDs that would be used in this study. Using the specific ID helped to develop a core group of subjects that would be evaluated when examining all of the assessments. The adolescent version of all the assessments were used since some did not have a child version. The Conners rating scales for P, T, and A were used as a basis upon which to organize the additional assessments. An assessment point of 36 was used since this was a common point for all the assessments, and only the IDs that were present in all nine of the assessments were used in the analysis. The total number of IDs in each dataset was 582. Since each assessment had its own data set, a total of nine datasets (three individual assessments and groups) were created to begin the analysis. Codes were used in place of the questions and answers to the assessments throughout the data collection process by NIMH. The next step consisted of labeling all of the variables using the instruments and variable definitions found on the CD under database documentation. NIMH provided copies of all the assessments used in the MTA study, along with the codes that corresponded to the individual variable labels. This process allowed decisions of labeling to be based on the language and phrases used in each question, and also help get a better picture of the responses. Once the labeling was completed, the principal factor analysis could begin for all of the datasets.

Conners Rating Scale

The Conners Rating Scale (CRS-R) has three versions: adolescent, parent, and teacher. CRS-R instruments are used via self-report, routine screenings in schools, mental health clinics, residential treatment centers, pediatric offices, juvenile detention facilities, child protective agencies, and outpatient settings. The test can help measure hyperactivity as well as provide a clear viewpoint of the adolescent's behavior from the parent, teacher, and others who have daily interaction with the child. It also determines a pre-measured starting point prior to therapy and can also help to monitor the treatment outcome. Finally, the CRS-R helps to provide valid and reliable information to support diagnoses and treatment decisions when all forms of the tests are combined (Pearson, 2007).

A large standardized database helps support the assessment's reliability and validity. The database was based on a sample of more than eight thousand children and adolescents. It consisted of males and females aged 3 to 17, and minority group samples were also well represented. There are also multi-dimensional scales to help decipher the intensity of ADHD as well as co-morbid disorders. Some of the various disorders and conditions the CRS-R can help to identify are (Pearson, 2007):

- Oppositional Defiant Disorder

- Cognitive Problems/Inattention

- Hyperactivity

- Anxious-Shy

- Perfectionism

- Social Problems

- Psychosomatic

- Conners Global Index

- *DSM-IV* Symptom Subscales

- ADHD Index

The CRS-R comes in long and short formats, and can be used in a variety of behavioral situations and/or environments. An easy-to-interpret graphical display of the results helps to explain the outcome to children, parents, teachers, or other relevant parties. When discussing the reliability of the assessment, the coefficient alphas for internal consistency reliability were highly acceptable for the normative groups. The CRS-R was also precise in measuring the constructs that they had intended to measure. For the long form of the CRS-R, there was a range from .728 to .942; for the short form, .857 to .938. When examining the validity, the CRS-R has been compared to the Conners Depression Inventory, Conners Rating Scale, and the Conners Continuous Performance Test overall index. In addition, correlations were also done between the adolescent, parent, and teacher rating, which revealed that the CRS-R does identify childhood and adolescent ADHD behavioral problems and psychopathology. It has been noted that the validity studies are continuing (Conners, 1997).

The CASR assessment had seven subscales: Family Problems, Emotional Problems, Conduct Problems/Inattention, Cognitive Problems/Inattention, Anger Control Problems, Hyperactivity, and ADHD Index. The CPRS consisted of ten subscales: Conduct Problems, Anxious-Shy, Restless-Disorganized, Learning Problems, Psychosomatic, Obsessive-Compulsive, Antisocial, Hyperactive-Immature, Hyperactivity Index, and CPRS total score.

Finally, the CTRS entailed eight subscales: Hyperactivity, Conduct Problem, Emotional

Overindulgent, Anxious-Passive, Antisocial, Daydream-Attention Problem, Hyperactivity,

IOWA Inattentive/Overactivity, and CTRS total score (Conners, 1997).

<div align="center">Swanson, Nolan, and Pelham Questionnaire</div>

The Swanson, Nolan, and Pelham Questionnaire (SNAP-IV) is a common form of

assessment when diagnosing ADHD. The SNAP-IV Rating Scale is a questionnaire for

adolescents, teachers, and parents. It evaluates items from the DSM-IV criteria for ADHD

and includes two subsets of symptoms: inattention and hyperactivity/impulsivity. The

parent/teacher form of the assessment consists of an 18-item norm-referenced checklist that

is designed to determine if symptoms of ADHD are present (Swanson et al., 1983).

The items from the DSM-IV criteria for ADHD and Oppositional Defiant Disorder

are included as well as additional items from other DSM-IV disorders such as Conduct

Disorder, Intermittent Explosive Disorder, Tourette's Disorder, Stereotypic Movement

Disorder, Obsessive-Compulsive Disorder, Generalized Anxiety Disorder, Narcolepsy,

Manic Episode, Major Depressive Episode, Dysthymic Disorder, etc. (Jensen, 2006). In

addition to the DSM-IV items for ADHD and ODD, the SNAP-IV contains items from the

Conners Index Questionnaire (Conners, 1968) and the Iowa Tests of Basic Skills (ITBS).

The items questions that were used from the Conners Index were items #4, #8, #11, #21,

#32, #33, #36, #37, #38, and #39 (See Appendix A). The SNAP-IV uses a 0 to 3 rating

scale: Not at All = 0, Just a Little = 1, Quite a Bit = 2 and Very Much = 3.

Psychometric evaluation and validation has been conducted for the SNAP-IV and is

considered strong. This assessment shows relatively high test/retest reliability but very low

inter-rater reliability. The concern here is that there may be a natural bias on the part of the subject who is completing the forms. However, the ability of the SNAP-IV to discriminate the symptoms is apparently good (Swanson et al, 1983).

According to the copy of the MTA assessment provided in the NIMH MTA PUB, the SNAPADOL, SNAPPAR and SNAPTEA consisted of nine major subscales: Inattention, Hyperactivity, Impulsivity, ADD/WO, ODD, SNAP-Parent Total Score, ADHD, and Hyperactive/Impulsive (Fine and Kotkin, 2003).

Harter's Self-Perception Profile

Harter's Self-perception Profile for Children/Adolescents (SPPC) assesses children over the age of eight. This scale measures the child's perceived aptitude in various fields such as academics and athletics, and also determines their general sense of worth. The test is self-administered and has been modified for adolescents; there is also a version for parents and teachers. The SPPC is a 36-item self-reporting scale developed to examine a child's judgment of his/her competence, as well as a global perception of his/her self-worth or sense of esteem as a person (Harter, 1985). Harter's assessment contains six separate subscales consisting of five specific domains: scholastic competence, social acceptance, athletic competence, physical appearance, and behavioral conduct, as well as a general domain of global self-worth (Harter, 1985). It was developed on the assumption that an instrument providing separate measures of one's competence in various fields, as well as an independent assessment of one's global self-worth, would present a more detailed picture than those assessments providing only a specific self-concept score. An example of the process and questions (Harter, 1985):

Youth first read two statements and choose the description that is more like them, and then they choose whether the description is really true of them or sort of true of them. For example: "Some kids often forget what they learn" or "other kids can remember things easily." "Some teenagers do very well at their class work" or "other teenagers don't do very well at their class work."

The SPPC can be used in clinical settings for measuring self-esteem and perceived competence in children. An equivalent version is also available for use by other significant adult groups, such as parents, teachers, or counselors (Harter, 1985), which helps to grasp the evaluation as perceived by the child and by other adults. As these are important determinants of psychosocial adjustment and adaptation in children with chronic physical illnesses, the instrument has been used with physically ill children to understand more about their self-esteem and self-worth (Brown, 2000).

According to the NIMH MTA PUB CD, the HARTERA and the HARTERTA consist of eight individual subscales: Scholastic Competence, Social Acceptance, Athletic Competence, Physical Appearance, Job Competence, Romantic Appeal, Behavioral Conduct, and Close Friendship. The HARTERP displayed four separate subscales: Scholastic Competence, Social Acceptance, Athletic Competence, and Behavioral Conduct (Matson, 2009).

Research Design

The Conners, Harter, and SNAP-IV were the only assessments presented to three groups (adolescent, parent, and teacher). The researcher's study analyzed the assessments to determine the correlation among them. Further analyses were carried out to see if the IB, EB, AB, and SB constructs exist within all groups.

- *Research Question I:* The researcher used factor analysis along with an item analysis to examine how well the items in each of the hypothesized constructs relate to the construct which will help to verify the constructs empirically.

- *Research Question II:* The researcher calculated Cronbach's alpha to examine the reliability of IB, EB, AB, and SB for each group.

- *Research Question III:* The researcher used a modification of the MTMM matrices to examine the correlation among measures and within groups.

There are various statistical methods which can be used to study the relationship between independent and dependent variables. Factor analysis is used to study the patterns of relationships among items in a scale or test. The purpose is to discover something about the nature of the independent variables, which affect the outcome even though they are not measured directly. A principal axis factoring examined the underlying factors for theoretical purposes. Principal axis factoring also answered questions such as the number of (and classification of) factors, and relationship among the factors. Cronbach's alpha was used to analyze the reliability of the assessment subscales and nine assessments. When the correlations between the items increase, Cronbach's alpha generally increases. For this reason, the coefficient is also called the "internal consistency" or "internal consistency reliability" of the test (Bland, 2007). Once the factor analysis was completed, the reliability of the assessments and subscales was examined. The final step of the analysis was to use the MTMM, which examined the correlation among the constructs in the same subscale and assessed construct validity. This matrix enables the researcher to examine both convergent and discriminant validity at one time.

Since neither convergent nor discriminant validity was evident in the MTMM, an additional step was taken to examine the relationship between the scores of the Conners and SNAP-IV adolescent assessments. The process started with the raw scores for both assessments, which were included in the initial NIMH MTA PUB dataset. In order to be able to compare the raw scores, the T-score was calculated for all the scores in both assessments and the appropriate analyses were conducted on the T-score.

CHAPTER 4

Setup of the Analysis and Preliminary Data Examination

The Conners, Harter, and SNAP-IV were the only assessments that were presented

to three groups (adolescent, parent, and teacher). This study analyzed the assessments to

determine the correlation among them. Further analyses were carried out to see if the four

behavioral constructs—academic (AB), external (EB), internal (IB), and social (SB)—exist

within all groups. This chapter will present the results from the various statistical analyses

used in the study.

Factor Analysis

An exploratory factor analysis (EFA) was used in this study to uncover the

underlying structure of the variables in each assessment. A principal axis factoring (PAF) was

selected within the EFA to uncover the least number of factors which can account for the

common correlation of a set of variables. The next step was the use of the varimax rotation

method, which simplifies the data structure and subscales. The scree plots were also

examined for each factor analysis to help identify the number of factors. A natural break

point in the curve would signify the essential factors. Since this action did not clearly define

the break point, the number of factors that were in the assessment could not be determined

by using the scree plot alone.

Next, a rotation was selected to organize the output in a manner that would make it

easier to interpret. The varimax rotation, the most common option for rotation, was selected

to assist in the interpretation of the factors. This type of rotation created an orthogonal

rotation of the factor axes. This allowed the researcher to take full advantage of the variance of the squared loadings of a factor on all variables in a factor matrix. Each factor had a specific loading for each of the variables, which simplified the results. Using the varimax solution created results which made it possible to identify the factor with a single variable. Because of the large number of questions within the Conners and the fact that the factors would not load, a maximum iteration for convergence of 50 was used; however, a convergence of 25 was used for the rest of the assessments. In order to reduce the number of subscales that were recovered from the initial analysis of the Conners, the number of factors that were loaded were limited by only observing items that loaded above .40 on a specific factor. The factor analysis had to be completed on all nine assessments.

The subscales were labeled by using the central theme of the variables, which were grouped together by the factor analysis. The same format for labeling the subscales was used when assessing all subscales. For example, in the Conners Adolescent Self Report (CASR) factor analysis, Social Behavior was initially called CASubscale1. After reviewing all of the variables in the CASubscale1 group, the common theme or characteristic among them was social behavior. Therefore, CASubscale1 was labeled Social Behavior. This action was repeated for each of the subscales found by the factor analysis for all nine assessments, until each was labeled.

Once this labeling was completed, the assessments were combined into a single dataset using the stakeholder (adolescent, parent, and teacher) as the common variable. The subscales were not only labeled by similarities in subject matter but the name of the assessments also had to be applied. This prevented subscales to overlap when analyzed since

some of the labels were identical. Not all of the assessments identified the four common

constructs; however, there were common subscale labels among all three assessments.

Conners Factor Analysis

As stated the hypothesis, a prior assumption was that there would be four main

behavioral constructs which were evident within these variables. However, the following

tables not only showed the hypothesized factors but also the prominent additional factors.

The number of factors depended not only on the assessment but also on the individual it

was designed to evaluate.

The results of the factor analysis for the CASR were the most complex. The large

factor analysis was expected because there were over 100 items in the CASR. Also, the

Conners was an assessment that not only assesses ADHD but also other co-morbid

disorders such as ODD, depression, and learning disorders. The factor analysis resulted in

over 24 individual subscales within this assessment. Table 5 displays the labeled constructs,

codes, items, factor loading and construct reliability for the CASR assessments as a result of

the factor analysis.

Table 5: Conners Adolescent

Construct	Code	Items	Factor loading	Reliability
Social Behavior	CA100	Angry and resentful	.409	.904
	CA32	Get into fights	.425	
	CA29	Throw tantrums	.459	
	CA99	Touchy or easily annoyed	.494	
	CA30	People bug me and get me angry	.531	
	CA31	Temper gets me into trouble	.602	
	CA27	Many things irritate me	.610	
	CA93	I lose my temper	.695	
	CA28	Easily set off	.729	
	CA25	Hot temper	.747	
	CA26	Explode easily	.790	
Parent Relationship	CA101	Feel that people are unfair	.429	.851
	CA83	Rules in house are not clear	.470	
	CA77	Family does not do many fun things together	.483	
	CA89	Punishment in home is not fair	.535	
	CA75	Parents expect too much from me	.551	
	CA92	Parents only notice bad behavior	.567	
	CA91	Parents do not reward or notice good behavior	.573	
	CA76	Seems like my parents always criticizing me	.619	
	CA82	Parents too strict	.745	
	CA81	Parents discipline too harsh	.775	
Internal Behavior	CA18	Feel as if driven by a motor	.443	.867
	CA20	Difficulty with self-control	.453	
	CA15	Need to get up and move during homework	.483	
	CA17	Restless even when sitting still	.525	
	CA14	Trouble sitting still through a meal	.599	
	CA19	Too much energy to sit still for long	.647	
	CA12	Cannot sit still for long	.706	
	CA13	Tend to squirm and fidget	.719	
	CA64	Get nervous	.465	

Construct	Code	Items	Factor loading	Reliability
External Behavior	CA73	Discouraged	.475	.838
	CA69	Have nightmares	.545	
	CA71	Worry about little things	.558	
	CA65	Sad and gloomy	.571	
	CA74	Afraid to be alone	.628	
	CA68	Things scare me even if I don't admit it	.634	
	CA72	Feel like crying	.642	
Defiant Behavior	CA94	Argue with parents or authority	.423	.798
	CA44	Bend the rules when I can	.428	
	CA95	Defy request or rules from parents or others	.481	
	CA97	Deliberately do things to annoy other people	.569	
	CA96	Like to annoy my parents or authorities	.672	
Academic Behavior	CA60	Do not make effort for schoolwork	.415	.784
	CA61	Behind in my studies	.422	
	CA58	Trouble organizing schoolwork	.619	
	CA63	Very disorganized about homework	.659	
Confident Feelings	CA5	Trouble concentrating on one thing at a time	.443	.688
	CA6	Trouble keeping thoughts organized	.515	
	CA7	Sticking with things for more than few minutes is difficult	.566	
Violating Rules	CA34	Break rules	.437	.682
	CA33	Take things that do not belong to me	.499	
	CA35	Destroy property that belongs to others	.533	
Academic Processing	CA9	Lose place when reading	.454	.619
	CA62	Read slowly with a lot of effort	.484	
	CA53	Trouble with reading and spelling	.641	
Friendships	CA47	Lonely person	.536	.705
	CA46	Friends get fed up with me	.581	
	CA45	Trouble making and keeping friends	.625	
Focus/ Concentration	CA1	My mind is pretty sharp	-.658	.708
	CA2	Good head on my shoulders	-.635	
	CA3	Confident about my abilities	-.527	

Construct	Code	Items	Factor loading	Reliability
	CA4	Like myself	-.472	
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

The results for the CASR resulted in all four of the hypothesized constructs, of which the SB subscale had the highest number of items. Although some of the subscales could have been labeled using SB, they were more likely to be grouped together on another topic area, such as Parent Relations. Twenty additional subscales were present within the CASR factor analysis but were not of interest in this study.

The results for the factor analysis for the Conners Parent Rating Scale (CPRS) generated similar results to the CASR. All four of the hypothesized constructs were observed. Although the EB subscale had the highest number of items, SB also ranked high, with a total of ten items. Other items that were not of interest in this study were also present within the CPRS.

Table 6: Conners Parent

Construct	Codes	Items	Factor loading	Reliability
External Behavior	CP92	Poorly aware of surroundings or time of day	.407	.923
	CP86	Cannot stand too much excitement	.442	
	CP30	Does not act his/her age	.446	
	CP82	Always climbing	.449	
	CP84	Will run around between mouthfuls at meals	.475	
	CP91	Moods change quickly and drastically	.494	
	CP85	Demands met immediately or easily frustrated	.543	
	CP90	Acts as if driven by a motor	.707	
	CP53	Excitable, impulsive	.739	
	CP80	Constantly fidgeting	.751	
	CP54	Fails to finish things; short attention span	.752	
	CP79	Inattentive, easily distracted	.755	
	CP52	Restless or overactive	.789	
Social Behavior	CP92	Poorly aware of surroundings or time of day	.407	.902
	CP86	Cannot stand too much excitement	.442	
	CP30	Does not act his/her age	.446	
	CP82	Always climbing	.449	
	CP38	Carries a chip on shoulder	.464	
	CP84	Will run around between mouthfuls at meals	.475	
	CP70	Tells stories that did not happen	.477	
	CP91	Moods change quickly and drastically	.494	
	CP41	Sassy to grown-ups	.514	
	CP40	Bragging and boasting	.527	
Internal Behavior	CP37	Unhappy	.424	.775
	CP36	Allows punishment around other children	.470	
	CP42	Shy	.490	
	CP45	Has no friends	.505	
	CP44	Feelings easily hurt	.595	

Construct	Codes	Items	Factor loading	Reliability
	CP43	Afraid that they do not like him/her	.764	
Health	CP23	Vomiting	.455	.758
	CP21	Headaches	.618	
	CP24	Aches and Pains	.653	
	CP22	Stomach Aches	.795	
Controlling	CP78	Sets goals too high	.685	.814
	CP77	Things must be done same way every time	.793	
	CP76	Everything must be just so	.802	
Fearful	CP33	Clings to parents or other adults	.414	.730
	CP11	Worries about illness and death	.451	
	CP9	Afraid of people	.522	
	CP8	Afraid of new situations	.584	
	CP10	Afraid of being alone	.622	
	CP4	Restless	.656	
Sleep	CP5	Nightmares	.500	.751
	CP7	Can't fall asleep	.595	
	CP6	Awakens at night	.614	
Hostile	CP46	Feels cheated	.558	.824
	CP48	Fights constantly	.680	
	CP47	Mean	.722	
Aggressive	CP55	Temper outbursts, explosive and unpredictable behavior	.422	.798
	CP57	Throws or breaks things	.597	
	CP56	Throws him/herself around	.615	
Academic Behavior	CP67	Will not obey school rules	.472	.702
	CP63	Does not like to go to school	.619	
	CP62	Is not learning	.643	
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

The Conners Teacher Rating Scale (CTRS) factor analysis results were not as complex. There were only 39 items within these assessments, and as a result only seven subscales were identified. All four of the hypothesized constructs were present once the subscales were labeled. AB had the highest number of related items. Out of seven subscales, only three were not of interest in this study. The reliability scores were within the normal range. Table 7 displays a summary of the outputs produced from the factor analysis and Cronbach's alpha.

Table 7: Conners Teacher

Construct	Codes	Items	Factor loading	Reliability
Academic Behavior	CT9	Overly sensitive	.564	.958
	CT35	Excessive demands for teacher's attention	.568	
	CT18	Destructive	.570	
	CT20	Lies	.572	
	CT25	No sense of fair play	.575	
	CT14	Disturbs other children	.579	
	CT12	Sullen or sulky	.582	
	CT29	Teases other children or interferes with activities	.628	
	CT3	Demands must be met, or immediately frustrated	.657	
	CT17	Acts "smart"	.695	
	CT38	Uncooperative	.763	
	CT36	Stubborn	.768	
	CT16	Mood changes quickly and drastically	.787	
	CT32	Impudent	.792	
	CT15	Quarrelsome	.797	
	CT21	Temper outbursts, explosive and unpredictable	.800	
	CT31	Defiant	.880	
External Behavior	CT2	Hums and makes other odd noises	.489	.895
	CT11	Daydreams	.51	
	CT6	Excitable, impulsive	.595	
	CT8	Fails to finish things; short attention span	.674	
	CT5	Restless or overactive	.747	
	CT7	Inattentive, easily distracted	.766	
	CT1	Constantly fidgeting	.793	
Internal Behavior	CT24	Appears to be easily led	.424	.711
	CT30	Submissive	.427	
	CT10	Overly serious or sad	.517	
	CT26	Appears to lack leadership	.542	
	CT34	Fearful	.624	

Construct	Codes	Items	Factor loading	Reliability
	CT33	Shy	.656	
Social Behavior	CT22	Isolates him/herself from other children	.492	.832
	CT27	Does not get along with opposite sex	.613	
	CT23	Appears to be unaccepted by group	.736	
	CT28	Does not get along with same sex	.773	
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

Harter's Factor Analysis (SPPC)

The Harter – Adolescent Version (HARTERA) results were similar to the Conners,

yet they yielded fewer subscales. Unlike the Conners, which contained at least 75 items,

Harter's assessments have a maximum of 48 items. The same process for the factor analysis

was applied to Harter's that had been applied to the Conners. Once the subscales were

identified, labels were applied in accordance with the topic area of the items within the

subscales. A total of nine subscales were found in the HARTERA. Only two out of the four

hypothesized constructs were observed (SB and AB). The additional subscales were not

applicable to this study.

Table 8: Harter Adolescent

Construct	Code	Items	Factor loading	Reliability
Self-Appearance	HA36	Like the kind of person they are, but others do not	.474	.907
	HA27	Happy with themselves most of the time; but others are not	.500	
	HA31	Think they are good looking, but others do not	.539	
	HA9	Disappointed with themselves, but others are pleased	.552	
	HA45	Very happy the way they are, but others wish they different	.598	
	HA40	Like their looks, but others do not	.621	
	HA4	Not happy with the way they look but others are happy	.659	
	HA13	Wish their body was different; but others like their body	.710	
	HA22	Wish their physical appearance was different; but others do not	.789	
Athletic	HA30	Don't do well at new outdoor games, but others do not	.559	.880
	HA12	Do well in new activities, but others feel they might not do well	.759	
	HA21	Better than others their age at sports, but others do not	.770	
	HA39	Feel they are not athletic, but others do not	.773	
	HA3	Feel do well at sports but others don't feel they are good	.780	
Romantic Interest	HA42	Do not go out with people they would like to date, but others do not	.467	.791
	HA15	Not dating people they are attracted to, but others are	.486	
	HA33	Feel they are fun and interesting on a date, but others wonder	.516	
	HA6	Romantically interested and person like back but others not	.530	
	HA24	People their age romantically attracted to them; but others not	.664	
	HA20	Some teens are very hard to like, but others are easy	.436	
	HA8	Easy to make close friends but others find it hard	.451	

Construct	Code	Items	Factor loading	Reliability
Social Behavior	HA35	Hard to make friends they can trust, but others do not	.453	.850
	HA29	Popular with others their age, but others are not	.457	
	HA38	Feel they are socially accepted, but others wished	.494	
	HA2	Hard to make friends but others say it easy	.538	
	HA11	A lot of friends, but others teens do not have many	.630	
Sharing Behavior	HA26	Wish they had close friends to share with; but others do not	.708	.824
	HA17	Have close friends they can share secrets with; but others do not	.741	
	HA44	Have friends they can share personal thoughts and feelings with, but others do not	.806	
Academic Behavior	HA1	Some feel they are smart but others are not sure	.462	.795
	HA37	Feel they are pretty intelligent, but others do not	.541	
	HA19	Do well at classwork, but others do not	.602	
	HA10	Slow in finishing homework, but others are quick	.688	
	HA28	Trouble figuring out the answers, but others do not	.725	
Behavior/ Deliberate actions	HA7	Do the right thing, but others do not know what is right	.556	.764
	HA16	Get in trouble for the things they do, others do not	.664	
	HA34	Do things they know they shouldn't do, but others do not	.667	
	HA43	Usually act the way they are supposed to, but others do not	.668	
Employment	HA14	Don't have skills to do job well, but others feel they do	.470	.767
	HA41	Able to handle work at job, but others wonder	.633	
	HA5	Do well at a PT job and others not ready to handle PT job	.698	
	HA23	Old enough to get and keep job; but others do not	.716	

Construct	Code	Items	Factor loading	Reliability
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

The Harter-Parent Version (HARTERP) assessment was comprised of 15 items, and only three subscales resulted from the factor analysis. Out of those three subscales, three of the four constructs could be identified once the labeling was completed. SB had the highest reliability score (.847), which is within the normal range. The HARTERP assessment also seemed to have approximately the same number of items within each construct.

Table 9: Harter Parent

Construct	Code	Items	Factor loading	Reliability
Social Behavior	HP2	Hard to make friends?	.540	.847
	HP10	Popular with others?	.628	
	HP6	Has a lot of friends?	.642	
	HP11	Does well at new games?	.686	
	HP7	Is better than others his/her age at sports?	.766	
	HP3	Does well at sports?	.779	
External Behavior	HP12	Gets in trouble?	.683	.87
	HP4	Usually well-behaved?	.745	
	HP8	Acts appropriately?	.789	
Academic Behavior	HP5	Remember things easily?	.701	.814
	HP1	Good at schoolwork?	.714	
	HP9	Trouble figuring out answers in school?	.804	
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

The Harter- Teacher Version (HARTERT) yielded similar results to the HARTERP. The HARTERT had 12 items while the HARTERP had 16 items within the assessment. The difference between the assessments was in the number of subscales that could be identified. Although the factor analysis had three subscales, the only hypothesized construct that was observed was the SB. All the other labeled subscales were not necessary for this study.

Table 10: Harter Teacher

Construct	Code	Items	Factor loading	Reliability
Performance Behavior	HTA5	Doesn't do well at job?	.548	.850
	HTA13	Does well at job?	.665	
	HTA9	Does well at schoolwork?	.709	
	HTA15	Acts the way s/he is supposed to?	.789	
	HTA7	Does the right thing?	.815	
Social Behavior	HTA14	Dating someone s/he has interest in?	.548	.859
	HTA6	Like by those romantically interested in?	.636	
	HTA10	Is popular?	.642	
	HTA2	Has a lot of friends?	.653	
	HTA8	Is able to make close friends?	.669	
	HTA16	Doesn't have friends s/he can trust?	.671	
Athletic Behavior	HTA12	Good-looking?	.518	.804
	HTA4	Nice physical appearance?	.541	
	HTA11	Is athletic?	.747	
	HTA3	Good at sports?	.877	
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

SNAP-IV Factor Analysis

The factor analysis for the SNAP-IV followed the same process as both the Conners and Harter's assessments. All of the assessments had 39 items, which produced a more consistent number of subscales; AB had the most number of items present in all three assessments. As a result, no more than seven subscales were identified within the SNAP-IV assessments. The SNAP-IV – Adolescent version (SNAPADOL) factor analysis resulted in seven subscales. Not only were all four of the hypothesized constructs present, but three additional constructs were also identified.

Table 11: SNAP-IV Adolescent

Construct	Code	Items	Factor loading	Reliability
Academic Behavior	SNA23	Shifts from uncompleted activity to another	.426	.918
	SNA10	Fidget with hands/feet or squirming in seat	.435	
	SNA24	Fails to finish projects	.442	
	SNA7	Lost things needed for task or activities	.543	
	SNA8	Easily distracted by extraneous stimuli	.579	
	SNA1	Fails to give close attention to detail	.591	
	SNA9	Forgetful in daily activities	.598	
	SNA6	Avoided, reluctant, or difficulties with tasks requiring mental effort	.629	
	SNA25	Difficulty concentrating on school or task requiring attention	.638	
	SNA3	Did not seem to listen to what was being said	.648	
	SNA4	Does not follow through on instructions, schoolwork, chores	.658	
	SNA2	Difficulty sustaining attention in task or play	.679	
	SNA5	Difficulty organizing task and activities	.701	
External Behavior	SNA14	Always on the go or driven by motor	.425	.844
	SNA27	Called out in class or situation when silence was expected	.465	
	SNA29	Moved about excessively	.511	
	SNA26	Difficulty sticking to play activity	.512	
	SNA13	Difficulty playing or engaging in leisure activities quietly	.544	
	SNA11	Left seat in classroom or other situation	.570	
	SNA12	Ran about or climbed excessively where inappropriate	.661	
	SNA28	Needed a lot of supervision	.662	
	SNA35	Blame others for mistakes or misbehaviors	.401	

Construct	Code	Items	Factor loading	Reliability
Internal Behavior	SNA31	Lost temper	.596	.836
	SNA36	Were touchy or easily annoyed by others	.667	
	SNA38	Spiteful or vindictive	.671	
	SNA37	Angry and resentful	.864	
Social Behavior	SNA30	Acting before thinking	.424	.771
	SNA27	Calling out in class or situation when silence was expected	.434	
	SNA18	Interrupt or intrude on others	.519	
	SNA15	Talk excessively	.582	
	SNA16	Blurt out answers to questions before the question is completed	.667	
Emotional Behavior	SNA23	Shifts from uncompleted activity to another	.407	.732
	SNA21	Apathetic or unmotivated in goal-directed activity	.542	
	SNA20	Low in energy, sluggish, drowsy	.562	
Defiant Behavior	SNA32	Argued with adults	.488	.809
	SNA33	Actively defied or refused adult request or rules	.617	
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

SNAP-IV – Parent Version (SNAPPAR) and SNAP-IV – Teacher Version

(SNAPTEA) had the same number of items within the assessments; the factor analysis only

identified four subscales. Interestingly, all four of the hypothesized constructs were present;

AB had the most number of items within the subscales and the highest reliability scores.

Table 12 and Table 13 offer summaries of the output from the Factor Analysis and

Cronbach's alpha for the SNAP-IV Parent and Teacher.

Table 12: SNAP-IV Parent

Construct	Code	Items	Factor loading	Reliability
Academic Behavior	SN28	Needs a lot of supervision	.467	.961
	SN3	Does not seem to listen to what is being said	.574	
	SN23	Shifts from one uncompleted activity to another	.582	
	SN24	Failed to finish things started	.686	
	SN2	Difficulty sustaining attention in task or play	.693	
	SN7	Loses things necessary for tasks or activities	.705	
	SN8	Easily distracted by stimuli	.709	
	SN9	Forgetful in daily activities	.719	
	SN6	Avoids, reluctant, difficulty engaging in tasks that need mental effort	.744	
	SN1	Fails to give attention to details; careless mistakes in schoolwork	.753	
	SN4	Does not follow through on instructions and fails to finish schoolwork	.759	
	SN25	Difficulty concentrating on school work or task requiring attention	.790	
	SN5	Difficulty organizing tasks and activities	.810	
Social Behavior	SN22	Engages in physically dangerous activity without thinking of consequences	.466	.934
	SN26	Difficulty sticking to play activity	.514	
	SN10	Fidgets with hands or feet or squirms	.553	
	SN18	Interrupts or intrudes on others	.567	
	SN27	Calls out in class or situation when silence was expected	.582	
	SN17	Difficulty waiting in lines or turn in games or group	.611	
	SN16	Blurts out answers to questions before they are completed	.615	
	SN15	Talks excessively	.629	
	SN11	Leaves seat in classroom or other situations where seating expected	.629	
	SN12	Runs about or climbs excessively	.630	

Construct	Code	Items	Factor loading	Reliability
	SN13	Difficulty playing or engaging in leisure activities quietly	.679	
	SN29	Moves about excessively	.707	
	SN14	Always on the go or acts if driven by a motor	.722	
External Behavior	SN30	Acts before thinking	.459	.944
	SN35	Blames others for mistakes or misbehaviors	.629	
	SN39	Swears or uses obscene language	.654	
	SN38	Spiteful or vindictive	.674	
	SN34	Does things deliberately that annoy other people	.682	
	SN36	Touchy or easily annoyed by others	.701	
	SN33	Actively defies or refuses adult request or rules	.720	
	SN32	Argues with adults	.741	
	SN31	Loses temper	.770	
	SN37	Angry and resentful	.812	
Internal Behavior	SN19	Stares into space and daydreams	.457	.686
	SN21	Apathetic or unmotivated in goal directed activities	.552	
	SN20	Low in energy level, sluggish, drowsy	.756	
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

Table 13: SNAP-IV Teacher

Construct	Code	Items	Factor loading	Reliability
Academic Behavior	SNT26	Difficulty sticking to play activity	.460	.956
	SNT23	Shifts from one uncompleted activity to another	.545	
	SNT19	Stares into space and daydreams	.619	
	SNT7	Loses things necessary for tasks or activities	.644	
	SNT8	Easily distracted by stimuli	.645	
	SNT21	Apathetic or unmotivated in goal-directed activities	.721	
	SNT3	Does not seem to listen to what is being said	.744	
	SNT9	Forgetful in daily activities	.765	
	SNT6	Avoids, reluctant, difficulty engaging in tasks that need mental effort	.768	
	SNT2	Difficulty sustaining attention in task or play	.769	
	SNT1	Fails to give attention to details; makes careless mistakes in school	.774	
	SNT24	Failed to finish things started	.796	
	SNT5	Difficulty organizing tasks and activities	.812	
	SNT25	Difficulty concentrating on school work or task requiring attention	.820	
	SNT4	Does not follow through on instructions and fails to finish schoolwork	.843	
External Behavior	SNT28	Needs a lot of supervision	.545	.954
	SNT30	Acts before thinking	.565	
	SNT18	Interrupts or intrudes on others	.576	
	SNT10	Fidgets with hands/feet, or squirms in seat	.595	
	SNT15	Talks excessively	.635	
	SNT16	Blurted our answers to questions before they are completed	.648	
	SNT17	Difficulty waiting in lines or turn in games or group	.653	
	SNT13	Difficulty playing or engaging in leisure activities quietly	.672	
	SNT27	Calls out in class or situation when	.693	

Construct	Code	Items	Factor loading	Reliability
External Behavior		silence was expected		.954
	SNT11	Leaves seat in classroom or other situations where being seated is expected	.698	
	SNT12	Runs about or climbs excessively	.758	
	SNT29	Moves about excessively	.807	
	SNT14	Always on the go or acts as if 'driven by a motor'	.827	
Social Behavior	SNT22	Engages in physically dangerous activity without thinking of consequences	.464	.945
	SNT39	Swears or uses obscene language	.619	
	SNT34	Does things deliberately that annoy other people	.699	
	SNT33	Actively defies or refuses adult request or rules	.732	
	SNT31	Loses temper	.753	
	SNT32	Argues with adults	.759	
	SNT35	Blame others for mistakes or misbehaviors	.764	
	SNT36	Touchy or easily annoyed by others	.771	
	SNT38	Spiteful or vindictive	.778	
	SNT37	Angry and resentful	.828	
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.				

In all the tables listed, the reliability of each assessment was also measured. The scores for all three assessments range from .760, which is adequate for confirmatory purposes, to as high as .969, which is considered good for confirmatory purposes. Overall, one can see that the Cronbach's alpha for the assessments on average fall within the normal range. As stated previously, Cronbach's alpha cannot be used alone. There must also be a

substantive arguments and possibly other statistical measure to support the theory. The table below displays the results for the Cronbach's alpha:

Table 14: Cronbach's Alpha

Assessment	Adolescent	Parent	Teacher
Conners	.940	.960	.952
Harter	.932	.760	.847
SNAP-IV	.949	.967	.969

Multitrait-Multimethod Matrix

Testing for common method variance is another form of statistical measures. Garson (2009) stated the common method variance occurs when correlations or part of them were not due to actual relationships between variable; however, they were measured by the same method. An MTMM approach was used to measure common method variance, and assess the construct validity. The MTMM examines both convergent and discriminant validity (Trochim, 2006), and this study measured each of the traits using several methods.

Once the common subscales were identified and the reliability was examined for the assessments and constructs, an MTMM was used to examine the construct validity of the subscales that were identified after the factor analysis. The MTMM examined the correlation among measures and within groups. According to Trochim (2006), the basic principles or rules for the MTMM are:

- Coefficients in the reliability diagonal should consistently be the highest in the matrix.

- Coefficients in the validity diagonals should be significantly different from zero and high enough to warrant further investigation.

- A validity coefficient should be higher than values lying in its column and row in the same heteromethod block.

- A validity coefficient should be higher than all coefficients in the heterotrait-monomethod triangles.

- The same *pattern* of trait interrelationship should be seen in all triangles.

The correlation matrix was created by using the common subscales and stakeholders used throughout the study. The adolescent, parent, and teacher were measured in separate groups. Each matrix includes the identified common subscales for Conners, Harter, and SNAP-IV. The methods consisted of the Conners, Harter and SNAP-IV assessments. The traits involved in the analysis included a combination of the four hypothesized behavioral constructs. The measures were repeated for the adolescent and teacher matrices. The MTMM was a correlation matrix between measures; however, instead of the number '1' along the reliability diagonal, the calculated reliability of each subscale would replace the number in the diagonal. The remainder of the matrix shown in Table 15 consisted of the calculated correlations. The adolescent data set was used to develop the first matrix. The adolescent versions of the Conners, Harter, and SNAP-IV had two common subscales: AB and SB. In addition to these, the Conners and SNAP-IV had three additional subscales in

common: EB, IB, and "defiant behavior." Table 15 displays the adolescent correlation MTMM.

Table 15: Adolescent Correlations MTMM

	CS SB	CS AB	CS EB	CS IB	SS SB	SS AB	SS EB	SS IB	HS SB	HS AB
CS SB	.904									
CS AB	.508**	.784								
CS EB	.609**	.485**	.867							
CS IB	.518**	.434**	.478**	.834						
SS SB	.014	-.016	-.032	-.015	.767					
SS AB	.010	-.017	-.045	.008	.577**	.917				
SS EB	-.027	.013	-.040	-.007	.609**	.683**	.843			
SS IB	-.042	.030	-.071	-.035	.520**	.507**	.504**	.833		
HS SB	-.008	-.041			.108*	.059			.851	
HS AB	.002	-.010			-.020	-.045			.359**	.794
*. Correlation is significant at the .05 level (2-tailed).										
**. Correlation is significant at the .01 level (2-tailed).										

RELIABILITY DIAGONAL
HETEROTRAIT-MONOMETHOD TRIANGLE
VALIDITY DIAGONALS
HETEROTRAIT-HETEROMETHOD TRIANGLES

The heterotrait-monomethod triangles labeled in green were the correlations among measures that share the same method. A strong "methods" factor means the correlations were high. The heterotrait-heteromethod triangles in blue were correlations that were not similar in both the method and trait, and the monomethod blocks examine all of the

correlations which share the same method of measurement. The monomethod blocks are made up of the reliability diagonal and the heterotrait monomethod triangles. The heteromethod block is made up of the validity diagonal and heterotrait heteromethod triangles. The heteromethod blocks examine all the correlations which did not share the same methods.

The adolescent correlation MTMM illustrated the relationship among the Conners, Harter, and SNAP-IV subscales. The monomethod block showed the correlations which share the same form of assessment or method of measurement. Within the monomethod blocks were the heterotrait monomethod triangles, highlighted in green. These triangles show correlations that had the same assessments, but different traits. The yellow and green highlighted section of Table 15 represented the monomethod blocks. The heteromethod blocks, shown in blue and orange, were correlations that did not share the same methods.

Interpreting the MTMM can be complex, as each section of the matrix has correlations with a distinctive purpose or meaning. The reliability diagonal for the adolescent correlation MTMM in yellow estimates the reliability of each measure in the matrix. All of the reliability scores within the matrix were consistently the highest in the matrix, ranging from .767 to .917. The validity diagonals are correlations between the same trait, measuring different methods. The scores ranged from .108 to -.045 and were not significantly different from zero. The validity coefficients were not always higher than values lying in its column and row in the same heteromethod block. In other words, the validity diagonals ranged from -.045 to .108 and the columns and rows ranged between -.045 to .359. The validity coefficients were higher than all coefficients in the heterotrait-monomethod triangles. Therefore this points out that trait factors were stronger than the methods factors. However,

the same pattern of trait interrelationship cannot be seen in all triangles. For example, CSSB-CSAB is .508, which is not larger than CSSB-CSEB .609, with CSSB-CSIB at .518. In order to have a trait interrelationship, the coefficient within the CSSB-CSAB relationship should be approximately twice as large as the coefficients within the relationships between CSSB-CSEB and CSSB and CSIB. Table 16 displays the MTMM for parent correlations.

Table 16: Parent Correlations MTMM

	CP AB	CP SB	CP EB	SP AB	SP SB	SP EB	HP AB	HP SB	HP EB
CP AB	.700								
CP SB	.494**	.900							
CP EB	.436**	.692**	.926						
SP AB	-.041	.012	-.018	.961					
SP SB	-.059	-.057	-.056	.730**	.933				
SP EB	-.092*	-.074	-.071	.681**	.740**	.944			
HP AB	-.227**	-.103*	-.087*	-.043	-.008	.027	.814		
HP SB	-.103*	-.113**	-.125**	.003	-.004	-.008	.142**	.847	
HP EB	-.264**	-.304**	-.249**	-.018	-.002	.027	.412**	.232**	.867

**. Correlation is significant at the .01 level (2-tailed).
*. Correlation is significant at the .05 level (2-tailed).

RELIABILITY DIAGONAL
HETEROTRAIT-MONOMETHOD TRIANGLE
VALIDITY DIAGONALS
HETEROTRAIT-HETEROMETHOD TRIANGLES

The parent correlation MTMM presented results which were similar to the adolescent MTMM, though the matrix had a slightly less variability within the assessments. As with the adolescent MTMM, there was a clear dissimilarity specifically between the

Conners and the SNAP-IV assessments when observing all stakeholders. All of the reliability scores within the matrix except for one (CPAB: .700) were consistently the highest in the matrix, ranging from .814 to .961. The validity diagonals are correlations between the same trait, measuring different methods. The scores ranged from -.027 to .108 and were not significantly different from zero. The validity coefficients were not always higher than values lying in its column and row in the same heteromethod block. In other words, the validity diagonals ranged from -.249 to .027 and the columns and rows ranged between -.304 to .027. The validity coefficients were higher than all coefficients in the heterotrait-monomethod triangles. Therefore this pointed out that trait factors were stronger than the methods factors. However, the same pattern of trait interrelationship could not be seen in all triangles. Table 17 displays the MTMM for the teacher correlations.

Table 17: Teacher Correlations MTMM

	CT AB	CT EB	ST AB	ST EB
CT AB	.958			
CT EB	.710**	.897		
ST AB	.018	.038	.957	
ST EB	.037	.090	.597**	.952

**. Correlation is significant at the .01 level (2-tailed).

| RELIABILITY DIAGONAL |
| HETEROTRAIT-MONOMETHOD TRIANGLE |
| VALIDITY DIAGONALS |
| HETEROTRAIT-HETEROMETHOD TRIANGLES |

The teacher correlation MTMM only had two common traits (AB and EB) and two methods (Conners and SNAP-IV). As a result, this created a very small matrix. The reliability scores within the matrix were consistently the highest correlations, ranging from .897 to .958. The validity diagonals correlation was .037. The validity coefficients were not always higher than values lying in its column and row in the same heteromethod block. In other words, the validity diagonal correlation was .037 and the columns and rows correlations extended from .018 to .090. The validity coefficients were higher than all coefficients in the heterotrait-monomethod triangles. Therefore this pointed out that trait factors are stronger than the method factors. This is slight but noticeable and may suggest some evidence of convergent validity.

The results of the MTMM brought about an investigation which examined why the correlations did not result in convergent or discriminant validity. An explanation could be the period in which the assessments were given. After examining the NIMH MTA PUB database and summary, it was concluded that all the assessments were given within the same period with the exception of CASR, which was given in an earlier period. The phraseology and evaluation of the questions were also taken into consideration. Another interesting fact was that the SNAP-IV adolescent version contains items from the Conners Index Questionnaire and the IOWA Conners Questionnaire. Overall, it was unclear why the SNAP-IV and Conners would not have a high correlation when compared in any of the three MTMMs.

Clinical Analysis of Conners and SNAP-IV Adolescent

The results of the MTMM did not show evidence of convergent or discriminant validity especially among the Conners and SNAP-IV assessments. It was important to take an additional step to examine the relationship between the scores of the Conners and SNAP-IV Adolescent. From this analysis, potential relationships between the assessments could be discerned. Since there was more than one category of raw scores within both assessments, only the ADHD and hyperactivity categories were explored. This study primarily focused on ADHD, and hyperactivity at times can be confused with ADHD. A cross-tabulation was necessary to examine the relationship among the responses (raw scores) in both assessments. T-scores were calculated from the raw scores that were in the original NIMH MTA PUB data set, which were then recoded as 1 or 0 depending on where they fell in the percentile guidelines. With the standard deviation and mean inserted into the T-score formula, SPSS calculated the T-scores for both the Conners and SNAP-IV assessments. Once the T-scores were calculated, a cross-tabulation was carried out to examine the relationship between both assessments; according to both, a T-score of 55 was defined as slightly atypical (borderline: should raise concern). The T-scores were placed into two categories: (1) any score above 55 would be equal to 1 and (2) anything below 55 would be equal to 0. This allowed the T-scores to be separated into two newly defined variables. The cross-tabulation examined these two new variables which as a result categorized the calculated T-scores. Cells that have an imbalanced number of cases in the output would be a sign of interaction between the variables. Table 18 shows the output for both the Conners and SNAP-IV adolescent cross-tabulation.

Table 18: Conners and SNAP-IV Adolescent Cross-tabulation T-score Cutoff

ADHD Crosstabulation (Conners and SNAP-IV)					
			ADHD_snap		
			0	1	Total
ADHD_ conners	0	Count	301	118	419
		% of Total	51.9%	2.3%	72.2%
	1	Count	116	45	161
		% of Total	2.0%	7.8%	27.8%
Total		Count	417	163	580
		% of Total	71.9%	28.1%	1.0%
Hyperactivity Crosstabulation (Conners and SNAP-IV)					
			HYP_snap		
			0	1	Total
HYP_ conners	0	Count	333	85	418
		% of Total	57.5%	14.7%	72.2%
	1	Count	130	31	161
		% of Total	22.5%	5.4%	27.8%
Total		Count	463	116	579
		% of Total	8.0%	2.0%	1.0%

Table 18 displays the results of the cross-tabulation. The ADHD output illustrated that 59.7% of the responses were in agreement for both of the assessments, and the Hyperactivity output displayed a total of 62.9% of agreement within both of the assessments when observing commonalities in T-scores. The results for the cross-tabulation showed a moderate agreement among ADHD and Hyperactivity raw scores for the SNAP-IV and CASR.

CHAPTER 5

Data Findings and Recommendations

The purpose of this study was to analyze the relationship of responses given by parents (P), teachers (T), and adolescents (A) to the Conners, SNAP-IV, and Harter's assessments to determine if these assessment measures contain four behavioral constructs: academic (AB), external (EB), internal (IB), and social (SB). Furthermore, the study examined whether the constructs can be reliably determined for parents, teachers and adolescents jointly and independently for each subgroup. Subsequently, a parallel set of correlation analyses was used to see the extent to which the four hypothesized constructs (AB, EB, IB, and SB) were related.

The following research questions were addressed:

- Could the constructs of AB, EB, IB, and SB be verified using the subsets of items from the Conners, Harter's, and SNAP-IV?

- Did the constructs of AB, EB, IB, and SB exist for adolescents, parents, and teachers? Could these structures be confirmed for each group?

- To what extent did the constructs from the Conners, Harter's, and SNAP-IV show evidence of convergent and discriminant validity?

- To what extent did parents, teachers, and adolescents agree in their assessment of AB, EB, IB, and SB on the three measures?

This chapter examined the research questions by presenting the findings, discussing the findings, and offering implications and recommendations for subsequent research. Factor analysis was used to analyze the structures of the three assessment measures. As a result, the variables were classified into subscales. Each subscale was labeled by examining the language of each variable and the relationship among the variables that fell into the same category. The items that constituted the various constructs for the adolescents, parents, and teachers were similar across the groups. For example, AB referred to the actions or reactions of a child in relation to the educational environment. The behaviors could be conscious or unconscious, overt or covert, and voluntary or involuntary. A few examples of AB were not completing homework, poor performance on tests, and poor class attendance. This definition was used when analyzing the items within all of the assessments.

Many of the assessment's factor analyses resulted in more than ten subscales. Therefore only subscales that consisted of more than three items were provided a label. Finally, a multitrait-multimethod analysis was conducted for the constructs identified in each of the ADHD assessments to examine evidence for convergent and discriminant validity.

Conners Constructs

The results for the Conners factor analysis varied among the parent, teacher, and adolescent assessments. There were over 100 items in the Conners Adolescent Self Report (CASR) and the factor analysis resulted in 24 separate subscales, only 11 of which were identified and labeled in this study. The CASR had five major constructs: all four hypothesized constructs (AB, EB, IB, and SB) were present, and the fifth construct was "defiant behavior." Of the four hypothesized constructs that were observed within the

subscales, SB displayed the highest factor loadings and therefore was the most well-defined. There were eleven items within the SB subscale with a reliability coefficient of .904, the highest among all of the subscales for the CASR. IB and EB had eight items each and reliability coefficients of .867 and .838, respectively. AB had the least number of items and a reliability coefficient of .784.

The Conners Parent Rating Scale (CPRS) consisted of 93 items. The factor analysis resulted in 24 clusters; however, only 10 were identified and labeled. All four of the hypothesized constructs were observed within the CPRS subscales. EB had 12 items and a reliability score of .923, which was the highest score among all of the subscales for the CPRS. SB consisted of 10 items with a reliability score of .902. IB consisted of six items with a reliability score of .775, while only three items fell into the AB construct, where the reliability score was .702.

The Conners Teacher Rating Scale (CTRS) consisted of only 39 items and the factor analysis resulted in seven subscales. Only four of the subscales contained more than one or two items. Notably, all four possible constructs were observed within the CTRS labeled subscales. AB had the highest number of items, and the reliability for this subscale was .958. EB followed with a reliability score of .895 among seven items, and IB had the lowest reliability of .711 and six items. Finally, SB had only four items in the CTRS, and a reliability score of .832.

In summary, the three Conners assessments' factor analyses resulted in a varying number of subscales. Both the CASR and the CPRS had a total of 24 clusters while the CTRS had only seven. It is important to note that all four of the hypothesized constructs were observed in all three of the assessments. While the CTRS labeled subscales consisted of

four hypothesized constructs, the CASR and the CPRS encompassed additional constructs such as Parent Relationship, Confident Feelings, Violating Rules, Academic Processing, Friendships, Focus/Concentration, Health, Controlling, Fearful, Sleep, and Hostile and Aggressive Behavior.

NIMH used the term "summary measure" to refer to the original subscales identified in all nine of the assessments (see Appendix A). There were overlaps in the constructs identified from the factor analysis and the initial summary measures. The CASR factor analysis identified four of the hypothesized constructs and NIMH listed seven CASR summary measures. Three out of the seven summary measures were similar to the constructs identified from the factor analysis (Emotional Problems – IB, Anger Control Problems – SB, and Hyperactivity – EB). Unlike the other two Conner's rating scales, the CASR did not find the hypothesized construct AB in the common scales posited by NIMH. The CTRS factor analysis identified four of the hypothesized constructs, while the NIMH listed nine individual summary measures. Three of the CTRS summary measures were similar to the constructs identified from the factor analysis (Anxious/Shy – IB, Restless/Disorganized – EB, and Learning Problem – AB). Lastly, the CPRS listed a total of nine summary measures, and four of the possible constructs were identified. Unlike the other Conner's assessments, four of the summary measures were similar to the factor analysis constructs (Hyperactivity – EB, Conduct Problem – AB, Anxious/Passive – IB, and Asocial – SB).

Overall, the Conners' factor analysis results displayed multiple subscales, and all four of the hypothesized constructs were evident. Initially the summary measures for the Conner's rating scale varied for each assessment. The CASR had seven summary measures while the CTRS and CPRS had a total of nine. The CASR consisted of items such as Family

Problems, Emotional Problems, Conduct Problems, Anger Control Problems, Hyperactivity, and ADHD index. The CTRS summary measures consisted of the same similar summary measures in addition to Anxious/Passive, Asocial, Daydream, and IOWA Inattentive/Overactivity. The CPRS summary measures were comprised of Anxious/Shy, Restless/Disorganized, Learning Problems, Psychometric, Obsessive, Antisocial Factor, and Hyperactive/Immature. Although the labels of the hypothesized constructs differed from the individual summary measures, the items within the summary measures were similar to those of the hypothesized constructs.

SNAP-IV Constructs

The results for the SNAP-IV factor analysis varied among parent, teacher, and adolescent assessments. The SNAP-IV Adolescent Version (SNAPADOL) consisted of a total of 39 items. The factor analysis of the SNAPADOL resulted in seven clusters, of which only six were labeled as subscales. Four of the constructs were identified within the first four subscales. AB had 12 items and a reliability score of .918; EB consisted of eight items and .844 for reliability; IB and SB had five items each, with reliability of .836 and .771, respectively. An additional subscale was labeled as EB (three items; reliability .732).

SNAP-IV Parent Version (SNAPPAR) had 39 items but only four clusters resulted from the factor analysis. All four of the constructs were identified from the SNAPPAR factor analysis. AB had a total of 13 items that fell within the subscale and a reliability score of .961; SB consisted of 13 items and a reliability score of .934; and EB had a reliability score of .944 among 10 items. The fourth subscale was labeled IB and had three items with a reliability coefficient of .686.

Finally, the factor analysis of the SNAP-IV Teacher Version (SNAPTEA), which also consisted of 39 items, resulted in three clusters. The three subscales were among the four hypothesized constructs. AB had a total of 15 items that fell within the subscale and a reliability score of .956; EB consisted of 13 items and a reliability score of .954; and SB had a reliability score of .945 among 10 items.

In summary, all three SNAP-IV assessments' factor analyses resulted in a varying number of subscales. The SNAPADOL resulted in seven clusters while the SNAPPAR and SNAPTEA had four and three clusters, respectively. The four hypothesized constructs were only evident in the SNAPADOL and the SNAPAR, while the SNAPTEA factor analysis only identified three constructs (AB, EB, and SB). The additional labeled constructs that were identified in the SNAPADOL consisted of EB and Defiant Behavior.

There were commonalities in the constructs identified from the SNAP-IV factor analysis and the initial summary measures from NIMH. The SNAPADOL factor analysis identified four of the hypothesized constructs and NIMH listed eight summary measures. Three of the eight summary measures were similar to the possible constructs (Inattention – AB, Impulsivity – SB, and ODD – IB). The SNAPPAR factor analysis identified four of the hypothesized constructs, while the NIMH listed eight individual summary measures. There were similarities between the summary measures and all four hypothesized constructs, yet only two aspects of SB were observed (Inattention – AB, Hyperactivity – SB, Impulsivity – SB, ADD/WO – IB, and ODD – EB). Finally, the SNAPTEA listed a total of eight summary measures, and three of the hypothesized constructs were identified. Inattention – AB, Hyperactivity – EB, Impulsivity – EB, and ODD – SB were the similarities among the summary measures and constructs.

All in all, the factor analysis results resulted in multiple subscales. All four of the hypothesized constructs were evident in SNAPADOL and SNAPPAR. SNAPTEA displayed three of the hypothesized constructs (Academic, Social and External Behaviors). There were eight summary measures identified by NIMH (Inattention, Hyperactivity, Impulsivity, ADD/WO, ODD, Total Score, ADHD, Hyperactivity/Impulsivity). Although the labels of the hypothesized constructs differed from the summary measures, the items with in the summary measures were similar to those of the hypothesized constructs. The items from the DSM-IV criteria for Attention (ADHD) were included within the rating scales summary measures. In addition to the DSM-IV, the SNAP-IV contained items from the Conners Index Questionnaire and the IOWA Conners Questionnaire. These factors were related to the additional constructs seen in the NIMH summary measures.

Harter Constructs

The Harter – Adolescent Version (HARTERA) consisted of 45 items. The HARTERA factor analysis resulted in nine clusters; however, only eight subscales were labeled. Only two out of the four hypothesized constructs were observed among the subscales. SB and AB were present within the results of the HARTERA factor analysis. SB consisted of seven items with a reliability score of .850, and AB had seven items with a reliability score of .795. The other constructs included in the cluster measured topic areas including Self-Appearance, Athletics, Romance, Interests, Sharing Behavior, Behavior/Deliberate Actions and Employment.

The factor analysis of the Harter – Parent Version (HARTERP) consisted of 12 items. Although the number of items was less than the HARTERA and HARTERT, three

out of four of the hypothesized constructs were present after the factor analysis. Six of the HARTERP assessment items were classified in the SB category and resulted in a .847 reliability score; EB and AB each had three items, whose reliability scores were .870 and .814, respectively.

The Harter – Teacher Version (HARTERT) yielded similar results to the HARTERP. There were a total of 16 items in the HARTERT assessment and the factor analysis resulted in a total of three subscales; however, only one of the hypothesized constructs was present. SB had six items, with a .847 reliability score. Of the two remaining constructs, which were labeled Performance Behavior and Athletic Behavior, the former contained some items that referred to AB.

The Harter assessments' factor analyses resulted in varying number of subscales. The HARTERA resulted in nine clusters while the HARTERP and HARTERTA had three clusters. Only two of the hypothesized constructs were only evident in the HARTERA. The HARTERP and factor analysis identified three constructs (AB, EB, and SB). The HARTERTA identified three subscales, but only one out of the four hypothesized constructs was confirmed (SB).

There were overlaps in the subscales identified from the Harter factor analysis and the initial summary measures listed by NIMH. The HARTERA factor analysis identified two out of the four of the hypothesized constructs. NIMH listed nine summary measures, two of which were similar to those identified by the factor analysis (Scholastic Competence – AB and Social Acceptance – SB). The HARTERP factor analysis identified three out of the four of the hypothesized constructs, while the author of the Harter listed four individual summary measures. The similarities were seen in three areas Scholastic Competence – AB,

Social Acceptance – SB, and Behavioral Conduct – EB. Finally, the SNAPTEA listed total of eight summary measures, yet only one of the hypothesized constructs was identified (SB). Therefore, the similarities between the summary measures and possible constructs consisted of only Social Acceptance – SB.

The factor analysis for the Harter assessments resulted in fewer subscales than the SNAP-IV or the Conners. There were between four and nine summary measures for the three Harter assessments. The HARTERA consisted of Scholastic Competence, Social Acceptance, Athletic Competence, Physical Appearance, Job Competence, Romantic Appeal, Behavioral Conduct, Close Friendship, and Global Self-Worth. However, the HARTERP only consisted of Scholastic Competence, Social Acceptance, Athletic Competence, and Behavioral Conduct and the HARTERTA encompassed the same summary measure as the HARTERA with exception to global self-worth. All four of the hypothesized constructs were not evident in each of the Harter assessments. The HARTERA showed evidence of AB and SB. The HARTERP displayed evidence of AB, EB, and SB. The HARTERTA only showed evidence of SB. All of the hypothesized constructs that were identified from the factor analysis could be linked by the items to the summary measures. However, there were additional NIMH summary measures that were not evident in the subscales which resulted from the factor analysis. The items from the DSM-IV criteria for Attention (ADHD) were included within the rating scales summary measures. In addition to the DSM-IV, the SNAP-IV contained items from the Conners Index Questionnaire and the IOWA Conners Questionnaire. Therefore, the SNAP-IV ratings scale not only assessed ADHD but also other behavior and learning disorders. This likely explains why there were additional subscales within this assessment. The number of NIMH summary

measures for the Harter differed among each assessment, and consisted of items such as

Scholastic Competence, Athletic Competence, Social Acceptance, Global Self-Worth, Job

Competence, Romantic Appeal, Behavioral Conduct, Close Friendship, and Physical

Appearance. These differences gave reason for the additional constructs that were seen

within the NIMH summary measures.

Convergent and Discriminant Validity

Adolescent Data

A good construct must have a theoretical basis, which enables researchers to see a

clear definition. The reliability scores among the assessments and subscales had a strong

internal consistency. Most of the assessments displayed strong correlations among their

items (.90 to .70). The reliability scores among the subscales were also within the acceptable

range (.961 to .686).

The multitrait-multimethod matrix (MTMM) analysis for the adolescent data illustrated the

relationship among the Conners, SNAP-IV, and Harter's assessments. Of the four

hypothesized constructs, AB and SB were present in all three assessment groups; EB and IB

were present only in the Conners and SNAP-IV. The resulting validity diagonal correlations

(monotrait-heteromethod), which ranged from .108 to -.045, were poor, indicating a lack of

convergent validity for the constructs. The validity coefficients were not always higher than

the values lying in the column and row within the same heteromethod block. As a result, the

MTMM for the adolescents showed a lack of convergent and discriminant validity.

When comparing the items of the summary measures and the hypothesized

constructs within the adolescent data, there were similarities and difference. Initially, the

assessments had five common constructs: AB, EB, IB, SB, and defiant behavior. It is

important to note that only the Conners and SNAP-IV had EB, IB, and defiant behavior,

which was a possible reason for the varying definitions that existed among the constructs.

The categories within the summary measures of each rating scale had distinct labels that

differed from the construct and therefore might have measured other behaviors other than

the four hypothesized constructs.

Parent Data

The MTMM for parent data was conducted for the three constructs (AB, EB, and

SB) that were common to the three assessments: Conners, SNAP-IV and Harter. The

correlations in the validity diagonals ranged from .027 to -.249, with the highest validity

coefficients occurring for AB and EB between the Conners and the Harter. The validity

coefficients for SB were the poorest. As was the case for the adolescent analysis, the

correlations in the heterotrait-monomethod triangles were the highest of all, indicating

stronger method factors than trait factors. However, the same patterns of trait

interrelationship that confirms evidence for convergent and discriminant validity were not

observed in all triangles.

Similar to adolescent data, parent data had the same issues that affected the results of

the MTMM. The parent common subscales only consisted of three of the hypothesized

constructs (AB, EB, and SB). When comparing the items of the summary measures and the

hypothesized constructs within the adolescent data, there were similarities and differences.

The categories within the summary measures of each rating scale had distinct labels that

differed from the construct and therefore might measure other behaviors other than the four

hypothesized constructs. Moreover, when comparing the rating scales, the summary measures differed not only by the rating scales but within the different stakeholders. The hypothesized constructs were defined using various authors' explanations. The varying definitions used were not identical to those used by the authors of the assessments. There were also overlaps in the summary measures as some items were classified in two categories, yet the factor analysis only allowed the items to fall into one subscale.

<div style="text-align:center">Teacher Data</div>

Teachers play a significant role in a student's life. They spent at least eight hours a day with the student and observe negative behavior not only in the classroom but also in social venues. The CTRS and SNAPTEA had nine summary measures each, while HARTERTA had eight. The factor analysis of the Conners, SNAP-IV, and Harter teacher assessments resulted in one common construct (SB).

The Teacher Correlation MTMM data displayed two traits (AB and EB) and two methods (Conners and SNAP-IV). The reliability scores were consistently the highest correlations within the matrix, ranging from .897 to .958. The validity coefficients were not consistently higher than the values lying in the column and row within the same heteromethod block; however, the validity coefficients were higher than all coefficients in the heterotrait-monomethod triangles. However, the same pattern of trait interrelationship was not observed in all triangles. The teacher results were more encouraging than those from the adolescents and the parent correlations as some of the validity coefficients were higher than the coefficients in the heterotrait-monomethod triangles. This indicates that trait factors were stronger than the methods factors. Although the evidence within the results was slight,

the trait interrelationship was noticeable and might suggest some evidence of convergent validity.

Discussion

The results of the MTMM brought about an investigation that examined why the correlations did not result in convergent or discriminant validity. The outcome of all three MTMMs displayed a discrepancy among the SNAP-IV and Conners' assessments, and there were possible reasons why stronger evidence for these validities did not exist. One explanation for the lack of evidence was the period of time in which the assessments were administered. However, after examining the NIMH MTA PUB database summary, it was concluded that all of the assessments were given within the same period with the exception of CASR, which was given in an earlier period. The explanation could indicate the significant difference among the adolescent assessments, but it did not justify the lack of convergent and discriminant validity in the parent and teacher MTMMs.

The individual who completed the parent questionnaire might have also had an impact on the MTMM results. Although there was a "primary parent" who had the responsibility to rate the students across the three instruments, that person did not always have the same role/label for each adolescent. According to the NIMH MTA PUB, the parent variable consists of a range of persons that might have completed the assessments with a label of "parent" such as Mother, Father, Stepmother, Stepfather, Grandmother, Grandfather, Aunt, Uncle, Sister, Brother, Other Family Member, Foster Mother, Foster Father, Non-family including fiancé, Couple (mother and father figures), Siblings (sisters and

brothers), and Grandparents (grandmother and grandfather). The shifting perspectives from the various respondents could have impacted the results of the MTMM.

The teacher respondent also could have had the same issue. The person who may have responded as a teacher when evaluating a student could have been a Teacher, Language Arts teacher, Math teacher, Social Studies teacher, Special Education teacher, Resource teacher, Homeroom teacher, Other teacher (e.g., science), Language Arts and Math, Language Arts and Social Studies, Math and Social Studies, and Language Arts and Math and Social Studies. Having the teacher's perspective was valuable, but the lack of consistency among the personnel completing these assessments may have had an effect upon the MTMM results.

Next, the phraseology and evaluation of the questions were also taken into consideration. Some of the questions, although encompassing the same constructs, were not comprised of the same language. The four hypothesized constructs were defined using various authors' explanations.

AB refers to the actions or reactions of a child in relation to the educational environment. A few examples of AB were not completing homework, poor performance on tests, and poor class attendance (Jensen, 1986). According to Pinrich and De Groot (1990), there were three general categories of academic tasks: (a) in-class seatwork and homework, (b) quizzes and tests, and (c) essays and reports.

Examples of EB include body language, motor movements, avoidance, stuttering, and disruptions in fluency. This type of behavior may take place any situation or circumstance, especially when the child is interacting with another peer and/or with an adult.

Some examples of extreme EB are hitting, screaming, kicking, destroying property, name

calling, and bullying (Slentz & Krogh, 2001).

Examples of IB include anxiety, withdrawal, and depression. It is common to see

these behaviors in children who were emotional, shy, or even have somatic complaints (Hill

et al., 1998). IB it seems was less often identified, since the manner of conduct was internal

to the person and thus not outwardly expressed. Examples of IB included evading peers, low

or restricted activity levels, or being timid, shy, and withdrawn (Hinshaw et al., 1992).

SB takes place in a social context and results from interaction among individuals

(Farabee, 2000). Some examples of SB for ADHD children were helping, aggression, or the

development of romantic relationships (Malle, 1999). What distinguishes social from non-

social behavior was whether or not a child is capable of comprehending his or her own

actions and taking responsibility for his or her behavior, actions, or practices (Rummel,

1975).

Each of the items within the subscales was analyzed and later labeled based upon this

particular definition. Noticeably, the varying definitions used to label the constructs were not

identical to those used by the authors of the assessments. Some of the items were classified

into more than one summary measure. The factor analysis also resulted in some of the items

being classified into more than one construct; however, with the intention of identifying the

hypothesized factor the items were analyzed to see which subscale was more fitting. These

inconsistencies among the item's definitions and difficulty in classifying the items into the

appropriate construct are plausible reasons for why the correlations did not result in

convergent or discriminant validity. Each of these issues affected the not only the number of

hypothesized constructs that were identified and in return the constructs that could be analyzed by the MTMM.

Classification Agreement

An additional step was taken to examine the clinical relationship between the scores of the Conners and SNAP-IV Adolescent. The cross-tabulation analysis examined the extent of the agreement among the summary measures when assessing the adolescent. A cross-tabulation was performed by calculating the T-score from the raw score that was provided in the original NIMH MTA PUB data. The raw score categories for both ADHD and Hyperactivity within both the CASR and SNAPADOL were analyzed. The results of the cross-tabulation of the ADHD raw scores indicated that 59.7% of the students were classified as ADHD. The cross-tabulation of the hyperactivity raw scores resulted in 62.9% of the students who were classified as hyperactive. Although this figure was not sufficient enough to make a diagnosis of ADHD, it demonstrates that when the two summary measures are compared in a cross-tabulation the agreement is sizeable. The findings of this analysis will also enable the clinician to assess the adolescent and ascertain a more accurate diagnosis. For example, if a clinician was to administer both the SNAP-IV and Conners to a student, he or she would obtain results that would mirror one another when examining the various subscales or summary measures.

Reconciliation

There were common constructs among assessments when organized by stakeholders. Social Behavior, which takes place in a social context and results from the interaction

between and among individuals, was identified in all assessments. Some examples of SB for ADHD children are helping, aggression, or the development of romantic relationships (Malle, 1999). When reviewing the items within the corresponding summary measure scales for SB, the items within the assessments were not always similar. For example the summary measure that corresponded best with SB in the CASR was Anger Control Problems; however, the SB construct for the HARTERA match up with Social Acceptance. Although some of the items in the summary measures were similar to the four hypothesized constructs, each of the assessments used varying definitions of SB.

AB was observed in all the assessments except for the HARTERTA. AB refers to the actions or reactions of a child in relation to the educational environment. The behaviors would be conscious or unconscious, overt or covert, and voluntary or involuntary, and were measured by collecting various forms of data on student performance, such as actual classroom tasks and assignments. A few examples of AB were not completing homework, poor performance on tests, and poor class attendance (Jensen, 1986). AB did not have the same definition for each assessment. For example, the CTRS summary measure that best matched with the SB construct was Conduct Problems, while the SNAPTEA summary measure that had the best fit was Inattention.

Thoughts, feelings, and cognitive-linguistic workings that translate into outer, observable behaviors or external behaviors were seen as EB (Mackesey, 2005). This construct was only evident in the CASR and SNAPADOL. The CPRS summary measure Anxious/Shy was more consistent with IB, yet the SNAPPAR summary measure was ADD/WO. The SNAPTEA summary scale that corresponded with the EB construct was

Hyperactivity and Impulsivity, and the CASR summary measure also had similarities to the

Hyperactivity summary measure.

Finally, IB is explained as behavior shown when a child reacts to internal stimuli, or

an "internal state" (Mackesey, 2005). IB referred to symptoms such as withdrawal,

depression, anxiety, and obsessions/compulsions. These behaviors were evident in all the

parent assessments as well as the CASR and SNAP-IV; however the construct was not as

evident in all assessments.

In sum, the CASR and SNAP-IV had three common constructs (EB, IB, and

Defiant Behavior). All three adolescent assessments had construct similarities in AB and SB.

The parental assessments had three similar constructs (AB, EB, and SB), while teachers had

only two (AB and EB). Table 19 displays the common constructs by stakeholder for all

assessments.

Table 19: Common Constructs by Stakeholder for All Assessments

Stakeholder	Common constructs
Adolescents assessments	External Behavior* Social Behavior Internal Behavior* Defiant Behavior* Academic Behavior
Parents: all 3 assessments	External behavior Social Behavior Academic Behavior
Teachers: all 3 assessments	Social Behavior

*Only common among the Conners and SNAP-IV

As indicated earlier, the results of the MTMM did not show evidence of convergent or discriminant validity. The validity diagonals were not significantly different from zero. The validity coefficients were not always higher than the values lying in the column and row within the same heteromethod block. The validity coefficients were higher than all coefficients in the heterotrait-monomethod triangles. This suggests that the trait factors were stronger than the methods factors. However, the same pattern of trait interrelationship could not be seen in all triangles. The Teacher Correlational MTMM results were the most encouraging; however, the methods and traits were limited to only the Conners and SNAP-IV.

The Hyperactivity Index and ADHD Index were present in both of the Conners and SNAP-IV adolescent assessments. The Hyperactivity and ADHD behaviors displayed by the adolescent not only overlapped, but also might also be difficult to differentiate. The results of the cross-tabulation of the SNAPADOL and CASR ADHD output showed that 59.7% of the responses were in agreement for both of the assessments, and the Hyperactivity output displayed a total of 62.9% of agreement within both of the assessments when observing commonalities in T-scores. The results for the cross-tabulation of each of these indexes illustrated strong correlation among ADHD and Hyperactivity raw scores for the SNAPADOL and CASR. These figures were encouraging for the clinical aspect of these assessments and demonstrated the shared aims among the two assessments.

The constructs' meanings were slightly different when comparing the items from the adolescent, parent, and teacher assessments. For instance, the CASR and SNAPADOL factor analyses both displayed evidence of AB, EB, IB, and SB. Yet only IB and SB constructs were present in both of the assessments' summary measures and factor analysis

constructs' items. This indicated evidence of a variation in the meaning of the constructs when comparing the assessments. An additional example was the comparison of the CTRS and the SNAPTEA. The validity correlations in the MTMM were improved; however, they still were too low to provide firm evidence of convergent validity and not sufficiently different from those in the heteromethod-heterotrait triangles to provide evidence of discriminant validity.

Table 20 below displays the common factor analysis constructs (AB, EB, and SB); however, Hyperactivity was the only summary measure that had the same label and overlapped with EB. The original summary measures were compared to the factor analysis constructs. Although the labeling of the subscales differed, many of the subscale items were similar to the items within the summary measure.

Table 20: Comparison of Summary Measures Factors and Factor Analysis Constructs

Assessment (Column 1)	Summary Measures (Column 2)	Confirmed Hypothesized Factor Analysis Constructs (Column 3)	Items Overlapped (Summary Measure Factors – Factor Analysis Constructs) (Column 4)
CASR	7	4	Emotional Problems – External Behavior Anger Control Problems – Social Behavior Hyperactivity – Internal Behavior
CPRS	9	4	Anxious/Shy – Internal Behavior Restlessness/Disorganized – External Behavior Learning Problem – Academic Behavior
CTRS	9	4	Hyperactivity – External Behavior Conduct Problem – Academic Behavior Anxious/Passive – Internal Behavior Asocial – Social Behavior
HARTERA	9	2	Scholastic Competence – Academic Behavior Social Acceptance – Social Behavior
HARTERP	4	3	Scholastic Competence – Academic Behavior Social Acceptance – Social Behavior Behavioral Conduct – External Behavior
HARTERTA	8	1	Social Acceptance – Social Behavior
SNAPADOL	8	4	Inattention – Academic Behavior Impulsivity – Social Behavior ODD - Internal Behavior
SNAPPAR	8	4	Inattention – Academic Behavior Hyperactivity –Social Behavior Impulsivity – Social Behavior ADD/WO – Internal Behavior ODD – External Behavior
SNAPTEA	8	3	Inattention – Academic Behavior Hyperactivity – External Behavior Impulsivity – External Behavior ODD – Social Behavior

Columns 1 and 2 list the assessments and the number of factors within the summary measures. Column 3 displays the number of hypothesized constructs that were confirmed after the factor analysis. Column 4 displays the overlapping summary measures and hypothesized constructs. If most of the items were present in both the labeled subscales and summary measure, they were jointly listed in the Items Overlapped column. Some of the items within the factor analysis subscales were present within two of the summary measures factors, and therefore the hypothesized constructs were listed twice.

Only two of the assessments contained each of the four hypothesized constructs, the teacher's version of SNAP-IV and Conners. Except for the Harter's teacher and adolescent assessments, the rest of the assessments contained three of the hypothesized constructs, but not the same three in each case.

Conclusions

1. The constructs of AB, EB, IB, and SB existed for all three of the assessments completed by the adolescents.

2. The constructs of AB, EB, and SB existed for all three of the assessments completed by the parents.

3. Only the construct of SB could be verified for the assessments completed by the teachers.

4. SB was the only construct evident in all nine assessments.

5. The constructs within all three MTMMs showed a lack of convergent and discriminant validity.

6. For the assessments completed by the adolescent sample, only moderate

   agreement was evident between the Conners and the SNAP-IV in classifying the

   students as having ADHD and Hyperactivity.

Implications for Assessment of ADHD

The ADHD diagnostic process is complex and extensive. This process not only depends on an all-inclusive physical exam, but also a clear account of the child's academic and family history. Rating scales, caregiver and patient interviews, and physical examinations (including behavioral observation) are all methods for gathering the information necessary for the ADHD diagnostic process. Rating scales alone are not used to diagnose ADHD. There are numerous ADHD rating scales, which examine behavioral and emotional functions of students. Other ADHD rating scales can be used in screening co-morbid disorder, including depression, anxiety, oppositional/conduct problems, and aggression. A number of ADHD rating scales also have a self-assessment and teacher/parent versions, which enables the diagnostician to examine all of the settings in which a student may exhibit the behavior of concern.

A clinician's first step ordinarily entails a medical evaluation in the diagnostic process as this will rule out other possible medical causes for the symptoms. The outside perspective is extremely important when appropriately assessing a student for ADHD. Scales and checklists help clinicians to obtain information from parents, teachers, and others about symptoms and functioning within various settings. The results of the study show that there are common constructs when these assessments are organized by stakeholders.

Monitoring can be another key use of ADHD assessments. Having continuous interviews with teachers and parents can be time consuming; however, periodically assessing the stakeholders allows the clinician to monitor the child's treatment. Therefore having multiple responses from the various stakeholders allows the clinician to also see exactly which behavior (construct) is improving or is in need of improvement.

The triangulation of data from adolescents, parents, and teachers presented interesting findings. Both AB and EB were present in the assessments when analyzing all the stakeholders. Therefore, having all the stakeholders' perspectives on common constructs allows the professional to have a better impression of the student's troublesome behavior.

Although the MTMM did not show evidence of convergent or discriminant validity, the use of more than one assessment could be beneficial. The clinician should keep in mind that when looking at different methods the traits did not have a great amount of similarities. The cross-tabulations examined the responses of the students when observing the ADHD and Hyperactivity Index in the CASR and SNAPADOL. Although this was a small section of the common summary measures, the results show a positive correlation and commonality between the two measures in both assessments. Although the MTMM did not display commonality among the assessments via the matrix, the cross-tabulation did show that the adolescents' responses were similar approximately 60 percent of the time. If this analysis was replicated using other ADHD rating scales, clinicians could use the results of the additional cross-tabulations to examine the relationship among other ADHD assessments. If the cross-tabulation has positive outcomes, clinicians might feel more comfortable using the rating scales in conjunction with one another.

The purpose of using assessments together is to properly diagnose a child and allow researchers to have evidence that supports the diagnosis of ADHD. The results of the study provided another perspective in examining ADHD rating scales that may assist in not only improving psychological assessments but also in developing new ones. Assessments for diagnosing ADHD can be contradictory at times. In addition, many of these assessments are too general and do not focus solely on ADHD. Some professionals believe that assessments are a starting point or provide additional information in aiding with the diagnosis, but are not to be used as a final diagnosis. With further studies such as this, one hopes that researchers will be able to develop a more specialized assessment that can be an accurate form of diagnosis for ADHD.

The results of the study can also be beneficial for specialists, families and other individuals who interact with a child who has ADHD. The initial hypothesis assumed that all of the assessments would be categorized into four behavioral constructs. Although the results did not verify the presence of all four constructs for all ADHD assessments, it is important to note that the multitude of constructs were evident in all nine of the assessments. The difference in the number of constructs identified for each type of assessment signified that although the assessments tested for the same disorder, the manner in which they were assessing the adolescent, parent, or teacher varied. All three stakeholders have different points of view of the troublesome behaviors identified as ADHD and having assessments that are able to pinpoint the constructs/factors that are largely affecting the adolescent's behavior is the key to not only a good diagnosis but also effective treatment. Another benefit of this study is that parents and teachers are able to get the full picture of the adolescent's behavior in all settings.

Suggestions for Further Research

This study introduced many questions that can be researched to a greater extent in the future. In the NIMH MTA study, the Conners, SNAP-IV and Harter's assessments were given to parents, teachers, and adolescents. The results of the factor analysis in this study displayed a number of subscales within nine assessments. Future research could focus on all of the NIMH MTA ADHD assessments used in the NIMH MTA study, such as the Child Depression Inventory, Multidimensional Anxiety Scale for Children, and Self-Reported Antisocial Behavior. All of these assessments are coded as Internalizing/Externalizing Symptomology Assessments according to the NIMH MTA PUB. The research from this study showed that the constructs within the three assessments, taken by an individual stakeholder especially adolescents, are varied and complex. Therefore, the results from a study focusing on only one stakeholder and multiple rating scales may give a more in-depth perspective.

A suggestion for further research would be better identification and definitions of the four behavioral constructs explored in this study. Although some of the assessment summary measures had similar labels, the items within each label were not identical. For this reason, the MTMM's outcome was not encouraging. Developing items and scales by using a common operational definition of the constructs for all assessments should yield stronger evidence for convergent and divergent validity and hence validity for the constructs.

APPENDIX A

NIMH MTA Assessments with Codes

Conners Adolescent Self-Report (Revised) Research Edition

Used by permission of C. Keith Conner, Ph.D.

field 1 = **Participant Identification (ID)**

Note: This variable is not the original study ID number. It has been recoded for
public release.

field 2 = **Days from Baseline (DAYCASR)**

field 3 **= Assessment Point (ASSCASR)** (number of subjects/number of records)

24 = MTA 24 Month Assessment (497/497)

LB = LNCG Baseline Assessment (289/289)

36 = MTA & LNCG 36 Month Assessment (753/753)

72 = MTA & LNCG 72 Month Assessment (696/696)

96 = MTA & LNCG 96 Month Assessment (589/589)

120 = MTA & LNCG 120 Month Assessment (214/214)

field 4 **= Relationship to Child (RELCASR)**

field 5 = **Active Status (ACTCASR)**

> 0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early
>
> Termination from treatment phase; or prior to treatment phase.

field 6 = **Site Identification (SITENUM)**

> Number series range 1 – 6

field 7 = **Subject Type (SJTYP)**

> 1 = MTA Randomized Trial Subject
>
> 2 = Local Normative Comparison Group (LNCG) Subject

Codes for CASR Items 1 through 102 (CA1 – CA102)

> 0 = Not at all true (never, seldom)
>
> 1 = Just a little true (occasionally)
>
> 2 = Pretty much true (often, quite a bit)
>
> 3 = Very much true (very often, very frequent)
>
> . = missing

field 8 = **Item 1**: My mind is pretty sharp **(CA1)**

field 9 = **Item 2**: I have a good head on my shoulders **(CA2)**

field 10 = **Item 3**: I am confident about my abilities **(CA3)**

field 11 = **Item 4**: I like myself **(CA4)**

field 12 = **Item 5**: I have trouble concentrating on one thing at a time **(CA5)**

field 13 = **Item 6**: I have trouble keeping my thoughts organized **(CA6)**

field 14 = **Item 7**: Sticking with things for more than a few minutes is difficult **(CA7)**

field 15 = **Item 8**: I lose track of what I am supposed to do **(CA8)**

field 16 = **Item 9**: I lose my place when I am reading **(CA9)**

field 17 = **Item 10**: Noises tend to put me off the track when I am studying **(CA10)**

field 18 = **Item 11**: I like to be on the go rather than being in one place **(CA11)**

field 19 = **Item 12**: I cannot sit still for very long **(CA12)**

field 20 = **Item 13**: I tend to squirm and fidget **(CA13)**

field 21 = **Item 14**: I have trouble sitting still through a meal **(CA14)**

field 22 = **Item 15**: I have to get up and move around during homework **(CA15)**

field 23 = **Item 16**: I like to play active sports rather than quiet ones **(CA16)**

field 24 = **Item 17**: I feel restless inside even if I am sitting still **(CA17)**

field 25 = **Item 18**: Sometimes I feel like I am driven by a motor **(CA18)**

field 26 = **Item 19**: I have too much energy to sit still for long **(CA19)**

field 27 = **Item 20**: I have difficulty using self-control **(CA20)**

field 28 = **Item 21**: I do things on impulse **(CA21)**

field 29 = **Item 22**: I am easily led into trouble **(CA22)**

field 30 = **Item 23**: When I want something I have trouble stopping myself **(CA23)**

field 31 = **Item 24**: I do not have good judgment about a lot of things **(CA24)**

field 32 = **Item 25**: I have a hot temper **(CA25)**

field 33 = **Item 26**: I tend to explode easily **(CA26)**

field 34 = **Item 27**: A lot of things irritate me **(CA27)**

field 35 = **Item 28**: I am easily set off **(CA28)**

field 36 = **Item 29**: I still throw tantrums **(CA29)**

field 37 = **Item 30**: People bug me and get me angry **(CA30)**

field 38 = **Item 31**: My temper gets me into trouble **(CA31)**

field 39 = **Item 32**: I get into fights **(CA32)**

field 40 = **Item 33**: I take things that do not belong to me **(CA33)**

field 41 = **Item 34**: I break rules **(CA34)**

field 42 = **Item 35**: I destroy property that belongs to others **(CA35)**

field 43 = **Item 36**: I get into trouble with police **(CA36)**

field 44 = **Item 37**: I am truant from school **(CA37)**

field 45 = **Item 38**: I take drugs **(CA38)**

field 46 = **Item 39**: I drink alcoholic beverages **(CA39)**

field 47 = **Item 40**: I like to hurt some people **(CA40)**

field 48 = **Item 41**: I hit people **(CA41)**

field 49 = **Item 42**: I have urges to do really bad things **(CA42)**

field 50 = **Item 43**: I like to do dangerous things **(CA43)**

field 51 = **Item 44**: I bend the rules whenever I can **(CA44)**

field 52 = **Item 45**: I have trouble making and keeping friends **(CA45)**

field 53 = **Item 46**: My friends get fed up with me **(CA46)**

field 54 = **Item 47**: I am a lonely person **(CA47)**

field 55 = **Item 48**: I do not take credit for my accomplishments **(CA48)**

field 56 = **Item 49**: I am not a very good person **(CA49)**

field 57 = **Item 50**: There are a lot of things I dislike about my behavior **(CA50)**

field 58 = **Item 51**: I act okay on the outside, but inside I am unsure of myself **(CA51)**

field 59 = **Item 52**: I wish I were smarter **(CA52)**

field 60 = **Item 53**: I have trouble with reading and spelling **(CA53)**

field 61 = **Item 54**: My handwriting is poor **(CA54)**

field 62 = **Item 55**: It takes a lot of effort to get my schoolwork done **(CA55)**

field 63 = **Item 56**: I tend to learn more slowly than I would like to **(CA56)**

field 64 = **Item 57**: I forget things I have learned **(CA57)**

field 65 = **Item 58**: I have trouble organizing my schoolwork **(CA58)**

field 66 = **Item 59**: I do not like books **(CA59)**

field 67 = **Item 60**: I do not make much effort at my schoolwork **(CA60)**

field 68 = **Item 61**: I am behind in my studies **(CA61)**

field 69 = **Item 62**: I read slowly and with a lot of effort **(CA62)**

field 70 = **Item 63**: I am very disorganized when it comes to homework **(CA63)**

field 71 = **Item 64**: I get nervous **(CA64)**

field 72 = **Item 65**: I feel sad and gloomy **(CA65)**

field 73 = **Item 66**: The future seems hopeless to me **(CA66)**

field 74 = **Item 67**: I feel like killing myself **(CA67)**

field 75 = **Item 68**: A lot of things scare me even if I would not admit it to others **(CA68)**

field 76 = **Item 69**: I have nightmares **(CA69)**

field 77 = **Item 70**: I have a lot of aches and pains **(CA70)**

field 78 = **Item 71**: I worry a lot about little things **(CA71)**

field 79 = **Item 72**: I feel like crying **(CA72)**

field 80 = **Item 73**: I am discouraged **(CA73)**

field 81 = **Item 74**: I am afraid to be alone **(CA74)**

field 82 = **Item 75**: My parents expect too much from me **(CA75)**

field 83 = **Item 76**: It seems like my parents are always criticizing me **(CA76)**

field 84 = **Item 77**: My family does not do many fun things together **(CA77)**

field 85 = **Item 78**: I get away with too much at home **(CA78)**

field 86 = **Item 79**: My parents do not get along very well **(CA79)**

field 87 = **Item 80**: I am not very close to my family **(CA80)**

field 88 = **Item 81**: My parents' discipline is too harsh **(CA81)**

field 89 = **Item 82**: My parents are too strict **(CA82)**

field 90 = **Item 83**: The rules in our house are not very clear **(CA83)**

field 91 = **Item 84**: My parents do not really care about me **(CA84)**

field 92 = **Item 85**: Nobody is really in charge of things in our house **(CA85)**

field 93 = **Item 86**: My parents do not try to keep track of where I am **(CA86)**

field 94 = **Item 87**: There is a lot of yelling in our house **(CA87)**

field 95 = **Item 88**: I come and go as I please in our house **(CA88)**

field 96 = **Item 89**: Punishment in our house is not fair **(CA89)**

field 97 = **Item 90**: Sometimes my parents enforce rules and sometimes they do not **(CA90)**

field 98 = **Item 91**: My parents do not reward or notice my good behavior **(CA91)**

field 99 = **Item 92**: My parents only notice my bad behavior **(CA92)**

field 100 = **Item 93**: I lose my temper **(CA93)**

field 101 = **Item 94**: I argue with my parents or authorities **(CA94)**

field 102 = **Item 95**: I defy requests or rules from parents or others **(CA95)**

field 103 = **Item 96**: I like to annoy my parents or authorities **(CA96)**

field 104 = **Item 97**: I deliberately do things to annoy other people **(CA97)**

field 105 = **Item 98**: I blame others for my mistakes **(CA98)**

field 106 = **Item 99**: I am touchy or easily annoyed **(CA99)**

field 107 = **Item 100**: I am angry and resentful **(CA100)**

field 108 = **Item 101**: I feel that people are unfair to me **(CA101)**

field 109 = **Item 102**: I pout or sulk when I do not get my way **(CA102)**

SUMMARY MEASURES

field 110 = **Factor A Family Problems (mean score) (CAAFAMX)**

field 111 = **Factor A Family Problems (total score) (CAAFAMT)**

> Includes Items 75, 76, 77, 80, 81, 82, 83, 84, 87, 89, 91, 92.

field 112 = **Factor B Emotional Problems (mean score) (CABEMOX)**

field 113 = **Factor B Emotional Problems (total score) (CABEMOT)**

> Includes Items 47, 51, 64, 65, 66, 68, 69, 70, 71, 72, 73, 74.

field 114 = **Factor C Conduct Problems (mean score) (CACCONX)**

field 115 = **Factor C Conduct Problems (total score) (CACCONT)**

> Includes Items 22, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44.

128

field 116 = **Factor D Cognitive Problems/Inattention (mean score) (CADCOGX)**

field 117 = **Factor D Cognitive Problems/Inattention (total score) (CADCOGT)**

Includes Items 5, 6, 7, 8, 9, 53, 55, 56, 57, 58, 62, 63.

field 118 = **Factor E Anger Control Problems (mean score) (CAEANGX)**

field 119 = **Factor E Anger Control Problems (total score) (CAEANGT)**

Includes Items 25, 26, 27, 28, 29, 30, 31, 93.

field 120 = **Factor F Hyperactivity (mean score) (CAFHYPX)**

field 121 = **Factor F Hyperactivity (total score) (CAFHYPT)**

Includes Items 11, 12, 13, 14, 15, 17, 18, 19.

field 122 = **Factor G ADHD Index (mean score) (CAGADHX)**

field 123 = **Factor G ADHD Index (total score) (CAGADHT)**

Includes Items 5, 7, 9, 10, 24, 54, 61, 72, 75, 91, 92, 99.

Note 1: Scoring the summary measures for the 102-Item "Research Edition" CASR

instrument assumed that the data collected on this version of the instrument are comparable

to the norms otherwise obtained with the 120-Item CASS-L version.

Note 2: This 102-item "Research Edition" instrument did not include the 18 items necessary to calculate the following three DSM-IV Symptoms Subscales that are part of the final CASS-L instrument.

Factor H DSM-IV Symptoms Subscales: Inattention

Factor I DSM-IV Symptoms Subscales: Hyperactive-Impulsive

Factor J DSM-IV Symptoms Subscales: Total (Factor H + Factor I)

Conners Parent Rating Scale

Used by permission of C. Keith Conner, Ph.D.

field 1 = **Participant Identification (ID)**

> **Note:** This variable is not the original study ID number. It has been recoded for
>
> public release.

field 2 = **Days from Baseline (DAYSCPRS)**

field 3 **= Assessment Point (ASSCPRS)** (number of subjects/number of records)

  B = MTA Pre-Baseline Screening Assessment (579/579)

  D = MTA Baseline Assessment (562/918)

  03 = MTA 3 Month Assessment (438/687)

  09 = MTA 9 Month Assessment (504/785)

  14 = MTA 14 Month Assessment (519/800)

  E = MTA Early Termination Assessment (18/25)

  24 = MTA 24 Month Assessment (499/761)

  LB = LNCG Baseline Assessment (285/441)

  36 = MTA & LNCG 36 Month Assessment (741/1108)

field 4 = **Relationship to Child (RELCPRS)**

field 5 = **Active Status (ACTCPRS)**

    0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early

        Termination from treatment phase; or prior to treatment phase.

    1 = ACTIVE. Data collected during the 14-month treatment phase while subject

        received originally assignment treatment (regardless of degree of

        compliance).

    2 = ACTIVE. This is the last ACTIVE assessment for subjects who were

        about to violate treatment arm by receiving alternate treatment.

    3 = ACTIVE. This is the last ACTIVE assessment for subjects who were about to

        leave the study by moving away.

field 6 = **Site Identification (SITENUM)**

field 7 = **Subject Type (SJTYP)**

    1 = MTA Randomized Trial Subject

    2 = Local Normative Comparison Group (LNCG) Subject

Codes for CPRS Items 1 through 93 (CP1 - CP93)

    1 = Not at all

    2 = Just a little

    3 = Pretty much

4 = Very much

. = missing

Note: The paper data collection form used codes 0-3; however, these codes were
converted to 1-4 for the database.

field 8 = **Item 1**: Picky and finicky **(CP1)**

field 9 = **Item 2**: Will not eat enough **(CP2)**

field 10 = **Item 3**: Overweight **(CP3)**

field 11 = **Item 4**: Restless **(CP4)**

field 12 = **Item 5**: Nightmares **(CP5)**

field 13 = **Item 6**: Awakens at night **(CP6)**

field 14 = **Item 7**: Cannot fall asleep **(CP7)**

field 15 = **Item 8**: Afraid of new situations **(CP8)**

field 16 = **Item 9**: Afraid of people **(CP9)**

field 17 = **Item 10**: Afraid of being alone **(CP10)**

field 18 = **Item 11**: Worries about illness and death **(CP11)**

field 19 = **Item 12**: Gets stiff and rigid **(CP12)**

field 20 = **Item 13**: Twitches, jerks, etc. **(CP13)**

field 21 = **Item 14**: Shakes **(CP14)**

field 22 = **Item 15**: Stuttering **(CP15)**

field 23 = **Item 16**: Hard to understand **(CP16)**

field 24 = **Item 17**: Bed wetting **(CP17)**

field 25 = **Item 18**: Runs to bathroom constantly **(CP18)**

field 26 = **Item 19**: Soiling self **(CP19)**

field 27 = **Item 20**: Holds back bowel movement **(CP20)**

field 28 = **Item 21**: Headaches **(CP21)**

field 29 = **Item 22**: Stomach aches **(CP22)**

field 30 = **Item 23**: Vomiting **(CP23)**

field 31 = **Item 24**: Aches and pains **(CP24)**

field 32 = **Item 25**: Loose bowels **(CP25)**

field 33 = **Item 26**: Sucks thumb **(CP26)**

field 34 = **Item 27**: Bites or picks nails **(CP27)**

field 35 = **Item 28**: Chews on clothes, blankets, or others **(CP28)**

field 36 = **Item 29**: Picks at things such as hair, clothing, etc. **(CP29)**

field 37 = **Item 30**: Does not act his/her age **(CP30)**

field 38 = **Item 31**: Cries easily **(CP31)**

field 39 = **Item 32**: Wants to help doing things s/he should be doing alone **(CP32)**

field 40 = **Item 33**: Clings to parents or other adults **(CP33)**

field 41 = **Item 34**: Baby talk **(CP34)**

field 42 = **Item 35**: Keeps anger to self **(CP35)**

field 43 = **Item 36**: Lets him/herself get pushed around by other children **(CP36)**

field 44 = **Item 37**: Unhappy **(CP37)**

field 45 = **Item 38**: Carries a chip on his/her shoulder **(CP38)**

field 46 = **Item 39**: Bullying **(CP39)**

field 47 = **Item 40**: Bragging and boasting **(CP40)**

field 48 = **Item 41**: Sassy to grown-ups **(CP41)**

field 49 = **Item 42**: Shy **(CP42)**

field 50 = **Item 43**: Afraid they do not like him/her **(CP43)**

field 51 = **Item 44**: Feelings easily hurt **(CP44)**

field 52 = **Item 45**: Has no friends **(CP45)**

field 53 = **Item 46**: Feels cheated **(CP46) ***

field 54 = **Item 47**: Mean **(CP47) ***

field 55 = **Item 48**: Fights constantly **(CP48) ***

field 56 = **Item 49**: Disturbs other children **(CP49)**

field 57 = **Item 50**: Wants to run things **(CP50)**

field 58 = **Item 51**: Picks on other children **(CP51)**

field 59 = **Item 52**: Restless or overactive **(CP52)**

field 60 = **Item 53**: Excitable, impulsive **(CP53)**

field 61 = **Item 54**: Fails to finish things s/he starts – short attention span **(CP54)**

field 62 = **Item 55**: Temper outbursts, explosive and unpredictable behavior **(CP55)**

field 63 = **Item 56**: Throws him/herself around **(CP56)**

field 64 = **Item 57**: Throws and breaks things **(CP57)**

field 65 = **Item 58**: Pouts and sulks **(CP58)**

field 66 = **Item 59**: Plays with own sex organs **(CP59)**

field 67 = **Item 60**: Involved in sex play with others **(CP60)**

field 68 = **Item 61**: Modest about his/her body **(CP61)**

field 69 = **Item 62**: Is not learning **(CP62)**

field 70 = **Item 63**: Does not like to go to school **(CP63)**

field 71 = **Item 64**: Is afraid to go to school **(CP64)**

field 72 = **Item 65**: Daydreams **(CP65)**

field 73 = **Item 66**: Truancy **(CP66)**

field 74 = **Item 67**: Will not obey school rules **(CP67)**

field 75 = **Item 68**: Denies having done wrong **(CP68)**

field 76 = **Item 69**: Blames others for mistakes **(CP69)**

field 77 = **Item 70**: Tells stories which did not happen **(CP70)**

field 78 = **Item 71**: Stealing form parents **(CP71)**

field 79 = **Item 72**: Stealing at school **(CP72)**

field 80 = **Item 73**: Stealing from stores and other places **(CP73)**

field 81 = **Item 74**: Sets fires **(CP74)**

field 82 = **Item 75**: Gets into trouble with police **(CP75)**

field 83 = **Item 76**: Everything must be just so **(CP76)**

field 84 = **Item 77**: Things must be done same way every time **(CP77)**

field 85 = **Item 78**: Sets goals too high **(CP78)**

field 86 = **Item 79**: Inattentive, easily distracted **(CP79)**

field 87 = **Item 80**: Constantly fidgeting **(CP80)**

field 88 = **Item 81**: Cannot be left alone **(CP81)**

field 89 = **Item 82**: Always climbing **(CP82)**

field 90 = **Item 83**: A very early riser **(CP83)**

field 91 = **Item 84**: Will run around between mouthfuls at meals **(CP84)**

field 92 = **Item 85**: Demands must be met immediately – easily frustrated **(CP85)**

field 93 = **Item 86**: Cannot stand too much excitement **(CP86)**

field 94 = **Item 87**: Laces and zippers are always open **(CP87)**

field 95 = **Item 88**: Cries often and easily **(CP88)**

field 96 = **Item 89**: Unable to stop a repetitive activity **(CP89)**

field 97 = **Item 90**: Acts as if driven by a motor **(CP90)**

field 98 = **Item 91**: Mood changes quickly and drastically **(CP91)**

field 99 = **Item 92**: Poorly aware of surroundings or time of day **(CP92)**

field 100 = **Item 93**: Still cannot tie his/her shoelaces **(CP93)**

> *** Note:** Items 46, 47, and 48 have high numbers of missing data. They occur across
>
> assessment points from all sites. We do not have an explanation for this.

SUMMARY MEASURES

field 101 = **Conduct Problem Factor A (mean score) (CPACDX)**

field 102 = **Conduct Problem Factor A (total score) (CPACDT)**

> Includes Items 30, 32, 39, 40, 41, 43, 46 to 58, 67 to 71.

field 103 = **Anxious-Shy Factor B (mean score) (CPBANXX)**

field 104 = **Anxious-Shy Factor B (total score) (CPBANXT)**

> Includes Items 8 to 12, 31, 33, 42, 43, 44, 46, 63, 64.

field 105 = **Restless-Disorganized Factor C (mean score) (CPCHYFX)**

field 106 = **Restless-Disorganized Factor C (total score) (CPCHYFT)**

> Includes Items 52, 53, 80, 82, 83, 85, 86, 90.

field 107 = **Learning Problem Factor D (mean score) (CPDLRNX)**

field 108 = **Learning Problem Factor D (total score) (CPDLRNT)**

  Includes Items 30, 45, 60, 62, 63, 67.

field 109 = **Psychosomatic Factor E (mean score) (CPEPSX)**

field 110 = **Psychosomatic Factor E (total score) (CPEPST)**

  Includes Items 4, 5, 6, 21 to 25.

field 111 = **Obsessive Compulsive Factor F (mean score) (CPFOCX)**

field 112 = **Obsessive Compulsive Factor F (total score) (CPFOCT)**

  Includes Items 76, 77, 78.

field 113 = **Antisocial Factor G (mean score) (CPGANTIX)**

field 114 = **Antisocial Factor G (total score) (CPGANTIT)**

  Includes Items 68, 71 to 74.

field 115 = **Hyperactive-Immature Factor H (mean score) (CPHYPIMX)**

field 116 = **Hyperactive-Immature Factor H (total score) (CPHYPIMT)**

  Includes Items 1, 4, 12, 13, 14, 18, 27, 28, 29, 31, 32, 33, 36, 44, 52, 53, 54.

field 117 = **Hyperactivity Index (10 items) (mean score) (CPIHYIXX)**

field 118 = **Hyperactivity Index (10 items) (total score) (CPIHYIXT)**

Includes Items 49, 52 to 55, 79, 80, 85, 88, 91.

field 119 = **CPRS Total Score (mean score) (CPTOTALX)**

field 120 = **CPRS Total Score (total score) (CPTOTALT)**

Includes all Items 1 to 93.

<p align="center">**Conners Teachers Rating Scale**</p>

<p align="center">Used by permission of C. Keith Conner, Ph.D.</p>

field 1 = **Participant Identification (ID)**

   Note: This variable is not the original study ID number. It has been recoded for

   public release.

field 2 = **Days from Baseline (DAYCTRS)**

field 3 **= Assessment Point (ASSCTRS)** (number of subjects/number of records)

   B = MTA Pre-Baseline Screening Assessment (579/579)

   D = MTA Baseline Assessment (546/547)

   03 = MTA 3 Month Assessment (225/225)

   09 = MTA 9 Month Assessment (526/527)

   14 = MTA 14 Month Assessment (513/513)

   E = MTA Early Termination Assessment (12/12)

   24 = MTA 24 Month Assessment (486/546)

   LB = LNCG Baseline Assessment (265/303)

   36 = MTA & LNCG 36 Month Assessment (666/1129)

field 4 = **Relationship to Child (RELCTRS)**

field 5 = **Active Status (ACTCTRS)**

> 0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early
>
> > Termination from treatment phase; or prior to treatment phase.
>
> 1 = ACTIVE. Data collected during the 14-month treatment phase while subject
>
> > received originally assignment treatment (regardless of degree of
> >
> > compliance).
>
> 2 = ACTIVE. This is the last ACTIVE assessment for subjects who were about to
>
> > violate treatment arm by receiving alternate treatment.
>
> 3 = ACTIVE. This is the last ACTIVE assessment for subjects who were about to
>
> > leave the study by moving away.

field 6 = **Site Identification (SITENUM)**

> Number series range 1 – 6

Field 7 = **Subject Type (SJTYP)**

> 1 = MTA Randomized Trial Subject
>
> 2 = Local Normative Comparison Group (LNCG) Subject

Codes for CTRS Items 1 through 39 (CT1 – CT39)

> 0 = Not at all
>
> 1 = Just a little

2 = Pretty much

3 = Very much

. = missing

field 8 = **Item 1**: Constantly fidgeting **(CT1)**

field 9 = **Item 2**: Hums and makes other odd noises **(CT2)**

field 10 = **Item 3**: Demands must be met immediately; easily frustrated **(CT3)**

field 11 = **Item 4**: Coordination poor **(CT4)**

field 12 = **Item 5**: Restless or overactive **(CT5)**

field 13 = **Item 6**: Excitable, impulsive **(CT6)**

field 14 = **Item 7**: Inattentive, easily distracted **(CT7)**

field 15 = **Item 8**: Fails to finish things s/he starts; short attention span **(CT8)**

field 16 = **Item 9**: Overly sensitive **(CT9)**

field 17 = **Item 10**: Overly serious or sad **(CT10)**

field 18 = **Item 11**: Daydreams **(CT11)**

field 19 = **Item 12**: Sullen or sulky **(CT12)**

field 20 = **Item 13**: Cries often and easily **(CT13)**

field 21 = **Item 14**: Disturbs other children **(CT14)**

field 22 = **Item 15**: Quarrelsome **(CT15)**

field 23 = **Item 16**: Mood changes quickly and drastically **(CT16)**

field 24 = **Item 17**: Acts "smart" **(CT17)**

field 25 = **Item 18**: Destructive **(CT18)**

field 26 = **Item 19**: Steals **(CT19)**

field 27 = **Item 20**: Lies **(CT20)**

field 28 = **Item 21**: Temper outbursts, explosive and unpredictable behavior **(CT21)**

field 29 = **Item 22**: Isolates him/herself from other children **(CT22)**

field 30 = **Item 23**: Appears to be unaccepted by group **(CT23)**

field 31 = **Item 24**: Appears to be easily led **(CT24)**

field 32 = **Item 25**: No sense of fair play **(CT25)**

field 33 = **Item 26**: Appears to lack leadership **(CT26)**

field 34 = **Item 27**: Does not get along with opposite sex **(CT27)**

field 35 = **Item 28**: Does not get along with same sex **(CT28)**

field 36 = **Item 29**: Teases other children or interferes with their activities **(CT29)**

field 37 = **Item 30**: Submissive **(CT30)**

field 38 = **Item 31**: Defiant **(CT31)**

field 39 = **Item 32**: Impudent **(CT32)**

field 40 = **Item 33**: Shy **(CT33)**

field 41 = **Item 34**: Fearful **(CT34)**

field 42 = **Item 35**: Excessive demands for teacher's attention **(CT35)**

field 43 = **Item 36**: Stubborn **(CT36)**

field 44 = **Item 37**: Overly anxious to please **(CT37)**

field 45 = **Item 38**: Uncooperative **(CT38)**

field 46 = **Item 39**: Attendance problem **(CT39)**

SUMMARY MEASURES

field 47 = **Hyperactivity Factor A (mean score) (CTAHYFX)**

field 48 = **Hyperactivity Factor A (total score) (CTAHYFT)**

     Includes Items 1, 2, 3, 4, 5, 6, 7, 8, 11, 14, 15, 17, 24, 29, 32, 35, 38.

field 49 = **Conduct Problem Factor B (mean score) (CTBCONDX)**

field 50 = **Conduct Problem Factor B (total score) (CTBCONDT)**

     Includes Items 15, 16, 17, 18, 19, 20, 21, 25, 29, 31, 32, 36, 38.

field 51 = **Emotional Overindulgent Factor C (mean score) (CTCEMOX)**

field 52 = **Emotional Overindulgent Factor C (total score) (CTCEMOT)**

     Includes Items 3, 9, 10, 12, 13, 16, 21, 36.

field 53 = **Anxious-Passive Factor D (mean score) (CTDANXX)**

field 54 = **Anxious-Passive Factor D (total score) (CTDANXT)**

     Includes Items 24, 26, 30, 33, 34, 37.

field 55 = **Asocial Factor E (mean score) (CTEASOCX)**

field 56 = **Asocial Factor E (total score) (CTEASOCT)**

     Includes Items 22, 23, 25, 27, 28.

field 57 = **Daydream-Attention Problem Factor F (mean score) (CTFATTNX)**

field 58 = **Daydream-Attention Problem Factor F (total score) (CTFATTNT)**

     Includes Items 8, 11, 22, 39.

field 59 = **Hyperactivity Index (10 items) (mean score) (CTIHYIXX)**

field 60 = **Hyperactivity Index (10 items) (total score) (CTIHYIXT)**

Includes Items 1, 3, 5, 6, 7, 8, 13, 14, 16, 21.

field 61 = **IOWA Inattentive/Overactivity Factor (mean score) (CTIOWAX)**

field 62 = **IOWA Inattentive/Overactivity Factor (total score) (CTIOWAT)**

Includes Items 1, 2, 6, 7, 8.

field 63 = **CTRS Total Score (mean score) (CTTOTALX)**

field 64 = **CTRS Total Score (total score) (CTTOTALT)**

Includes all Items 1 to 39.

<div style="text-align: center">**Harter - Adolescent Version**</div>

<div style="text-align: center">Used by permission of Susan Harter, Ph.D.</div>

field 1 = **Subject Identification (ID)**

> **Note:** This variable is not the original study ID number. It has been recoded for public release.

field 2 = **Days from Baseline (DAYHA)**

field 3 **= Assessment Point (ASSHA)** (number of subjects/number of records)

> 72 = MTA & LNCG 72 Month Assessment (690/690)
>
> 96 = MTA & LNCG 96 Month Assessment (582/582)
>
> 120 = MTA & LNCG 120 Month Assessment (214/214)

field 4 **= Relationship to Child (RELHA)**

field 5 = **Active Status (ACTHA)**

> 0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early Termination from treatment phase; or prior to treatment phase.

field 6 = **Site Identification (SITENUM)**

Number series range 1 – 6

field 7 = **Subject Type (SJTYP)**

1 = MTA Randomized Trial Subject

2 = Local Normative Comparison Group (LNCG) Subject

Codes for HARTERA Items 1 to 45 (HA1 to HA45)

1 = Negative statement is "Really True"

2 = Negative statement is "Sort of True"

3 = Positive statement is "Sort of True"

4 = Positive statement is "Really True"

. = missing

field 8 = **Item 1:**   Some teenagers feel that they are just as smart as others their age (=3

or =4)

BUT

Other teenagers aren't so sure and wonder if they are as smart (=1 or

=2) **(HA1)**

field 9 = **Item 2:**   Some teenagers find it hard to make friends (=1 or =2)

BUT

For other teenagers it's pretty easy (=3 or =4) **(HA2)**

field 10 = **Item 3:**   Some teenagers do very well at all kinds of sports (=3 or =4)

BUT

Other teenagers don't feel that they are very good when it comes to

sports (=1 or =2) **(HA3)**

field 11 = **Item 4:**   Some teenagers are *not* happy with the way they look (=1 or =2)

BUT

Other teenagers *are* happy with the way they look (=3 or =4) **(HA4)**

field 12 = **Item 5:**   Some teenagers feel that they are ready to do well at a part-time job

(=3 or =4)

BUT

Other teenagers feel that they are not quite ready to handle a part-

time job (=1 or =2) **(HA5)**

field 13 = **Item 6:**   Some teenagers feel that if they are romantically interested in

someone, that person will like them back (=3 or =4)

BUT

Other teenagers worry that when they like someone romantically, that

person *won't* like them back (=1 or =2) **(HA6)**

field 14 = **Item 7:**   Some teenagers usually do the right thing (=3 or =4)

BUT

Other teenagers often don't do what they know is right(=1 or =2)

(HA7)

field 15 = **Item 8:**   Some teenagers are able to make really close friends (=3 or =4)

BUT

Other teenagers find it hard to make really close friends (=1 or =2)

(HA8)

field 16 = **Item 9:**   Some teenagers are often disappointed with themselves (=1 or =2)

BUT

Other teenagers are pretty pleased with themselves (=3 or =4)

(HA9)

field 17 = **Item 10:**   Some teenagers are pretty slow in finishing their school work (=1 or =2)

BUT

Other teenagers can do their school work more quickly (=3 or =4)

(HA10)

field 18 = **Item 11:**   Some teenagers have a lot of friends (=3 or =4)

BUT

Other teenagers don't have (=1 or =2) **(HA11)**

field 19 = **Item 12:** Some teenagers think they could do well at just about any new

athletic activity (=3 or =4)

BUT

Other teenagers are afraid they might not do well at a new athletic

activity (=1 or =2) **(HA12)**

field 20 = **Item 13:** Some teenagers wish their body was different (=1 or =2)

BUT

Other teenagers like their body the way it is (=3 or =4) **(HA13)**

field 21 = **Item 14:** Some teenagers feel that they *don't* have enough skills to do well at a

job (=1 or =2)

BUT

Other teenagers feel that they *do* have enough skills to do a job well

(=3 or =4) **(HA14)**

field 22 = **Item 15:** Some teenagers are *not* dating the people they are really attracted to

(=1 or =2)

BUT

Other teenagers are dating those people they are attracted to (=3 or

=4) **(HA15)**

field 23 = **Item 16:** Some teenagers often get in trouble for the things they do (=1 or =2)

BUT

Other teenagers usually *don't* do things that get them in trouble (=3 or =4) **(HA16)**

field 24 = **Item 17:** Some teenagers do have a close friend they can share secrets with (=3 or =4)

BUT

Other teenagers do not have a really close friend they can share secrets with (=1 or =2) **(HA17)**

field 25 = **Item 18:** Some teenagers don't like the way they are leading their life (=1 or =2)

BUT

Other teenagers do like the way they are leading their life (=3 or =4) **(HA18)**

field 26 = **Item 19:** Some teenagers do very well at their class work (=3 or =4)

BUT

Other teenagers don't do very well at their class work (=1 or =2) **(HA19)**

field 27 = **Item 20:** Some teenagers are very hard to like (=1 or =2)

BUT

Other teenagers are really easy to like (=3 or =4) **(HA20)**

field 28 = **Item 21:** Some teenagers feel that they are better than others their age at sports

(=3 or =4)

BUT

Other teenagers don't feel they can play as well (=1 or =2) **(HA21)**

field 29 = **Item 22:** Some teenagers wish their physical appearance was difference (=1 or

=2)

BUT

Other teenagers like their physical appearance the way it is (=3 or =4)

(HA22)

field 30 = **Item 23:** Some teenagers feel they are old enough to get and keep a paying job

(=3 or =4)

BUT

Other teenagers do not feel they are old enough yet to really handle a

job well (=1 or =2) **(HA23)**

field 31 = **Item 24:** Some teenagers feel that people their age will be romantically

attracted to them (=3 or =4)

BUT

Other teenagers worry about whether people their age will be

attracted to them (=1 or =2) **(HA24)**

field 32 = **Item 25:** Some teenagers feel really good about the way they act (=3 or =4)

BUT

Other teenagers *don't* feel that good about the way they often act (=1

or =2) **(HA25)**

field 33 = **Item 26:** Some teenagers wish they had a really close friend to share things

with (=1 or =2)

BUT

Other teenagers *do* have a close friend to share things with (=3 or =4)

(HA26)

field 34 = **Item 27:** Some teenagers are happy with themselves most of the time (=3 or

=4)

BUT

Other teenagers are often not happy with themselves (=1 or =2)

(HA27)

field 35 = **Item 28:** Some teenagers have trouble figuring out the answers in school (=1

or =2)

BUT

153

Other teenagers almost always can figure out the answers (=3 or =4) **(HA28)**

field 36 = **Item 29:** Some teenagers are popular with others their age (=3 or =4)

BUT

Other teenagers are not very popular (=1 or =2) **(HA29)**

field 37 = **Item 30:** Some teenagers don't do well at new outdoor games (=1 or =2)

BUT

Other teenagers are good at new games right away (=3 or =4) **(HA30)**

field 38 = **Item 31:** Some teenagers think that they are good looking (=3 or =4)

BUT

Other teenagers think that they are not very good looking (=1 or =2) **(HA31)**

field 39 = **Item 32:** Some teenagers feel like they could do better at work they do for pay (=1 or =2)

BUT

Other teenagers feel that they are doing really well at work they do for pay (=3 or =4) **(HA32)**

field 40 = **Item 33:** Some teenagers feel that they are fun and interesting on a date (=3 or

=4)

BUT

Other teenagers wonder about how much fun and interesting they

are on a date (=1 or =2) **(HA33)**

field 41 = **Item 34:** Some teenagers do things they know they shouldn't do (=1 or =2)

BUT

Other teenagers hardly ever do things they know they shouldn't do

(=3 or =4) **(HA34)**

field 42 = **Item 35:** Some teenagers find it hard to make friends they can really trust (=1

or =2)

BUT

Other teenagers *are* able to make close friends they can really trust

(=3 or =4) **(HA35)**

field 43 = **Item 36:** Some teenagers like the kind of person they are (=3 or =4)

BUT

Other teenagers often wish they were someone else (=1 or =2)

(HA36)

field 44 = **Item 37:** Some teenagers feel that they are pretty intelligent (=3 or =4)

BUT

Other teenagers question whether they are intelligent (=1 or =2)

(HA37)

field 45 = **Item 38:** Some teenagers feel that they are socially accepted (=3 or =4)

BUT

Other teenagers wished that more people their age accepted them

(=1 or =2) **(HA38)**

field 46 = **Item 39:** Some teenagers do not feel that they are very athletic (=1 or =2)

BUT

Other teenagers feel that they *are* very athletic (=3 or =4) **(HA39)**

field 47 = **Item 40:** Some teenagers really like their looks (=3 or =4)

BUT

Other teenagers wish they looked different (=1 or =2) **(HA40)**

field 48 = **Item 41:** Some teenagers feel that they are really able to handle the work on a

paying job (=3 or =4)

BUT

Other teenagers wonder if they are really doing as good a job at work

as they should be doing (=1 or =2) **(HA41)**

field 49 = **Item 42:**   Some teenagers usually *don't* go out with the people they would really like to date (=1 or =2)

BUT

Other teenagers *do* go out with the people they really want to date (=3 or =4) **(HA42)**

field 50 = **Item 43:**   Some teenagers usually act the way they know they are supposed to (=3 or =4)

BUT

Other teenagers often don't act the way they are supposed to (=1 or =2) **(HA43)**

field 51 = **Item 44**   Some teenagers *don't* have a friend that is close enough to share really personal thoughts with (=1 or =2)

BUT

Other teenagers do have a close friend that they can share personal thoughts and feelings with (=3 or =4) **(HA44)**

field 52 = **Item 45:**   Some teenagers are very happy being the way they are (=3 or =4)

BUT

Other teenagers wish they were different (=1 or =2) **(HA45)**

SUMMARY MEASURES

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Note: Lower scores reflect more negative self-perception.

field 53 = **Scholastic Competence (mean score) (HASCX)**

field 54 = **Scholastic Competence (total score) (HASCT)**

   Includes Items 1, 10, 19, 28, 37.

field 55 = **Social Acceptance (mean score) (HASAX)**

field 56 = **Social Acceptance (total score) (HASAT)**

   Includes Items 2, 11, 20, 29, 38.

field 57 = **Athletic Competence (mean score) (HAACX)**

field 58 = **Athletic Competence (total score) (HAACT)**

   Includes Items 3, 12, 21, 30, 39.

field 59 = **Physical Appearance (mean score) (HAPAX)**

field 60 = **Physical Appearance (total score) (HAPAT)**

   Includes Items 4, 13, 22, 31, 40.

field 61 = **Job Competence (mean score) (HAJCX)**

field 62 = **Job Competence (total score) (HAJCT)**

   Includes Items 5, 14, 23, 32, 41.

field 63 = **Romantic Appeal (mean score) (HARAX)**

field 64 = **Romantic Appeal (total score) (HARAT)**

> Includes Items 6, 15, 24, 33, 42.

field 65 = **Behavioral Conduct (mean score) (HABCX)**

field 66 = **Behavioral Conduct (total score) (HABCT)**

> Includes Items 7, 16, 25, 34, 43.

field 67 = **Close Friendship (mean score) (HACFX)**

field 68 = **Close Friendship (total score) (HACFT)**

> Includes Items 8, 17, 26, 35, 44.

field 69 = **Global Self-Worth (mean score) (HAGSWX)**

field 70 = **Global Self-Worth (total score) (HAGSWT)**

> Includes Items 9, 18, 27, 36, 45.

Harter - Parent Version

Used by permission of Susan Harter, Ph.D.

field 1 = **Participant Identification (ID)**

> **Note:** This variable is not the original study ID number. It has been recoded for
>
> public release.

field 2 = **Days from Baseline (DAYHP)**

field 3 **= Assessment Point (ASSHP)** (number of subjects/number of records)

> 24 = MTA 24 Month Assessment (488/714)
>
> LB = LNCG Baseline Assessment (281/437)
>
> 36 = MTA & LNCG 36 Month Assessment (739/1111)

field 4 **= Relationship to Child (RELHP)**

field 5 = **Active Status (ACTHP)**

> 0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early
>
> Termination from treatment phase; or prior to treatment phase.

field 6 = **Site Identification (SITENUM)**

Number series range 1 – 6

1 = MTA Randomized Trial Subject

2 = Local Normative Comparison Group (LNCG) Subject

Codes for HARTERP Items 1 to 12 (HP1 to HP12)

1 = Negative statement "Really True"

2 = Negative statement "Sort of True"

3 = Positive statement "Sort of True"

4 = Positive statement "Really True"

. = missing

field 8 = **Item 1:**   My child is really good at his/her school work (=3 or =4)

OR

My child can't do the schoolwork assigned (=1 or =2) **(HP1)**

field 9 = **Item 2:**   My child finds it hard to make friends (=1 or =2)

OR

For my child it's pretty easy (=3 or =4) **(HP2)**

field 10 = **Item 3:**   My child does really well at all kinds of sports (=3 or =4)

OR

My child isn't very good when it comes to sports (=1 or =2) **(HP3)**

field 11 = **Item 4:** My child is usually well-behaved (=3 or =4)

OR

My child is often not well behaved (=1 or =2) **(HP4)**

field 12 = **Item 5:** My child often forgets what s/he learns (=1 or =2)

OR

My child can remember things easily (=3 or =4) **(HP5)**

field 13 = **Item 6:** My child has a lot of friends (=3 or =4)

OR

My child doesn't have many friends (=1 or =2) **(HP6)**

field 14 = **Item 7:** My child is better than others his/her age at sports (=3 or =4)

OR

My child can't play as well (=1 or =2) **(HP7)**

field 15 = **Item 8:** My child usually acts appropriately (=3 or =4)

OR

My child would be better if s/he acted differently (=1 or =2) **(HP8)**

field 16 = **Item 9:** My child has trouble figuring out the answers in school (=1 or =2)

OR

My child almost always can figure out the answers (=3 or =4) **(HP9)**

field 17 = **Item 10:** My child is popular with others his/her age (=3 or =4)

OR

My child is not very popular (=1 or =2) **(HP10)**

field 18 = **Item 11:** My child doesn't do well at new outdoor games (=1 or =2)

OR

My child is good at new games right away (=3 or =4) **(HP11)**

field 19 = **Item 12:** My child often gets in trouble because of things he/she does (=1 or =2)

OR

My child usually doesn't do things that get him/her into trouble (=3 or =4) **(HP12)**

SUMMARY MEASURES

NOTE: Lower scores reflect more negative perception.

field 20 = **Scholastic Competence (mean score) (HPSCX)**

field 21 = **Scholastic Competence (total score) (HPSCT)**

Includes Items 1, 5, 9.

field 22 = **Social Acceptance (mean score) (HPSAX)**

field 23 = **Social Acceptance (total score) (HPSAT)**

Includes Items 2, 6, 10.

field 24 = **Athletic Competence (mean score) (HPACX)**

field 25 = **Athletic Competence (total score) (HPACT)**

Includes Items 3, 7, 11.

field 26 = **Behavioral Conduct - (mean score) (HPBCX)**

field 27 = **Behavioral Conduct - (total score) (HPBCT)**

Includes Items 4, 8, 12.

Harter - Teacher of Adolescent Version

Used by permission of Susan Harter, Ph.D.

field 1 = **Subject Identification (ID)**

> **Note:** This variable is not the original study ID number. It has been recoded for public release.

field 2 = **Days from Baseline (DAYHTA)**

field 3 **= Assessment Point (ASSHTA)** (number of subjects/number of records)

> 72 = MTA & LNCG 72 Month Assessment (575/952)
>
> 96 = MTA & LNCG 96 Month Assessment (477/784)
>
> 120 = MTA & LNCG 120 Month Assessment (174/266)

field 4 **= Relationship to Child (RELHTA)**

field 5 = **Active Status (ACTHTA)**

> 0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early Termination from treatment phase; or prior to treatment phase.

field 6 = **Site Identification (SITENUM)**

165

Number series range 1 – 6

field 7 = **Subject Type (SJTYP)**

    1 = MTA Randomized Trial Subject

    2 = Local Normative Comparison Group (LNCG) Subject

Codes for HARTERTA Items 1 to 16 (HTA1 to HTA16)

    1 = Negative statement "Really True"

    2 = Negative statement "Sort of True"

    3 = Positive statement "Sort of True"

    4 = Positive statement "Really True"

    . = missing

field 8 = **Item 1:**   This individual is intelligent (=3 or =4)

        OR

        This individual is not that intelligent (=1 or =2) **(HTA1)**

field 9 = **Item 2:**   This individual does not have a lot of friends (=1 or =2)

        OR

        This individual does have a lot of friends (=3 or =4) **(HTA2)**

field 10 = **Item 3:**   This individual is good at sports (=3 or =4)

        OR

This individual is not that good at sports (=1 or =2) **(HTA3) ***

field 11 = **Item 4:**   This individual has a nice physical appearance (=3 or =4)

OR

This individual does not have such a nice physical appearance (=1 or

=2) **(HTA4) ***

field 12 = **Item 5:**   This individual doesn't do that well at paying jobs (=1 or =2)

OR

This individual does do well at paying jobs (=3 or =4) **(HTA5)**

field 13 = **Item 6:**   This individual is liked by those he/she is romantically interested in

(=3 or =4)

OR

This individual is not that well liked by those he/she is interested in

(=1 or =2) **(HTA6)**

field 14 = **Item 7:**   This individual often doesn't do the right thing (=1 or =2)

OR

This individual usually does do the right thing (=3 or =4) **(HTA7)**

field 15 = **Item 8:**   This individual is able to make close friends (=3 or =4)

OR

This individual finds it hard to make really close friends (=1 or =2)

(HTA8)

field 16 = **Item 9:**   This individual does well at schoolwork (=3 or =4)

OR

This individual doesn't do that well at schoolwork (=1 or =2)

(HTA9)

field 17 = **Item 10:**   This individual is popular (=3 or =4)

OR

This individual is not that popular (=1 or =2) **(HTA10)**

field 18 = **Item 11:**   This individual is not that athletic (=1 or =2)

OR

This individual is athletic (=3 or =4) **(HTA11) ***

field 19 = **Item 12:**   This individual is good looking (=3 or =4)

OR

This individual is not that good looking (=1 or =2) **(HTA12) ***

field 20 = **Item 13:**   This individual does his/her best on paying jobs (=3 or =4)

OR

This individual does not always do his/her best on paying jobs (=1 or =2) **(HTA13)**

field 21 = **Item 14:** This individual is not dating someone he/she is romantically interested in (=1 or =2)

OR

This individual is dating someone he/she is romantically interested in (=3 or =4) **(HTA14)**

field 22 = **Item 15:** This individual usually acts the way he/she is supposed to (=3 or =4)

OR

This individual often doesn't act the way he/she is supposed to (=1 or =2) **(HTA15)**

field 23 = **Item 16:** This individual doesn't have a close friend he/she can really trust (=1 or =2)

OR

This individual does have a close friend he/she can really trust (=3 or =4) **(HTA16)**

SUMMARY MEASURES

Note: Lower scores reflect more negative perception.

field 24 = **Scholastic Competence (mean score) (HTASCX)**

field 25 = **Scholastic Competence (total score) (HTASCT)**

Includes Items 1 and 9.

field 26 = **Social Acceptance (mean score) (HTASAX)**

field 27 = **Social Acceptance (total score) (HTASAT)**

Includes Items 2 and 10.

field 28 = **Athletic Competence (mean score) (HTAACX) ***

field 29 = **Athletic Competence (total score) (HTAACT) ***

Includes Items 3 and 11.

field 30 = **Physical Appearance (mean score) (HTAPAX) ***

field 31 = **Physical Appearance (total score) (HTAPAT) ***

Includes Items 4 and 12.

field 32 = **Job Competence (mean score) (HTAJCX)**

field 33 = **Job Competence (total score) (HTAJCT)**

Includes Items 5 and 13.

field 34 = **Romantic Appeal (mean score) (HTARAX)**

field 35 = **Romantic Appeal (total score) (HTARAT)**

Includes Items 6 and 14.

field 36 = **Behavioral Conduct (mean score) (HTABCX)**

field 37 = **Behavioral Conduct (total score) (HTABCT)**

Includes Items 7 and 15.

field 38 = **Close Friendship (mean score) (HTACFX)**

field 39 = **Close Friendship (total score) (HTACFT)**

Includes Items 8 and 16.

Note: The "Athletic Competence" items 3 and 11 (and thus the Athletic Competence Factor) are missing in many records, where teachers felt unable to rate. The "Physical Appearance" items 4 and 12 (and thus the Physical Appearance Factor) are also missing in many records, where the teacher felt it was inappropriate to rate.

<div align="center">

SNAP-IV – Adolescent Version

Used by permission of James Swanson, Ph.D.

</div>

field 1 = **Subject Identification (ID)**

> **Note:** This variable is not the original study ID number. It has been recoded for
>
> public release.

field 2 = **Days from Baseline (DAYSNAPA)**

field 3 **= Assessment Point (ASSSNAPA)** (number of subjects/number of records)

> 72 = MTA & LNCG 72 Month Assessment (696/696)
>
> 96 = MTA & LNCG 96 Month Assessment (588/588)
>
> 120 = MTA & LNCG 120 Month Assessment (214/214)

field 4 = **Relationship to Child (RELSNAPA)**

field 5 = **Active Status (ACTSNAPA)**

> 0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early
>
> Termination from treatment phase; or prior to treatment phase.

field 6 = **Site Identification (SITENUM)**

Number series range 1 – 6

field 7 = **Subject Type (SJTYP)**

1 = MTA Randomized Trial Subject

2 = Local Normative Comparison Group (LNCG) Subject

Codes for SNAPADOL Items 1 through 39 (SNA1-SNC39)

0 = Not at all

1 = Just a little

2 = Pretty much

3 = Very much

. = missing

field 8 = **Item 1:** Failed to give close attention to details or made careless mistakes in

schoolwork, work, or other activities **(SNA1)**

field 9 = **Item 2:** Had difficulty sustaining attention in tasks or play activities **(SNA2)**

field 10 = **Item 3:** Did not seem to listen to what was being said **(SNA3)**

field 11 = **Item 4:** Did not follow through on instructions and failed to finish schoolwork,

chores, or duties in the workplace **(SNA4)**

field 12 = **Item 5:** Had difficulty organizing tasks and activities **(SNA5)**

field 13 = **Item 6:** Avoided, expressed reluctance about, or had difficulties engaging in tasks

that required sustained mental effort (such as schoolwork or homework) **(SNA6)**

field 14 = **Item 7:** Lost things necessary for tasks or activities (e.g., school assignments, pencils, books, tools, or toys) **(SNA7)**

field 15 = **Item 8:** Were easily distracted by extraneous stimuli **(SNA8)**

field 16 = **Item 9:** Were forgetful in daily activities **(SNA9)**

field 17 = **Item 10:** Fidgeted with your hands or feet or squirmed in your seat **(SNA10)**

field 18 = **Item 11:** Left seat in classroom or in other situations in which remaining seated was expected **(SNA11)**

field 19 = **Item 12:** Ran about or climbed excessively in situations where it was inappropriate (may be limited to feelings of restlessness) **(SNA12)**

field 20 = **Item 13:** Had difficulty playing or engaging in leisure activities quietly **(SNA13)**

field 21 = **Item 14:** Were always "on the go" or acted as if "driven by a motor" **(SNA14)**

field 22 = **Item 15:** Talked excessively **(SNA15)**

field 23 = **Item 16:** Blurted out answers to questions before the questions had been completed **(SNA16)**

field 24 = **Item 17:** Had difficulty waiting in lines or awaiting turn in games or group situations **(SNA17)**

field 25 = **Item 18:** Interrupted or intruded on others (e.g., butted into other's conversations or games) **(SNA18)**

field 26 = **Item 19:** Stared into space and reported daydreaming **(SNA19)**

field 27 = **Item 20:** Were low in energy level, sluggish, or drowsy **(SNA20)**

field 28 = **Item 21:** Were apathetic or unmotivated to engage in goal-directed activities **(SNA21)**

field 29 = **Item 22:** Engaged in physically dangerous activities without considering possible

consequences **(SNA22)**

field 30 = **Item 23:** Shifted from one uncompleted activity to another **(SNA23)**

field 31 = **Item 24:** Failed to finish projects **(SNA24)**

field 32 = **Item 25:** Had difficulty concentrating on school work or other tasks requiring

sustained attention **(SNA25)**

field 33 = **Item 26:** Had difficulty sticking to a play activity **(SNA26)**

field 34 = **Item 27:** Called out in class or in other situations when silence was expected

(SNA27)

field 35 = **Item 28:** Needed a lot of supervision **(SNA28)**

field 36 = **Item 29:** Moved about excessively (e.g., even during sleep at home or during quiet

time at school) **(SNA29)**

field 37 = **Item 30:** Acted before thinking **(SNA30)**

field 38 = **Item 31:** Lost temper **(SNA31)**

field 39 = **Item 32:** Argued with adults **(SNA32)**

field 40 = **Item 33:** Actively defied or refused adult requests or rules **(SNA33)**

field 41 = **Item 34:** Did things deliberately that annoy other people **(SNA34)**

field 42 = **Item 35:** Blamed others for your mistakes or misbehavior **(SNA35)**

field 43 = **Item 36:** Were touchy or easily annoyed by others **(SNA36)**

field 44 = **Item 37:** Were angry and resentful **(SNA37)**

field 45 = **Item 38:** Were spiteful or vindictive **(SNA38)**

field 46 = **Item 39:** Swore or used obscene language **(SNA39)**

SUMMARY MEASURES

field 47 = **Inattention (mean score) (SNAINATX)**

field 48 = **Inattention (total score) (SNAINATT)**

> Includes Items 1 to 9.

field 49 = **Hyperactivity (mean score) (SNAHYPAX)**

field 50 = **Hyperactivity (total score) (SNAHYPAT)**

> Includes Items 10 to 15.

field 51 = **Impulsivity (mean score) (SNAIMPUX)**

field 52 = **Impulsivity (total score) (SNAIMPUT)**

> Includes Items 16, 17, 18.

field 53 = **ADD/WO (mean score) (SNAADDWX)**

field 54 = **ADD/WO (total score) (SNAADDWT)**

> Includes Items 1 to 5, 7, 9, 19, 20, 21.

field 55 = **ODD (mean score) (SNAODDX)**

field 56 = **ODD (total score) (SNAODDT)**

> Includes Items 31 to 38.

field 57 = **SNAP-Adolescent Total Score (mean score) (SNATOTLX)**

field 58 = **SNAP-Adolescent Total Score (total score) (SNATOTLT)**

      Includes all Items 1 to 39.

field 59 = **SNAP-Adolescent Hyperactive/Impulsive (mean score) (SNAHYIMX)**

      This is the mean of field 50 **(SNAHYPAX)** and field 52 **(SNAIMPUX)**

      weighted equally.

    Note: This composite variable is scored even if only one of the above means is

present. See field 63 (SNAHIX) below for variable using same items, but unit

weighted, and with the 80% rule for data present. It should be noted that the two

variables (SNAHYIMX and SNTHIX) yield different results due to differences in

weighting of items.

field 60 = **ADHD (mean score) (SNAADHDX)**

field 61 = **ADHD (total score) (SNAADHDT)**

      Includes Items 1 to 18.

field 62 = **Hyperactive/Impulsive (mean score) (SNAHIX)**

field 63 = **Hyperactive/Impulsive (total score) (SNAHIT)**

      Includes Items 10 to 18.

    Note: SNAP "<u>Adolescent</u> Composite DBD Mean" and SNAP "<u>Adolescent</u>

Excellent Responder" Scores are contained in this file. Counterpart Parent and

Teacher items (SNAP "Parent or Teacher Composite DBD Mean" and SNAP

"Parent or Teacher Excellent Responder" Scores) are contained in the files

SNAPPAR and SNAPTEA. However, the variables used as outcome measures are

the combination of both the Parent and Teacher ratings (not Adolescent ratings

which were unavailable at that time). These variables, SNAP "Parent and Teacher

Composite DBD Mean" and SNAP "Parent and Teacher Excellent Responder"

Scores are found in the file COMPVARS.

field 64 = **SNAP "Adolescent Composite DBD Mean" Score (SNADBDX)**

Note: "Disruptive Behavior Disorder" used in variable name, although not a DSM-

IV term.

This score uses the following 26 items:

9 Adolescent SNAP ADHD Inattention items (1-9)

9 Adolescent SNAP ADHD Hyperactive/Impulsive items (10-18)

8 Adolescent SNAP ODD items (31-38)

Note: The mean score is calculated as follows. The separate mean calculated for

each component above (SNAINATX, SNAHIX, SNAODDX) is based on the items

present in that component (80% of the items must be present in order to calculate

that component's mean). The mean of the three means is then calculated, weighting

the Inattention component by 9, the Hyper/Impulsive by 9, and the ODD by 8, and

then dividing by 26. If the mean of any of the three components cannot be calculated due to missing data, the entire mean is NOT calculated.

field 65 = **SNAP "Adolescent Excellent Responder" Score (SNAXRSP)**

1 = "SNAP Adolescent Composite DBD Mean Score (SNADBDX)" LE 1.0 = Responder

0 = "SNAP Adolescent Composite DBD Mean Score (SNADBDX)" GT 1.0 = Non-Responder

SNAP-IV – Parent Version

Used by permission of James Swanson, Ph.D.

field 1 = **Participant Identification (ID)**

> **Note:** This variable is not the original study ID number. It has been recoded for public release.

field 2 = **Days from Baseline (DAYSNAP)**

field 3 **= Assessment Point (ASSSNAP)** (number of subjects/number of records)

> B = MTA Pre-Baseline Screening Assessment (578/578)
>
> D = MTA Baseline Assessment (562/918)
>
> 03 = MTA 3 Month Assessment (438/687)
>
> 09 = MTA 9 Month Assessment (505/786)
>
> 14 = MTA 14 Month Assessment (519/798)
>
> E = MTA Early Termination Assessment (18/25)
>
> 24 = MTA 24 Month Assessment (500/761)
>
> LB = LNCG Baseline Assessment (285/443)
>
> 36 = MTA & LNCG 36 Month Assessment (743/1116)
>
> 72 = MTA & LNCG 72 Month Assessment (699/968)

180

96 = MTA & LNCG 96 Month Assessment (593/824)

120 = MTA & LNCG 120 Month Assessment (215/298)

field 4 = **Relationship to Child (RELSNAP)**

field 5 = **Active Status (ACTSNAP)**

0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early Termination from treatment phase; or prior to treatment phase.

1 = ACTIVE. Data collected during the 14-month treatment phase while subject received originally assignment treatment (regardless of degree of compliance).

2 = ACTIVE. This is the last ACTIVE assessment for subjects who were about to violate treatment arm by receiving alternate treatment.

3 = ACTIVE. This is the last ACTIVE assessment for subjects who were about to leave the study by moving away.

field 6 = **Site Identification (SITENUM)**

Number series range 1 – 6

field 7 = **Subject Type (SJTYP)**

1 = MTA Randomized Trial Subject

2 = Local Normative Comparison Group (LNCG) Subject

Codes for SNAPPAR Items 1 through 39 (SN1 - SN39)

0 = Not at all

1 = Just a little

2 = Pretty much

3 = Very much

. = missing

field 8 = **Item 1:** Fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities **(SN1)**

field 9 = **Item 2:** Has difficulty sustaining attention in tasks or play activities **(SN2)**

field 10 = **Item 3:** Does not seem to listen to what is being said to him or her **(SN3)**

field 11 = **Item 4:** Does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions) **(SN4)**

field 12 = **Item 5:** Has difficulty organizing tasks and activities **(SN5)**

field 13 = **Item 6:** Avoids, expresses reluctance about, or has difficulties engaging in tasks that require sustained mental effort (such as schoolwork or homework) **(SN6)**

field 14 = **Item 7:** Loses things necessary for tasks or activities (e.g., school assignments, pencils, books, tools, or toys) **(SN7)**

field 15 = **Item 8:** Is easily distracted by extraneous stimuli **(SN8)**

field 16 = **Item 9:** Is forgetful in daily activities **(SN9)**

field 17 = **Item 10:** Fidgets with hands or feet or squirms in seat **(SN10)**

field 18 = **Item 11:** Leaves seat in classroom or in other situations in which remaining seated is expected **(SN11)**

field 19 = **Item 12:** Runs about or climbs excessively in situations where it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness) **(SN12)**

field 20 = **Item 13:** Has difficulty playing or engaging in leisure activities quietly **(SN13)**

field 21 = **Item 14:** Is always "on the go" or acts as if "driven by a motor" **(SN14)**

field 22 = **Item 15:** Talks excessively **(SN15)**

field 23 = **Item 16:** Blurts out answers to questions before the questions have been completed **(SN16)**

field 24 = **Item 17:** Has difficulty waiting in lines or awaiting turn in games or group situations **(SN17)**

field 25 = **Item 18:** Interrupts or intrudes on others (e.g., butts into other's conversations or games) **(SN18)**

field 26 = **Item 19:** Stares into space and reports daydreaming **(SN19)**

field 27 = **Item 20:** Appears to be low in energy level, sluggish, or drowsy **(SN20)**

field 28 = **Item 21:** Appears to be apathetic or unmotivated to engage in goal directed activities **(SN21)**

field 29 = **Item 22:** Engages in physically dangerous activities without considering possible consequences **(SN22)**

field 30 = **Item 23:** Shifts from one uncompleted activity to another **(SN23)**

field 31 = **Item 24:** Fails to finish things he or she starts **(SN24)**

field 32 = **Item 25:** Has difficulty concentrating on school work or other tasks requiring sustained attention **(SN25)**

field 33 = **Item 26:** Has difficulty sticking to a play activity **(SN26)**

field 34 = **Item 27:** Calls out in class or in other situations when silence is expected **(SN27)**

field 35 = **Item 28:** Needs a lot of supervision **(SN28)**

field 36 = **Item 29:** Moves about excessively (e.g., even during sleep at home or during quiet

time at school) **(SN29)**

field 37 = **Item 30:** Acts before thinking **(SN30)**

field 38 = **Item 31:** Loses temper **(SN31)**

field 39 = **Item 32:** Argues with adults **(SN32)**

field 40 = **Item 33:** Actively defies or refuses adult requests or rules **(SN33)**

field 41 = **Item 34:** Does things deliberately that annoy other people **(SN34)**

field 42 = **Item 35:** Blames others for his or her mistakes or misbehavior **(SN35)**

field 43 = **Item 36:** Is touchy or easily annoyed by others **(SN36)**

field 44 = **Item 37:** Is angry and resentful **(SN37)**

field 45 = **Item 38:** Is spiteful or vindictive **(SN38)**

field 46 = **Item 39:** Swears or uses obscene language **(SN39)**

SUMMARY MEASURES

field 47 = **Inattention (mean score) (SNINATTX)**

field 48 = **Inattention (total score) (SNINATTT)**

Includes Items 1 to 9.

field 49 = **Hyperactivity (mean score) (SNHYPACX)**

field 50 = **Hyperactivity (total score) (SNHYPACT)**

> Includes Items 10 to 15.

field 51 = **Impulsivity (mean score) (SNIMPULX)**

field 52 = **Impulsivity (total score) (SNIMPULT)**

> Includes Items 16, 17, 18.

field 53 = **ADD/WO (mean score) (SNADDWOX)**

field 54 = **ADD/WO (total score) (SNADDWOT)**

> Includes Items 1 to 5, 7, 9, 19, 20, 21.

field 55 = **ODD (mean score) (SNODDX)**

field 56 = **ODD (total score) (SNODDT)**

> Includes Items 31 to 38.

field 57 = **SNAP-Parent Total Score (mean score) (SNTOTALX)**

field 58 = **SNAP-Parent Total Score (total score) (SNTOTALT)**

> Includes all Items 1 to 39.

field 59 = **SNAP-Parent Hyperactive/Impulsive (mean score) (SNPHYIMX)**

> This is the mean of field 50 **(SNHYPACX)** and field 52 **(SNIMPULX)**
>
> <u>weighted equally</u>. (This composite variable was used as a major dependent
>
> outcome variable.)

Note: This composite variable is scored even if only one of the above means is present. See field 62 (SNHIX) below for variable using same items, but unit weighted, and with the 80% rule for data present. It should be noted that the two variables (SNPHYIMX and SNHIX) yield different results due to differences in weighting of items.

field 60 = **ADHD (mean score) (SNADHDX)**

field 61 = **ADHD (total score) (SNADHDT)**

       Includes Items 1 to 18.

field 62 = **Hyperactive/Impulsive (mean score) (SNHIX)**

field 63 = **Hyperactive/Impulsive (total score) (SNHIT)**

       Includes Items 10 to 18.

Note: SNAP "Parent Composite DBD Mean" and SNAP "Parent Excellent Responder" Scores are contained in this file. Counterpart Teacher items (SNAP "Teacher Composite DBD Mean" and SNAP "Teacher Excellent Responder" Scores) are contained in the file SNAPTEA. However, the variables used as outcome measures are the combination of both the Parent and Teacher ratings. These variables, SNAP "Parent and Teacher Composite DBD Mean" and SNAP "Parent and Teacher Excellent Responder" Scores are found in the file COMPVARS.

field 64 = **SNAP "Parent Composite DBD Mean" Score (SNDBDX)**

Note: "Disruptive Behavior Disorder" used in variable name, although not a DSM-IV term.

This score uses the following 26 items:

9 Parent SNAP ADHD Inattention items (1-9)

9 Parent SNAP ADHD Hyperactive/Impulsive items (10-18)

8 Parent SNAP ODD items (31-38)

Note: The mean score is calculated as follows. The separate mean calculated for each component above (SNINATTX, SNHIX, SNODDX) is based on the items present in that component (80% of the items must be present in order to calculate that component's mean). The mean of the three means is then calculated, weighting the Inattention component by 9, the Hyper/Impulsive by 9, and the ODD by 8, and then dividing by 26. If the mean of any of the three components cannot be calculated due to missing data, the entire mean is NOT calculated.

field 65 = **SNAP "Parent Excellent Responder" Score (SNXRSP)**

1 = "SNAP Parent Composite DBD Mean Score (SNDBDX)" LE 1.0 = Responder

0 = "SNAP Parent Composite DBD Mean Score (SNDBDX)" GT 1.0 = Non-Responder

SNAP-IV – Teacher Version

field 1 = **Participant Identification (ID)**

    Note: This variable is not the original study ID number. It has been recoded for

    public release.

field 2 = **Days from Baseline (DAYSNAPT)**

field 3 **= Assessment Point (ASSSNAPT)** (number of subjects/number of records)

    B = MTA Pre-Baseline Screening Assessment (577/577)

    D = MTA Baseline Assessment (545/546)

    03 = MTA 3 Month Assessment (224/224)

    09 = MTA 9 Month Assessment (526/527)

    14 = MTA 14 Month Assessment (509/509)

    E = MTA Early Termination Assessment (12/12)

    24 = MTA 24 Month Assessment (486/546)

    LB = LNCG Baseline Assessment (265/303)

    36 = MTA & LNCG 36 Month Assessment (667/1129)

    72 = MTA & LNCG 72 Month Assessment (574/948)

96 = MTA & LNCG 96 Month Assessment (477/784)

120 = MTA & LNCG 120 Month Assessment (174/266)

field 4 = **Relationship to Child (SNTEACH)**

field 5 = **Active Status (ACTSNAPT)**

    0 = INACTIVE. Data collected after the 14-month treatment phase; or after Early

        Termination from treatment phase; or prior to treatment phase.

    1 = ACTIVE. Data collected during the 14-month treatment phase while subject

        received originally assignment treatment (regardless of degree of

        compliance).

    2 = ACTIVE. This is the last ACTIVE assessment for subjects who were about to

        violate treatment arm by receiving alternate treatment.

    3 = ACTIVE. This is the last ACTIVE assessment for subjects who were about to

        leave the study by moving away.

field 6 = **Site Identification (SITENUM)**

    Number series range 1 – 6

field 7 = **Subject Type (SJTYP)**

    1 = MTA Randomized Trial Subject

    2 = Local Normative Comparison Group (LNCG) Subject

Codes for SNAPTEA Items 1 through 39 (SNT1-SNT39)

0 = Not at all

1 = Just a little

2 = Pretty much

3 = Very much

. = missing

field 8 = **Item 1:** Fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities **(SNT1)**

field 9 = **Item 2:** Has difficulty sustaining attention in tasks or play activities **(SNT2)**

field 10 = **Item 3:** Does not seem to listen to what is being said to him or her **(SNT3)**

field 11 = **Item 4:** Does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions) **(SNT4)**

field 12 = **Item 5:** Has difficulty organizing tasks and activities **(SNT5)**

field 13 = **Item 6:** Avoids, expresses reluctance about, or has difficulties engaging in tasks that require sustained mental effort (such as schoolwork or homework) **(SNT6)**

field 14 = **Item 7:** Loses things necessary for tasks or activities (e.g., school assignments, pencils, books, tools, or toys) **(SNT7)**

field 15 = **Item 8:** Is easily distracted by extraneous stimuli **(SNT8)**

field 16 = **Item 9:** Is forgetful in daily activities **(SNT9)**

field 17 = **Item 10:** Fidgets with hands or feet or squirms in seat **(SNT10)**

field 18 = **Item 11:** Leaves seat in classroom or in other situations in which remaining seated is expected **(SNT11)**

field 19 = **Item 12:** Runs about or climbs excessively in situations where it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness) **(SNT12)**

field 20 = **Item 13:** Has difficulty playing or engaging in leisure activities quietly **(SNT13)**

field 21 = **Item 14:** Is always "on the go" or acts as if "driven by a motor" **(SNT14)**

field 22 = **Item 15:** Talks excessively **(SNT15)**

field 23 = **Item 16:** Blurts out answers to questions before the questions have been completed **(SNT16)**

field 24 = **Item 17:** Has difficulty waiting in lines or awaiting turn in games or group situations **(SNT17)**

field 25 = **Item 18:** Interrupts or intrudes on others (e.g., butts into other's conversations or games) **(SNT18)**

field 26 = **Item 19:** Stares into space and reports daydreaming **(SNT19)**

field 27 = **Item 20:** Appears to be low in energy level, sluggish, or drowsy **(SNT20)**

field 28 = **Item 21:** Appears to be apathetic or unmotivated to engage in goal directed activities **(SNT21)**

field 29 = **Item 22:** Engages in physically dangerous activities without considering possible consequences **(SNT22)**

field 30 = **Item 23:** Shifts from one uncompleted activity to another **(SNT23)**

field 31 = **Item 24:** Fails to finish things he or she starts **(SNT24)**

field 32 = **Item 25:** Has difficulty concentrating on school work or other tasks requiring sustained attention **(SNT25)**

field 33 = **Item 26:** Has difficulty sticking to a play activity **(SNT26)**

field 34 = **Item 27:** Calls out in class or in other situations when silence is expected

(SNT27)

field 35 = **Item 28:** Needs a lot of supervision **(SNT28)**

field 36 = **Item 29:** Moves about excessively (e.g., even during sleep at home or during quiet

time at school) **(SNT29)**

field 37 = **Item 30:** Acts before thinking **(SNT30)**

field 38 = **Item 31:** Loses temper **(SNT31)**

field 39 = **Item 32:** Argues with adults **(SNT32)**

field 40 = **Item 33:** Actively defies or refuses adult requests or rules **(SNT33)**

field 41 = **Item 34:** Does things to deliberately annoy other people **(SNT34)**

field 42 = **Item 35:** Blames others for his or her mistakes or misbehavior **(SNT35)**

field 43 = **Item 36:** Is touchy or easily annoyed by others **(SNT36)**

field 44 = **Item 37:** Is angry and resentful **(SNT37)**

field 45 = **Item 38:** Is spiteful or vindictive **(SNT38)**

field 46 = **Item 39:** Swears or uses obscene language **(SNT39)**

SUMMARY MEASURES

field 47 = **Inattention (mean score) (SNTINATX)**

field 48 = **Inattention (total score) (SNTINATT)**

       Includes Items 1 to 9.

field 49 = **Hyperactivity (mean score) (SNTHYPAX)**

field 50 = **Hyperactivity (total score) (SNTHYPAT)**

      Includes Items 10 to 15.

field 51 = **Impulsivity (mean score) (SNTIMPUX)**

field 52 = **Impulsivity (total score) (SNTIMPUT)**

      Includes Items 16, 17, 18.

field 53 = **ADD/WO (mean score) (SNTADDWX)**

field 54 = **ADD/WO (total score) (SNTADDWT)**

      Includes Items 1 to 5, 7, 9, 19, 20, 21.

field 55 = **ODD (mean score) (SNTODDX)**

field 56 = **ODD (total score) (SNTODDT)**

      Includes Items 31 to 38.

field 57 = **SNAP-Teacher Total Score (mean score) (SNTTOTLX)**

field 58 = **SNAP-Teacher Total Score (total score) (SNTTOTLT)**

      Includes all Items 1 to 39.

field 59 = **SNAP-Teacher Hyperactive/Impulsive (mean score) (SNTHYIMX)**

This is the mean of field 50 **(SNTHYPAX)** and field 52 **(SNTIMPUX)** weighted

equally. (This composite variable was used as a major dependent outcome variable.)

Note: This composite variable is scored even if only one of the above means is present. See field 62 (SNTHIX) below for variable using same items, but unit weighted, and with the 80% rule for data present. It should be noted that the two variables (SNTHYIMX and SNTHIX) yield different results due to differences in weighting of items.

field 60 = **ADHD (mean score) (SNTADHDX)**

field 61 = **ADHD (total score) (SNTADHDT)**

> Includes Items 1 to 18.

field 62 = **Hyperactive/Impulsive (mean score) (SNTHIX)**

field 63 = **Hyperactive/Impulsive (total score) (SNTHIT)**

> Includes Items 10 to 18.

Note: SNAP "Teacher Composite DBD Mean" and SNAP "Teacher Excellent Responder" Scores are contained in this file. Counterpart Parent items (SNAP "Parent Composite DBD Mean" and SNAP "Parent Excellent Responder" Scores) are contained in the file SNAPPAR. However, the variables used as outcome measures are the combination of both the Parent and Teacher ratings. These variables, SNAP "Parent and Teacher Composite DBD Mean" and SNAP "Parent and Teacher Excellent Responder" Scores are found in the file COMPVARS.

field 64 = **SNAP "Teacher Composite DBD Mean" Score (SNTDBDX)**

> **Note:** "<u>D</u>isruptive <u>B</u>ehavior <u>D</u>isorder" used in variable name, although not a DSM-IV term.

This score uses the following 26 items:

> 9 Teacher SNAP ADHD Inattention items (1-9)
>
> 9 Teacher SNAP ADHD Hyperactive/Impulsive items (10-18)
>
> 8 Teacher SNAP ODD items (31-38)

> **Note:** The mean score is calculated as follows. The separate mean calculated for each component above (SNTINATX, SNTHIX, SNTODDX) is based on the items present in that component (80% of the items must be present in order to calculate that component's mean). The mean of the three means is then calculated, weighting the Inattention component by 9, the Hyper/Impulsive by 9, and the ODD by 8, and then dividing by 26. If the mean of any of the three components cannot be calculated due to missing data, the entire mean is NOT calculated.

field 65 = **SNAP "Teacher Excellent Responder" Score (SNTXRSP)**

> 1 = "SNAP Teacher Composite DBD Mean Score (SNTDBDX)" LE 1.0 = Responder
>
> 0 = "SNAP Teacher Composite DBD Mean Score (SNTDBDX)" GT 1.0 = Non-Responder

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