UTILITY OF THE YSR AND AARS IN DISCRIMINATING AGGRESSIVE VERSUS NON-AGGRESSIVE ADOLESCENTS IN AN INPATIENT SAMPLE

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CHAPTER I

INTRODUCTION

Children and Adolescents are more frequently being placed in psychiatric hospitals or residential treatment facilities, often for aggressive behavior. Little research has been conducted on this population (Day, Franklin, & Marshall, 1998).

In psychiatrically referred youth, aggressive behavior has shown a noticeable increase in the past two decades. Base rates of 15-30% of psychiatric patients committing physical assault while in the hospital are commonly reported (Bjorkly, 1995). These prevalence rates significantly raise the overall cost of child and adolescent mental health services (Connor, 1998).

The management of inpatient aggression has become apparent as a primary therapeutic concern from two perspectives: the impact of violence on patient progress (both the individual and the other patients on the unit) and the consequences of staff victimization (such as injuries) (Day, Franklin, & Marshall, 1998; Merckelbach, Evers, Palmstierna, & Campo 2002).

Since a subset of hospitalized adolescents have a tendency to behave in an antisocial and rebellious way, resulting into disruption of the therapeutic milieu, it is critical to determine which adolescents who display antisocial behaviors will be able to adjust to hospitalization and be the most open to treatment (Faurie, 1990). For effective prevention and subsequent treatment, it is necessary for clinicians to be able to predict

violent behavior with a satisfactory degree of accuracy (Merckelbach, Evers, Palmstierna, & Campo, 2002).

Accurate diagnostic decision-making is important to ensure that the most appropriate interventions are provided as well as a safer and more effective milieu (Vivona, Ecker, Halgin, Cates, Garrison, & Friedman, 1995). The consequences of incorrect diagnosis can be costly for both the child and treatment provider, particularly if psychotropic medications are prescribed. Although best practice dictates lengthy assessments (interviews, assessments, and observations from multiple sources) should be the norm, modern practice leans toward accuracy, briefness, and cost-effectiveness (Danielson, Youngstrom, Findling, & Calabrese, 2003). Inpatient psychiatric treatment settings allow for a defined context in which predictive methods using the above criteria can be designed and tested (Garrison, 1984).

Researchers have stated that youth who are aggressive toward others "constitute unique subgroups of psychiatric patients… However, few characteristics have been found to discriminate reliably youngsters who engage in disparate types of aggressive behavior during hospitalization." (Vivona, Ecker, Halgin, Cates, Garrison, & Friedman, 1994, p.435). Several important factors have been identified in the literature as having important predictive value of aggressive behavior in youth: past history (Borum, 2000; Day, Franklin, & Marshall, 1998; Farrington, 1995; Mossman, 1994), inattention/hyperactivity (Barkley, Fisher, Edelbrock, & Smallish, 1990; Borum, 2000; Brannigan et al 2002; Connor, Edwards, Fletcher, Baird, Barkley, Steingard, 2003; Farrington,1989; Loeber, Green, Keenan, & Lahey, 1995), and anger (Cornell, Peterson, & Richards, 1999; Furlong & Smith, 1998; 1994; Novaco, 1994).

Researchers have suggested that youth self-report measures can be valuable tools in the assessment and diagnosis of child and adolescent behavior problems (Andershed, Gustafson, Kerr, & Stattin, 2002; Danielson, Youngstrom, Findling, & Calabrese, 2003; Furlong & Smith, 1998; Loper, Hoffschmidt, & Ash, 2001; Moffit, 1996; Moffitt, Caspi, Silva, & Stouthamer-Loeber, 1995; Orpinas & Frankowski, 2001). While the prediction of aggression through these measures has not been as thoroughly studied in the child and adolescent populations as well as it has in the adult population, it has been suggested that this research be conducted (Minarik, Myatt, & Mitrushina, 1997).

Therefore, the goal of this study is to find out in which ways aggressive inpatient youth differ from nonaggressive inpatient youth based on self-report measures. Two instruments, in particular, could possibly be used as reliable self-report measures for the relevant predictive constructs: impulsivity, aggression, and anger. The Youth Self Report (Achenbach, 1991) has scales that measure Attention Deficit/Hyperactivity Problems, Aggressive Behavior, and Conduct Problems while the Adolescent Anger Rating Scale (Burney, 2001) measures Instrumental Anger, Reactive Anger, and Anger Control. Used together, these measures might provide valuable information on how to differentiate aggressive inpatient youth from their nonaggressive counterparts.

This information could help hospitals predict which adolescents might display higher levels of aggressiveness toward others while in treatment and display more overall behavior problems, resulting in a greater length of stay and a more restrictive placement upon discharge. Once identified, this knowledge may aid in devising effective treatment and discharge plans, in addition to maintaining a safe, therapeutic milieu.

CHAPTER II

REVIEW OF THE LITERATURE

Definitions and Categories of Aggression

The Merriam-Webster Online Dictionary (2003) defines the terms aggression and aggressive as follows:

> Aggression (n).1 : a forceful action or procedure (as an unprovoked attack) especially when intended to dominate or master.2 : the practice of making attacks or encroachments; *especially* **:** unprovoked violation by one country of the territorial integrity of another.3 : hostile, injurious, or destructive behavior or outlook especially when caused by frustration.
>
> Aggressive (adj.) 1 a : tending toward or exhibiting aggression behavior. b : marked by combative readiness. 2 a : marked by obtrusive energy. b : marked by driving forceful energy or initiative. 3 : strong or emphatic in effect or intent. 4 : more severe, intensive, or comprehensive than usual especially in dosage or extent.

Definitions of aggression differ among the various fields and disciplines that deal with youth. In the field of mental health, there are two main approaches to the problem of defining aggression: the statistical approach and the clinical diagnostic or medical approach. Both approaches are insufficient in ways. For example, an adolescent may exhibit aggressive behaviors that are statistically different from peers, however the

behavior may not be severe enough to warrant a diagnosis from the DSM-IV-TR. (Connor, 2002)

Connor (2002) does make a distinction between aggression and violence, noting that violence is "a physical force exerted so as to cause damage, abuse, or injury" (p.4) and the cause of violence can be either animate or inanimate physical forces (such as a tornado or hurricane). He goes on to state that only animals and humans can be aggressive. However, in the literature, the terms aggression and violence are often used interchangeably. Both aggression and violence will be described in this review of the literature with the understanding that human behavior is the mechanism behind both.

Another important distinction is made between adaptive and maladaptive aggression. In many circumstances, aggression is beneficial and necessary to provide safety. However, maladaptive aggression is defined by: occurring outside of a normal, defined social context, abnormal in regard to its causes in intensity, frequency, duration, or severity, or does not terminate appropriately. Often, these criteria are determined by societal norms for a given time (Connor, 2002). For the purposes of this study, aggression will be synonymous with maladaptive aggression.

Subtypes of aggression

There are also different subtypes of maladaptive aggression: overt and covert. Overt aggression is typically defined as an "openly confrontational act of physical aggression". Examples of this could be: threatening, blatantly defying authority, or physical fighting. Covert aggression is defined as "any hidden, furtive, clandestine act of aggression". Examples of this could be: destruction of property, stealing, or truancy.

(Connor, 2002) The two categories are often viewed as aggressive (for overt) and delinquent (for covert) behavior.

Several studies, using parent and clinician ratings, have illustrated these two subtypes of aggression as a continuum. Loeber and Schmaling (1985) determined from 28 studies of 11,603 children and adolescents that aggressive acts could be placed on a unidimensional scale with two poles. Achenbach, Conners, Quay, Verhulst, and Howell (1989) factor analyzed parent ratings for 8,194 children and adolescents. They found two factors of conduct problems: aggressive, which was made up of overt behaviors and delinquent, which was made up of the covert acts. In psychiatric facilities, the focus of assessment has typically been on the overt pole of the continuum of aggression (Connor, 2002).

A meta-analysis performed by Frick, Lahey, Loeber, Tannenbaum, Van Horn, Christ, Hart, and Hanson (1993) examined 60 factor analyses used in 44 reports of 28,401 youth. This analysis added an additional dimension to the subtyping of aggressive behavior: destructive aggression vs. nondestructive aggression.

Along with clarifying distinctions between differing types of aggression among youth, it is also necessary to examine the hypotheses that have been utilized in the past century to explain how maladaptive aggression is developed.

Development of Aggressive Behavior

Tremblay (2000) explains that "although aggressive behavior during the first five years of life has not been studied enough to understand the early developmental course of different forms of aggression… much work in the last twenty-five years has attempted to understand the developmental processes leading to aggressive behavior during the

elementary school years and adolescence" (p.129). Tremblay (2000) states that the researchers have attempted to explain the development of aggression by various hypotheses over the past century, such as biological factors or the social learning model of Albert Bandura. In the next section, these two prevalent theories will be examined.

Possible Biological Bases of Aggression

Genetics Studies

When studies of the development of any behavior or trait are undertaken, most often researchers begin with genetics. Mednick (1981) studied eight sets of monozygotic twins and found a 60% rate of concordance for aggressive tendencies, compared to 30% for fraternal twins. Renfrew (1997) found a 35% concordance rate for monozygotic twins compared to a 13% rate for the fraternal pairs.

Carey and Goldman (1997) summarized 17 modern twin studies from 4 different countries (9 from the U.S.) and found evidence for a genetic effect for aggression in all but one study of Norwegian adults. They also summarized the findings of 29 modern adoption studies and found a genetic effect for aggression in all of the studies. Twins raised apart still show significant similarity despite their lack of environmental similarities and personal interaction. This pattern is found with the comorbidity between antisocial behavior and alcohol/substance abuse/addiction. Evidence for the heritability of violent behavior is less consistent than it is for deviance and aggressive behavior in general.

Hutchings and Mednick (1974) continued by looking at adopted convicted criminals, comparing the amount of convictions their biological fathers received versus

their adoptive fathers. They found that biological fathers were over twice as likely to have been convicted of a crime (70 to 33).

Brain Anatomy Studies

Researchers also began to study differences in anatomy, particularly in the structure of the brain. The limbic system is considered to be the primary structure in the brain that is involved with aggression. It appears to influence the regulation of aggressive behavior, along with the neocortex (Furlong & Smith, 1994).

Brain damage, or traumatic brain injury, can also lead to an increase in aggression. Damage to the frontal lobe, in particular, can result in lack of ability to control rage and violent behavior. However, this does not always lead to aggression. It will often depend on the timing, severity, and cause of the injury combined with the personality of the individual pre-injury (Golden et al. 1996).

Other injuries associated with increases in aggression are brain damage associated with tumors and cerebral vascular accidents (Silver & Yudofsky, 1987). This often is demonstrated by unprovoked anger and acts of rage, resulting from a loss of behavioral control. With children and adolescents, research has demonstrated that the earlier the frontal lobe damage, the more likely the person will exhibit lack of inhibition and increased aggression, possibly due to the fact they have had less of an opportunity to develop behavioral regulation skills (Golden, Jackson, Peterson-Rohne, & Gontkovsky, 1996).

Intelligence Studies

Many studies have sought to determine if a low Verbal Intelligence Quotient as compared to a significantly higher Performance Intelligence Quotient is predictive of

violent behavior in adolescents (Golden et al., 1996; Moffitt & Lynam, 1994). In fact a global IQ deficit of about half a standard deviation when comparing antisocial youth and their counterparts is considered by Connor (2002) to be "one of the most robust findings in the neuropsychological study of antisocial youth" (p.168). He cites three studies that convey this fact even when controlling for social disadvantage (SES) and race. In a recent study, Cornell, Peterson, and Richards (1999) found no significant correlation between IQ and institutional aggression.

Physiological Arousal Studies

Arousal research is another important facet in the biological determination of aggression. One way in which arousal is measured is by electrodermal activity. Electrodermal activity is typically measured by skin conductance levels or spontaneous fluctuations (within the skin conductance levels). Raine (in Ferris and Grisso, 1996) performed a meta-analysis of arousal research relating to childhood aggression. Five of the 11 studies reported significant effects, two of which were effects for skin conductance levels.

Connor (2002) summarized eight cross-sectional studies and found that five of the studies reported significantly lowered electrodermal activity in the aggressive children. Two of the studies reported negative results and one reported significantly higher electrodermal activity in the aggressive sample. Interestingly, two of the cross-sectional studies found no interaction between hyperactivity and electrodermal activity. In four longitudinal studies, the researchers found a significant relationship between underarousal and children with conduct disorder (Connor, 2002).

Resting heart rate level and heart rate reactivity have also been used as a measure of arousal, and is considered one of the best indicators of physiological indicators of aggression. Fourteen separate studies of aggressive children found significant effects of lower resting heart rates. The effect sizes averaged .84 (Raine, 1996).

Connor (2002) also analyzed several studies of resting heart rate level. Of eight cross-sectional studies, four reported lower rates in aggressive youth, three found no significant differences, and one obtained opposite results. In five longitudinal studies, four found a significant relationship between lower resting heart rate and later aggressive acts by children and adolescents, and one did not find a significant relationship. The opposing results may be a feature of the researchers mixing of adolescents and children in their samples, which would lead to more variance in the expected heart rates.

Raine (in Ferris and Grisso, 1996) explains that aggressive children appear to display orienting deficits to arousal to events of low interest (such as school work). They are particularly sensitive to the "type of salient and immediate rewards associated with an antisocial and violent way of life" (p.57). In fact, in her nine-year study, measures of skin conductance and heart rate was used to demonstrate low physiological arousal and ability to orient to exciting or novel stimuli. This was found to be predictive of later aggressiveness. These measures of arousal predicted with a 74.7% rate which 15-year-old boys would perform criminal acts at age 24. This trend was also demonstrated by Kindlon, Tremblay, Mezzacappa, Earls, Laurent, and Schall (1995). They found that low resting heart rates from ages 9-12 was associated with higher rates of fighting from ages 5-12.

Two hypotheses have developed from these results. The first is that the low levels of arousal indicate lower levels of fear. This lack of fear possibly predisposes the child to act out regardless of consequence. The second hypothesis is from the stimulation-seeking theory. Low arousal children actively seeks out stimulation in order to get themselves back to a more "normal" level.

The stimulation-seeking hypothesis implies that children with lower SES backgrounds may be more at risk to demonstrate aggressive behavior. Without adequate stimulation (as would typically be provided in middle-class and above homes), the child would seek out activities that would give them a sense of excitement. However, resting heart rate tends to predict aggressive behavior better with adolescents from higher SES backgrounds. The same trend was found skin conductance. In fact, Satterfield (1987) found that biologically high-risk persons were up to 28 times more likely to have committed criminal acts than their biologically low risk counterparts if they came from a higher SES background. However, this was challenged by the findings of Kindlon et al. (1995). They found a relationship between heart rate and aggression even among the low SES sample.

Another method of studying arousal is through Event-Related Potentials (ERPs). Using an Electroencephalogram (EEG), the amount of electrophysiological response to sensory stimuli can be measured. These measures have been used in studies of juveniles with aggressive behavior, ADHD, and antisocial behaviors. However, this literature is very mixed at best, because no single ERP profile or "signature" can be determined precisely. In fact, this method of research should be rejected when using children or

adolescents because their ERPs tend to fluctuate much more than adult subjects (Connor, 2002).

Connor (2002) suggests a similar rejection of the use of EEG profiles or activity to differentiate between aggressive children/adolescents and their counterparts, as has been done with adult subjects. Again, the literature is mixed. However, Connor states that 3 out of 4 longitudinal studies have given evidence of cortical underarousal (as measured by the EEG) in children that later became delinquent in adolescence and early adulthood. In the study that did not find this, Connor (2002) explained that the researchers used groups of hyperactive children with and without delinquency and therefore possibly skewed the results due to the inherent differences in the population.

Another physiological sign studied in aggressive youth is pain sensitivity. Seguin, Pihl, Boulerice, Tremblay, and Harden (1996) studied 177 adolescent boys who had been assessed beginning in kindergarten for continual aggressive behavior. These adolescents were found to have been less sensitive to pain than their nonaggressive or less aggressive counterparts.

Hormonal Studies

Biological aggression research has also examined hormonal influences studies. The positive relationship between testosterone and aggression in nonhuman subjects and aggressive behavior has been well studied and documented (Book, Starzyk, & Quinsey, 2001). However, a much weaker relationship has been found in the studies utilizing human subjects. Book et al. (2001) performed a meta-analysis of 45 independent studies of human subjects. They found a mean weighted correlation of $r = 0.14$, signifying a weak positive relationship.

Studies on cortisol, a stress hormone used as an indicator of Hypothalamic-pituitary-adrenal (HPA) axis arousal, have been performed on aggressive individuals. Again, the evidence is mixed in this literature. Of 24 studies, only 9 cross-sectional studies found a significant inverse relationship between the measure of cortisol (using urine, saliva, or plasma) and aggressive behavior. Ten cross-sectional studies did not find any significant differences, and one study found a significant positive relationship with cortisol and aggression. Using longitudinal studies, the literature is stronger, with three out of four finding a positive relationship (Connor, 2002).

Neurotransmitter Studies

Lower Platelet Serotonin measures have also been studied in association with aggression in children and adolescents. Kruesi, Rapoport, and Hamberger (1990) found that cerebrospinal fluid (CSF) 5-hydroxyindoleacetic acid (H-HIAA) concentrations were lower in youth who were diagnosed with disruptive behavior disorders as opposed to OCD diagnosed children. Unis, Cook, Vincent, Gjerde, Perry, Mason, and Mitchell (1997) studied 43 male adolescent juvenile offenders and found that their whole blood serotonin levels were higher in the youth with a conduct disorder, childhood onset type diagnosis than were the levels for the conduct disorder, adolescent onset type youth. Whole blood serotonin levels also demonstrated a significant positive relationship with violence ratings of their offenses and staff ratings of social skills impairment. However, Modai et al. (1989) assessed the 5-HT uptake by the platelet measures in adolescent psychiatric patients. Their findings were inconsistent, only noting a relationship between the serotonin levels in schizophrenic adolescents and violent suicides.

Blumensohn, Ratzoni, Weizman, Israeli, Greuner, Apter, Tyano, and Biegon (1995) found a lowering of 5-HT receptor binding in juvenile delinquents who are not on psychotropic medications. Matykiewicz, Grange, Vance, Wang, and Reyes (1997) found that the 5-HIAA levels for adjudicated adolescents were significantly lower than the levels of the control adolescent group. LeMarquand, Pihl, Young, Tremblay, Seguin, Palmour, and Benkelfat (1998) reported three experimental studies in which dietary depletion of tryptophan was used to reduce 5-HT synthesis in adolescent subjects. They stated that while one laboratory study found a small effect, two other studies demonstrated no effect. Lahey, Hart, Pliszka, and Applegate (1993) admit that although the current literature is not strong, there is enough evidence to drive continued study of this relationship.

Summary of Biological Research

All of the indicators of underarousal in youth lend some credence to its importance in the expression of aggression. If some youth are inherently fearless, then they might be more likely to engage in aggressive acts. Underaroused or understimulated youth may seek out aggressive acts to provide themselves with a more "normal" physiological state. However, the physiological research is often conflicted and does not explain all of the reasons for aggressive behavior. It ignores factors such as learning, motivation, and emotionality (Connor, 2002).

Drive Theories: Frustration-Aggression Hypothesis

One of the earliest theories of the etiology of aggression in humans was developed by a group of psychologists (Dollard, Doob, Miller, Mowrer, & Sears) at Yale University in their book Frustration and Aggression (1939). They believed that biology,

combined with the psychoanalytic theories of Freud comprised most of the reasons that an individual would display aggression. Freud believed that individuals acted aggressively due to unmet needs, i.e. frustration. This aggression was often termed "reactive aggression" due to the fact that one is acting out in order to defend against a threat or to harm a source of frustration (Connor, 2002). They took the frustration-aggression hypothesis and translated it into behavioral terms (Heusmann, 1994). Dollard et al. believed that "every aggressive action could ultimately be traced to a previous frustration" (Berkowitz, 1993, p.32). This led to the frustration-aggression hypothesis being empirically tested and summarily dismissed shortly after. Researchers then latched on to Albert Bandura's social learning theory as an explanation of the development of aggression (Heusmann, 1994).

Social Learning Theory

Albert Bandura wrote his first book on the subject of aggression, *Adolescent Aggression*, in 1959. Bandura found the dominant theory of this time, behaviorism, a bit too simplistic for the phenomena he was observing. He agreed that environment causes behavior, but added that behavior causes environment as well. He labeled this concept reciprocal determinism. This concept described how the environment and the person's behavior cause each other (Bandura, 1965). In opposition to the model of reactive aggression (Frustration-Aggression Hypothesis), Bandura believed in "instrumental" aggression. In instrumental aggression, aggression is a "learned phenomenon reinforced by social role modeling and positive outcomes for aggressive behaviors in social settings" (Connor, 2002, p.19).

Bandura (1965) then began the series of "bobo doll studies". He made of film of one of his students, a young woman, beating up a bobo doll. Children who observed the film imitated the woman (Bandura, 1965).

What Bandura found was that these children changed their behavior without first being rewarded for successive approximations to that behavior. He called this phenomenon, observed in the Bobo Doll experiment, observational learning or modeling. The resulting theory is called social learning theory. (Bandura, 1965)

Bandura did a large number of variations on the study: The model was rewarded or punished in a variety of ways, the kids were rewarded for their imitations, the model was changed to be less attractive or less prestigious, and many variations, even substituting a live clown for the Bobo doll, with similar results (Bandura, 1965).

Bandura believed that there were four processes involved in learning from models: attention, retention, reproduction, and motivation. The first process is attention. A learner must first be attuned to the actions that the model will perform. Competing stimuli or lack of attention can detract from the amount of learning that takes place through the model's behavior. (Bandura, 1965)

The next process is retention. Bandura believed that you have to remember what the model did so that the behavior can be replicated. It is believed that this occurs through the use of mental imagery and verbal descriptions. (Bandura, 1965)

The third process is reproduction. First, the person modeling the behavior must be able to physically perform the task that is being learned through the model. Next, the person modeling the behavior then reproduces that behavior that they have previously stored in their memory. (Bandura, 1965)

The final process is motivation. Learners are motivated by the expectation of reinforcement. This can occur through three methods. The first is past reinforcement, or simply classical behaviorism. The second is through promised reinforcement, or what the learner can imagine will happen.

Finally, the concept of vicarious reinforcement is introduced. Vicarious learning occurs when a person observes the consequences of another person's behavior and adjusts their own behavior accordingly. Also, motivation does not only include the concept of reinforcement but also punishment. Both of these concepts of motivation can influence the learner. (Bandura, 1965)

Another concept that affects observational learning is the attributes or characteristics of the model. The first attribute is the perceived similarity of the model. The more the model is perceived as similar to the learner, the more effective the modeling tends to be. The next attribute is the perceived competence of the model. The more competent the model appears, the more likely the learner will model the behavior. The final attribute is perceived status. The higher the perceived social status of the model, the greater the potential for the learner to model the behavior (Eggen & Kauchak, 2001).

Bandura identified three types of models: familial, cultural, and symbolic (media). Many researchers have focused on these interactions: within the family, with peers, and through media (Tremblay, 2000).

Families are the first aggressive models for many children. In delinquent children, higher incidences of familial aggressive modeling are found than for nondelinquent children. However, in middle-class families that have produced violent

children, the parents have been found to model less blatant forms of aggression, such as using aggression in word and attitude to solve problems, rather than in actuality (Bandura as reported in Knutson, 1973).

Sears, Macoby, and Levin (1957), interviewed 400 mothers were about their discipline techniques, attitudes toward child aggression, and children's aggression toward peers, siblings, and parents. The researchers found a significant relationship between the use of physical punishment by parents and subsequent aggressiveness in those children. This effect was greater if the physical discipline was in addition to high permissiveness of parents toward aggression. (Bartol & Bartol, 1986)

Kaj Bjorkqvist (in Feshbach & Zagrodzka, 1997) investigated the degree to which adolescents imitated their parent's behavior patterns when they themselves are angered, at home or with peer groups. Four groups of adolescents were presented with the Anger Scale (Bjorkqvist & Osterman, 1992), which investigates the modeling process of aggressive behavior with three versions: Mother, Father, and Self.

Using a series of item-wise multiple regressions, the data were analyzed. The parental behaviors served as the independent variables and the subjects' behaviors as the dependent variables. The researchers found that modeling indeed does occur, with girls modeling (both aggressive and nonaggressive behaviors) their mothers and fathers equally in the context of the home environment. The boys' behavior, when angered at home, was predicted by the modeled behaviors of their parents. However, the boys imitate their fathers to a greater degree than their mothers. When angry with their peers, the girls were found to only be affected by their mother's behavior. The boys also were more affected by their mothers' behavior when they were angry with peers.

Dadds, Barrett, Rapee, and Ryan (1996) studied the effects that parental behaviors during family discussions had on children's behavior, anxiety and aggression in particular. The two groups of children were an anxious group (DSM-II-R criteria for anxiousness related disorders) which consisted of 66 children and a comparison group (non-clinical population) which consisted of 18 children and an AGGRESS group (diagnosed with Oppositional Defiant Disorder or Conduct Disorder) which consisted of 16 children. They found very few differences in the groups. They found that the fathers of aggressive children were more likely to propose aggressive response plans to aggressive situations. Mothers of aggressive children were also found to be less likely to point out positive consequences than in the anxious and non-clinical samples. However, no differences were found for communication of negative consequences.

Swinford, DeMaris, Cernkovich, and Giordano (2000) studied the relationship harsh physical discipline in childhood and problem behaviors during adolescence and young adulthood. The researchers suggest that, as stated through social learning theory, those who are subjected to harsh discipline learn that aggression can be an effective way to control the behavior of others. Therefore, it was assumed that individuals who undergo harsh physical discipline as children are at higher risk of abusing their romantic partners later in life.

Swinford, DeMaris, Cernkovich, and Giordano (2000) used a longitudinal study, in which 608 cases were followed from 1982 until 1992-1993. A significant relationship was found between harsh physical punishment in childhood and perpetration of violence toward a romantic partner later in life. Also, harsh physical punishment in childhood was found to be indirectly but significantly related to increased perpetuation through

additional variables (factored into the study) of adolescent and young adult problem behavior.

Parental models are not the only models that can influence the social learning of aggression. Subcultures can greatly influence social development and development of aggression in children. "… The highest rates of aggressive behavior are found in environments where aggressive models abound and where aggressiveness is regarded as a highly valued attribute (Knutson, 1973, p.156)." This aspect of social learning of aggression is discussed in the next few studies.

Xie, Cairns, and Cairns (1999) studied the relationship between the peer group affiliation of students with Emotional and Behavioral Disorders and aggressive behavior. The researchers studied 506 students in the 4^{th} through the 7^{th} grade. A significant result was found between similarity of peer groups and aggressiveness ($r = .39$; $p < .001$) with the middle school girls. A similar result was found with the groups of boys. Aggressive boys tended to be in the same peer groups ($r = .32$ with both elementary school and middle school). In summary, aggressive students tended to affiliate with other aggressive students and non-aggressive students tended to affiliate with other non-aggressive students.

The last model that Bandura discussed was symbolic models. " … Response patterns portrayed either pictorially or verbally can be learned observationally about as well as those presented through social demonstration (Bandura as reported in Knutson, 1973, p. 189)." Television has greatly broadened the range of models that children and adolescents are exposed to on a daily basis. Bushman (1998) noted that more than half of major actors and one third of all actors on television are involved in violent interactions.

Bushman also noted that by the time the average child finishes elementary school, he/she can have witnessed over 8,000 murders and more than 10,000 other acts of violence on broadcast television. By the age of 16, most children have spent more time watching TV than in school and may have witnessed more than 13,000 murders/killings on TV. Also, aggressive children tend to watch more television than nonaggressive children (Bartol & Bartol, 1986).

Hogben (1998) used learning theory and a meta-analysis to analyze the relationship between watching televised aggression and aggressive behavior in the viewer. He found a small increase in viewer aggression due to viewing televised aggression ($d = 0.21$, $p < .05$). There was a curved relation between effect size and televised aggression exposure ($r = .37$, $p < .001$). He also found that viewing justified aggression produced a larger effect size than watching nonjustified aggression ($d = 0.30$, $p < .001$ for justified aggression to $d = 0$ for nonjustified aggression). Viewing inaccurate consequences (or no consequences at all) produced a larger effect than did watching accurate consequences ($d = .25$ vs. $d = .10$). All of these effects lead the researcher to conclude that viewing televised aggression is related to viewer aggression.

Bushman (1998) wanted to examine if observing violent media made aggressive constructs more accessible to the viewers. Using 200 undergraduate students, Bushman broke them up into two groups (100 each). The first group was shown a "violent tape", which was The Karate Kid III. The second group was shown a "nonviolent tape", Gorillas in the Mist. In a previous study, Bushman determined that there was no difference in the amount of cardiovascular arousal as a result of watching the two tapes,

however, higher levels of anger and aggressive behavior were found between groups of subjects that watched the two videotapes.

Using a speed of association test, participants were asked to associate meanings of homonyms (which had both a violent or nonviolent association to each: e.g. box, punch, sock) and then of words that were deemed nonaggressive. Bushman (1998) found that the participants who saw the violent video gave a greater number of aggressive associations to the presented homonyms than did the subjects that viewed the nonviolent video [$F(1,196) = 9.33$, $p < .05$]. He also found that subjects that viewed the violent video were more likely to make aggressive associations to the nonaggressive words [$F(1,196) = 0.09$, $p > .05$, $d = 0.04$].

Summary of Social Learning Theory Research

In summary, modeling and reinforcement were the two most salient factors accounting for aggressive behavior in these studies. However, while this research has been beneficial in laboratory experiments whose goals were to briefly increase aggression, this research does not take into account the limited effectiveness of social skills training and current milieu modeling approaches in reducing aggressive behavior (Stowe, 1994). Learning theory, like biological factors, is inadequate when considering that aggression is expressed differently for individuals throughout the lifespan. Furlong and Smith (1994) explain, "Aggressive behavior is a complex mixture of biological factors and environmental factors (p.78)", therefore it is difficult to ascertain which had the greatest effect. Human development studies add another aspect to the development and expression of aggression.

Prevalence of Aggression

Childhood Development/Differential Expression

Aggression has always been a component of human development. However, aggression typically takes different forms as a child moves throughout the life span. Aggression will come to serve different purposes the older the child becomes and the more the environmental situations change. In the first two years of life, particularly in the period from 12-18 months, it is estimated that 50% of nursery school social exchanges can be viewed as physically aggressive in nature. However, for most children, this percentage decreases to around 20% by the age of 2.5 (Holmberg, 1977). Goodenough (1931) noted that a trend to replace physical aggression with verbal aggression tends to take place at this time period from 2 – 4 years of age.

Before the age of 6 years old, children tend to utilize what is called instrumental aggression, meaning that they will act aggressively toward others in order to obtain tangibles, space, or privileges (Rule, 1974). In the next couple of years, children begin to utilize aggression more as a retaliatory measure due to some insult or injury. As children continue to grow older, this tends to take form as verbal aggression versus physical aggression (Parke & Slaby, 1983). This culminates for normal children in the transition from overt aggression (physical fighting) to more covert forms of aggression such as lying, cheating, stealing, or rule breaking behaviors in adolescents (Leber, 1990). These findings were replicated a study of more than 22,000 children in 1994 by Tremblay, Boulerice, Harden, McDuff, Perusse, Pihl, & Zoccolilio (1996). They found that for most children, frequency of physical aggression decreases from the third to eleventh year of life but indirect aggression increases from four to eight years of age.

Unfortunately, the tendency to resort to physical violence does not completely vanish when a child moves to adolescence. In fact, homicide is the second leading cause of death among 15 to 24 year olds and the third leading cause of death for those aged 10 to 14 years (Stoff, Breiling, & Maser, 1997). Researchers have noted that while the frequency of violent acts decreases for most youth, it is at adolescence when many criminal careers begin.

Farrington, Lambert, and West (1998) conducted a longitudinal study in London where they followed 411 males from age 7 into adulthood. They found that criminal careers began at an average point between 14 and 21 years of age and lasted an average of 10 years. Equal proportions of their offending were committed in the following age periods: 10-16, 17-20, and 21-32 years of age. Therefore, it is of great societal importance to identify potentially and/or currently aggressive children and adolescents and to provide thorough and effective treatment so that the developmental course of aggression can be stopped. As the following will attest to, rates of aggression occurring within society, and in particular, the U.S. public schools, is a significant problem.

Adolescent Aggression in Society/Schools

Rates of youth aggression peaked in our country beginning in the late 1980's and continuing into the early 1990's. The media has bombarded us with images portraying the proliferation of gang violence and shooting rampages in our schools. The consequences of youth violence are far reaching, and the government, penal system, school system, and mental health profession all are intervening at different levels. How we identify, assess, refer, and treat these aggressive adolescents is of concern for each of

these facets of our society, and each have made unique contributions in attempts to solve this problem. (Connor, 2002)

Since 1973 the Bureau of Justice Statistics' National Crime Victimization Survey (NCVS) asked a nationally representative sample of persons ages 12 and up about violent crimes in which they were the victim. They found that serious violent victimizations peaked nationally around 1993 (4.2 million). In the next four years, the number dropped to 3 million (27% decrease). The rate of aggravated assaults among juveniles declined 33% from 1994 to 1995 and has remained relatively stable. However, it should be noted that approximately two-thirds of all serious violent crimes are aggravated assaults (Snyder & Sickmund, 1999).

While individual schools and districts are not required to supply data about crimes to any one particular reporting agency, there are some estimations. In 1996-97, 10% of public schools reported at least one serious violent crime to the police. Forty-seven percent of schools reported at least one less serious violent or nonviolent crime. In the middle and high schools, physical attack or fight without a weapon was the most commonly reported crime in 1996-1997. This translated into 9 per 1,000 students for middle schools and 8 per 1,000 for high schools (DeVoe, Peter, Kaufman, Ruddy, Miller, Planty, Snyder, Duhart, & Rand, 2002).

In regard to disciplinary reports, elementary schools were much less likely than middle or high schools to report any type of crime in 1996-1997. Middle school and high school teachers were more likely to be victims of violent crimes (the majority were assaults) than their elementary school cohorts. This translates to 35 per 1,000 teachers for middle schools and 49 per 1,000 teachers for high schools. Nine percent of teachers

were threatened with injury by a student in the school year 1999-2000, and 4% were physically attacked by a student (DeVoe, Peter, Kaufman, Ruddy,, Miller, Planty, Snyder, Duhart, & Rand, 2002).

In 2000, adolescents were victims in approximately 1.9 million total crimes of violence or theft at school. Of this, only 47 were school-associated violent deaths during the school years of 1998 and 1999, 33 of which involved school-aged children (DeVoe, Peter, Kaufman, Ruddy, Miller, Planty, Snyder, Duhart, & Rand, 2002).

Nonfatal crimes against students at school declined from 144 per 1,000 students in 1992 to 101 per 1,000 students in 1998 and 72 per 1,000 students in 2000. The rate of serious violent crimes against students at school remained consistent from 1992 to 1998. In 1998, the ratio of students who were victims of violent crimes at school were 9 per 1,000 students versus 21 per 1,000 students who were victims while away from school. The rates of nonfatal victimization of students ages 12 to 18 are 14 per 1,000 students away from school and 5 per 1,000 students at school. (Small & Tetrick, 2001)

In 1993, an estimated 16% of high school students in this country have been in one or more physical fights on school property in the course of a year (Lockwood, 1997). Victimization rates for simple assault are highest among adolescents (12 to 19 years of age). In 2001, 33% of students reported being in a fight either at or away from school (Small & Tetrick, 2001).

In 2001, 8% of students reported they had been victims of bullying behavior in the last six months, which is an increase of 3% from the 1999 statistics. From 1993 to 2001, the percentages have remained stable (7-9%) for 9th through 12th grade students who were threatened with or injured by a weapon on school property within the last year.

In 1995, high school seniors were polled and found the following rates of threatening victimization at school: 15% threatened with a weapon and 23% threatened without a weapon. Of these seniors, 4.7% had been injured by a weapon and 11.4% had been injured without a weapon (U.S. Department of Education, 1995).

Malek, Bei-Hung, and Davis (1998) sought to compare attitudes toward violence among 7th grade students in three communities. They found that 34% of students had fought at least once and 7% had fought more than four times during the previous month before the study. Five percent of students reported skipping school due to fear of violence.

Peer to peer violence is not the only statistic reported. Teachers also are victims of violent crimes committed by adolescents. In the years between 1994 and 1998, 133,700 violent crimes were committed against teachers at school, which reflects an annual rate of 31 violent crimes per 1,000 teachers a year. In urban schools, this rate was 40 per 1,000 teachers, but only 24 per 1,000 in suburban or rural districts. (Small & Tetrick, 2001)

From 1995-2000, urban teachers were victims of violent crimes at a rate of 36 per 1,000 teachers as opposed to 21 and 17 per 1,000 teachers from suburban and rural districts, respectively. (DeVoe, Peter, Kaufman, Ruddy,, Miller, Planty, Snyder, Duhart, & Rand, 2002)

This obviously has an effect on the educational environment. Small and Tetrick (2001) found that 88% of 8th grade students and 65 % of 12th grade students reported that teaching was interrupted by student misbehavior in a 1998 survey.

Children and Adolescents are more frequently being placed in psychiatric hospitals or residential treatment facilities, for treatment and prevention of these aggressive behaviors (Day, Franklin, & Marshall, 1998).

Inpatient Rates of Aggression

Rates of inpatient aggression vary from among hospitals, depending on the type of patients they receive. In these settings, aggression often comes in the form of physical violence, verbal threats, self-injurious behaviors, or destruction of property. These behaviors often are very costly in regard to patient/staff injuries, property, and disruption to the therapeutic milieu (Connor, 2002).

Studies report rates of 15 to 28% for physically assaultive behavior and up to 40 to 50 % for other types of dangerous behavior (Otto 1992). The majority of aggressive events tend to come from a select minority of patients. While the behavior tends not to result in serious injury to staff, it compromises the patient's safety, negatively affects staff morale, and damages the therapeutic milieu (Ross, Hart, & Webster 1998).

This pattern of aggression tends to continue even after discharge from the inpatient environment. Patients discharged from psychiatric services engage in violent acts during a one-year period at an estimated 25 to 50 % (Ross, Hart, & Webster 1998).

Saverimuttu and Lowe (2000) noted that acts of aggression occurred frequently in inpatient psychiatric units, and that most of the aggression is directed toward nursing staff. A small number of patients usually are involved in a high percentage of the aggressive acts that occur on the units. During their study period (15 months), 170 patients were admitted to the unit. In all, 167 acts of aggression were committed.

However, the 167 incidents involved only 57 patients, 17 of whom were female and 40 were males.

Fottrell (1980) looked at prevalence rates of aggression in three British psychiatric hospitals, and found that approximately 10% of patients had been violent during a study period. In a study by Vesavage (1983), 15% of the psychiatric patients admitted during the study period committed at least one physical assault.

During a six-month period in 5 psychiatric hospitals in Sydney, Australia, Owen, Tarantello, Jones, and Tennant (1998) counted and analyzed acts of aggression within the inpatient units. The sample included 855 patients and 1,289 aggressive incidences were reported. However, a relatively small section of those patients (20) caused 857 of the incidents.

Cunningham, Connor, Miller, and Melloni (2003) also studied 515 psychiatric staff that responded to a survey if they had personally encountered physical aggression. Of the respondents, 429 (83.3%) reported having been threatened verbally and 333 (64.7%) reported having been physically assaulted. The surveys also inquired about the prevalence of aggression overall on the units. Staff gave the following prevalence rates for aggression on the units at which they worked: 92.1% for verbal aggression, 80.0% for physical aggression, 74.4% aggression against property, and 73.6% self-injurious aggression. 62.3% of staff reported that all of the preceding types of aggression were prevalent on their units while only 4.1% reported that none of the above was prevalent (Cunningham et al, 2003). Lam, McNiel, and Binder (2000) found in their eight-month study, that of the 390 patients admitted to the psychiatric unit, 76 patients caused injury to staff.

Walker and Seifert (1994) studied prevalence rates. In six months, there were 58 admissions (48 patients). During this span, there were 37 assaults, 34 of which were against staff and the remainders were against other patients. Bradley, Kumar, Ranclaud, and Robinson (2001) found that over a twelve-month period, there were 381 admissions and 58 reported incidences of aggression (25 verbal and 33 physical). Nijman, Campo, Ravelli, and Merckelbach (1999) found almost one aggressive incident per day in a psychiatric ward.

Garrison (1984) studied 100 male children (7-15 years of age) in an inpatient psychiatric treatment facility over a two-year period. He found 1038 incidents of observed, interpersonal aggression. Interpersonal aggression was described as "intense physical attacks on other persons (staff members or peers)" as opposed to verbal aggression or brief physical exchanges.

In summary, prevalence rates for individual patients to become aggressive have been reported from 15% to 28% and the recidivism rate anywhere from 25% to 50% upon discharge (Otto, 1992; Ross, Hart, & Webster, 1988; Vesavage, 1983). In terms of actual incidences of severe aggression towards others, rates have been reported from 5 to 214 incidents per month depending on the population served and size of the facility (Saverimuttu & Lowe, 2000; Tarantello, Jones, & Tennant (1998); Walker & Seifert, 1994).

This aggression has a considerable financial impact, not only to society (through insurance premiums and Medicaid costs) but also to the treatment facilities themselves. According to Nijman, Merckelbach, Evers, Palmstierna, & Campo (2002) the average cost to the hospital per injury was estimated to be $5719. Since the total number of

serious injuries in that sample was 134, the total annual cost was $766,290. In a smaller hospital sample, Lanza & Milner (1989) found an annual cost to their hospital of $38,000 due to patient violence.

As noted by the prevalence rates and the cost to both society and the treatment facilities themselves, a reliable, practical means to predict which youth may become aggressive would be a great benefit. Various hypotheses about how aggression should be predicted have been developed.

Prediction of Aggression

Social scientists began to study prediction of aggression among youth in the 1960's. Since this date, there have been different theoretical approaches of how violence risk should be assessed. The first approach was unaided clinical risk assessment. This approach was characterized by low inter-rater reliability, low validity, a failure to specify how exactly decisions were made, and lower predictive validity when compared to actuarial methods (which will be discussed below). (Dolan & Doyle 2000)

Next is the violence prediction model, which viewed aggression as a permanent trait that resided in the individual and was not subject to change. Therefore, prediction of future aggression was usually made by a clinician who would gather historical background information, look at the results of various psychological tests such as the MMPI or projective measures, and then make an inference to whether or not the person would be a future risk for violence. Prediction research that was conducted in this fashion yielded very few promising results (Borum, 2000). In fact, Derzon (2001) meta-analyzed 58 trait aggression studies and found a correlation of .33 and that prediction

using this method failed to identify 66% of those subjects who were aggressive at a later time.

Lack of results from the first approaches in violence prediction lead to more of a reliance on the use of actuarial formulas (statistical equations) for the prediction of future violence (Borum, 1996). In fact, these formulas perform as well or better than clinical judgments (Borum, 2000). This is especially the case when the formulas are consistently and appropriately applied. (Borum, 2000) However, it has been argued that actuarial methods ignore individual variations to risk, focus too much on relatively static variables, fail to prioritize clinically relevant variables, and minimize the role of professional judgment (Hart, 1988).

The second trend in assessment of violence potential has been the use of structured clinical assessments, which represents a composite of empirical knowledge and professional expertise. In this type of assessment, the researcher would use a checklist of factors that have been demonstrated by research to have a relationship to violence recidivism. However, this type of approach has had limited predictive accuracy due to the fact that clinicians don't consider the relevant factors when making their risk decisions (Borum, 2000).

More recently, researchers have come to view prediction of aggression not as simply determining or identifying a single trait inherent in the individual, but rather have begun to see the task as determining "the nature and degree of risk a given individual may pose for certain kinds of behaviors, in light of anticipated conditions and contexts (Borum, 2000, p.1265)". Hart (1988) suggests that the structured clinical assessments (using empirically based instruments) allows for systematic data collection which is data-

based, but also allows for the professional to utilize their knowledge to determine how that data will fit the situations that the person will be placed in the future.

Perhaps the most logical statement about prediction comes from Van Praag, Plutchik, and Apter (1990). They suggest that there may be an interaction between certain risk factors, such as personality variables, demographic variables, and social variables, which together influence the likelihood of aggressive behavior being expressed by the individual.

Identified Risk Factors/Predictor Variables

Bjorkly (1995) wrote a review article of 200 articles and book titles on the topic of prediction of aggression in psychiatric patients from 1970 to 1994, using Excerpta Medica, Medline, Psych Lit, PsychInfo, National Criminal Justice Reference Service, Criminal Justice Periodical, and Legal Resource Index. Many more prospective prediction studies have been performed using adult samples than have been performed using child and adolescent samples. Traditionally, these studies have focused on the use of clinical assessment, demographic data, and assessment data (projectives, self-report scales, observer rating scales, etc.), (Bjorkly, 1995).

Past History

One of the most robust risk factors in the empirical literature of child/adolescent aggression are historical factors. In other words, past violent or aggressive behavior is probably the best predictor of future violence (Mossman, 1994). In fact, risk for future aggressiveness increases in proportion to the number of previous acts (Borum, 2000). Also, the earlier the onset of aggressive behavior, the higher the risk of more chronic and serious violence. This is particularly true of an onset before 14 years of age. Farrington

(1995) found that of a sample of boys who had been convicted of a violent offense between 10 and 16 years of age, 50% of them were convicted of a similar offense by early adulthood, compared to an 8% rate of violent offense conviction for those young adults with no juvenile convictions.

Day, Franklin, and Marshall (1998) studied a sample of 100 adolescents (43 girls & 57 boys) from a state psychiatric hospital unit over a 14-month period. Using discriminant function analysis, IQ was not found to be a significant function for aggression. However, aggression for girls was associated with having a family history of violence, being of a minority race, and being on medication. In boys, aggression was associated with having a conduct disorder diagnosis, being on medication, and having previous hospitalizations.

Family Structure

Brannigan, Gemmell, Pevalin, and Wade (2002) studied 13,067 4-11 year old children looking at several potential risk factors for the development of aggressive behavior. They found that having an intact family (both parents in the home) reduces the mean for childhood misconduct (rule breaking or aggressive behavior) by 35% and a unit increase in SES reduces the mean by 85%.

Exposure to Violence

Community violence exposure is considered by many to be one of the strongest predictors of violence among youth (Halliday-Boykins & Graham, 2001).

O'Keefe (1997) studied a sample of 935 urban and suburban high school students using the Youth Self-Report and their reports of witnessed violence. She found that exposure to community and school violence was a significant predictor of aggressive

acting out behaviors, even when family violence and other demographic variables were controlled for. Halliday-Boykins and Graham (2001) found the strongest correlations between the factors of neighborhood deviance and subsequent deviant peer affiliation.

Abuse/Neglect

A history of abuse and/or neglect has also been associated with higher rates of aggression among children and adolescents (Smith & Thornberry, 1995). Those children and adolescents "who were physically abused were slightly more likely and those who were neglected showed the greatest increase in risk (Borum, 2000, p. 1264)". Overall, abuse and neglect accounted for a 40% increase in the chance of later criminality (Rivera & Widom, 1990).

Herrenkohl and Russo (2001) performed a longitudinal study of maltreated and nonmaltreated children from preschool age to school age in regard to their manifestation of aggression. They found that harshness of parenting at preschool age and severity of physical punishment at school age both relate to manifest aggression by those children when they are of school age.

Finzi, Ram, Har-Even, Shnit, and Weizman (2001) compared physically abused, neglected, and nonabused/nonneglected children from 6 to 12 years of age on their levels of aggression. They found that the physically abused children had significantly higher levels of aggression than their neglected or nonabused/nonneglected peers.

Fraser (1996) identified several factors in a home that contribute to the development of childhood aggression: inconsistent supervision, use of harsh punishment, failure to set limits, lack of rewarding positive social behaviors, and coercive parent-child interaction style. When these factors exist in a family, children learn that aggression

works. Parents also unintentionally train their children to use aggression as a means to achieve social goals. If a child models aggression and it is effective for them, they have effectively controlled the social exchange and it becomes rewarding for them. These children, who initiate aggression, think of physically coercive acts as socially effective and a normal, acceptable behavior.

Onyskiw and Hayduk (2001) wanted to find out if exposure to physical aggression in the family would affect the children's adjustment. They also wanted to differentiate between two mechanisms for this effect: observational learning and disrupted parenting (due to intrafamily aggression). This study was based in Canada and used a 20-year representative sample of children. They chose 3,014 children for the preschool sample, 5,553 children for the young school-aged sample, and 2,640 children in the older school-aged sample using four criteria to exclude: 1)children under four years of age 2)if the fathers were the parents interviewed 3)children living in foster care 4)children with serious chronic medical problems. This presented a sample with approximately equal numbers of boys and girls, with the subjects mainly living in two-parent homes, middle to upper middle SES, and mothers who had at least a high school education.

The results were as follows. The majority of children have low scores for physical and indirect aggression and internalizing behaviors but high scores for prosocial behaviors. When comparing the models for each of the age groups, all the models fit the data pattern well and showed that both the observational learning theory and the disrupted parenting theory provide some explanation for adverse effects on children. The aggressive models explained 25.5% - 33.6% of the variance in physical aggression,

15.1% - 26.9% of the variance in indirect aggression, 15% - 17.4% of the variance in internalizing behaviors, and 12.6% to 18.9% in prosocial behaviors for the children. The model that was most effective was for the older school-aged children. In summary, Onyskiw and Hayduk (2001) found that observational learning or modeling affects children's physical and indirect aggression in five of the six instances (listed above), however the effect was small.

Summary of Risk Factors

History of past aggression, family structure, exposure to violence, and abuse/neglect are all considered to be relevant constructs for the prediction of future aggressive acts. These variables can be misleading when research is to be conducted for several reasons. Since many youth are being admitted to treatment facilities for aggressive behavior, a report of aggressive behavior in the home, school, or society may not be predictive of how aggressive the youth will be in treatment, due to the very different nature of the inpatient unit (more structure and supervision) (Day, Franklin, & Marshall, 1998). Also, an exact degree or frequency of aggressive acts (both overt and covert) cannot be reliably obtained from parent or guardian report, so a systematic comparison between youth cannot be made. The same underreporting can occur for the risk factors of family structure, exposure to violence, and abuse/neglect. Since there is no way to objectively rate the degree of abuse/neglect, for example, we are unable to know if more severe forms lead to more severe forms of aggression. Hospitals are at a disadvantage in regard to the background information they are given about the adolescent. However, some factors that the hospital can reliably measure are available to researchers. These are within child variables, also termed clinical factors.

Clinical Factors used in Prediction

Blackburn (1983) questioned the validity to predicting aggression from a single trait measure because it is unlikely that a given behavior in any particular situation is a function of a single variable. However, a combination of traits can likely be more effective in predicting future behavior.

Diagnosis

The adult literature suggests a modest, but robust and significant relationship between a diagnosis of an Axis I mental disorder and violent behavior (Borum, 2000). This relationship has not been found in the child and adolescents samples. However, the underlying factors of impulsivity, hostility, and anger have been associated with aggression in children and adolescents (Minarik, Myatt, & Mitrushina 1997).

Inattention/Hyperactivity

In children and adolescents, attention problems and hyperactivity have shown to predict violence in childhood, adolescence, and adulthood (Borum, 2000). Current research has demonstrated that hyperactive children show higher rates of aggressive behavior and conduct problems in childhood and adolescence (Barkley, Fisher, Edelbrock, & Smallish, 1990; Loeber, Green, Keenan, & Lahey, 1995).

Brannigan et al (2002) also looked at levels of hyperactivity and its relation to aggression in their study of 13,067 4-11 year old children. They found that the top quarter of their sample, in terms of hyperactivity, corresponded with an increase of 541.4% in the misconduct scores, as rated by their parents.

Connor, Edwards, Fletcher, Baird, Barkley, and Steingard (2003) found that in 300 children with ADHD (mean age 10.7 yrs) rates of aggression, measured by the Child

Behavior Checklist, were found to increase as ADHD symptom severity increased. Early onset of ADHD was also correlated with a greater aggression score on the parent form of the CBCL.

Impulsivity, in the form of risk taking, has also been found to correlate with aggressive behavior in youth. Farrington (1989) found impulsivity to be associated with increased risk for violence. He also found that the construct of "risk-taking" [for example, a high score on the Sensation Seeking Scale of the Behavior Assessment Scale for Children – Self Report of Personality, (Reynolds & Kamphaus, 1998)] is more highly associated with aggression and violence than even personality. Hawkins, Herrenkohl, Farringon, Brewer, Catalano, and Harachi (1998) found that this particular construct almost tripled the risk for aggressive behavior among children and adolescents.

McMurran, Blair, and Egan (2002) studied 70 males' aggression and its relation to social problem solving and impulsivity. They found that higher impulsivity was related to lower social problem solving, while poorer problem solving was related to higher amounts of aggression. Crane-Ross, Tisak, and Tisak (1998) found in a sample of 398 adolescents who were engaging in aggressive behavior and conventional school rule violations that boys of higher aggressiveness reported more beliefs and values that were supportive of aggressive and rule-violating behaviors.

Nagin and Tremblay (2001) examined 4 different cohorts of boys (n = 1037) from 6 to 15 years of age. The cohorts were grouped by differing levels of aggressiveness and opposition in kindergarten, as rated by teachers. They found that having a teenage mother, low maternal education, household not intact, low IQ, high levels of

hyperactivity and inattention, and high opposition significantly distinguished group membership. They found no relationship between the fathers' level of education or SES.

Anger

Furlong and Smith (1998) noted "anger problems among youth may manifest themselves in a wide range of negative social, emotional, academic, and behavior outcomes including… high rates of aggressive behavior" (p.4). Novaco (1994) views anger as a "potent activator of aggression" (p.22). Difficulty in managing anger also has been associated with a higher risk of aggression in youth (Furlong & Smith, 1994). Furlong & Smith (1998) also note that anger among males is frequently expressed as verbal or physical aggression.

Cornell, Peterson, and Richards (1999) studied the validity of trait anger as a predictor or aggressive behavior among juvenile offenders (n = 65). They used two anger scales, the Novaco Anger Scales and the State-Trait Anger Expression Inventory. They found a .90 correlation between the NAS Part A and the STAXI Trait Anger score. In their prediction measures, they found a significant correlation between physical aggression and Trait Anger (r = .28), Anger-Out (r = .25), and Anger Control (r = -.38). Verbal aggression was significantly correlated with NAS Part A (r = .29), Trait Anger (r = .35), and Anger-Out (r = .33).

Summary of Risk Factors in Prediction Studies

As mentioned before, a combination of interpersonal variables, environment, and situation affect how a child will express aggression. In fact, Brannigan et al. (2002) found that the strongest effects in their study were individual variables (hyperactivity), followed by social history (hostile parenting), and situation (family structure). In other

words, "… a compilation of factors acts to either impel or restrain an individual with respect to the expression of violence" (Minarik, Myatt, & Mitrushina, 1997, p.279). Providing a safe, structured, consistent milieu is considered a cornerstone of adolescent inpatient treatment. Therefore, situational variables are kept relatively constant, providing a unique opportunity for studying within child variables that can contribute to aggressive behavior given the particular situation of inpatient treatment. Of particular importance to this study are self-report personality instruments, which can reliably measure the identified constructs of impulsivity, anger, and aggression.

Prediction Instruments

Self-Report Measures

Self-reports are important in prediction and prevention of aggression because "knowledge, attitudes, beliefs, and behavioral intentions frequently have an unknown or tenuous association with related risk behaviors" (Orpinas & Frankowski, 2001, p.52). Some research has argued that clinicians prefer accurate youth report when assessing internalizing disorders due to the fact that the youth will have direct access to feelings, as opposed to the parent having to make an inference. Also, educational factors and psychopathology of the parent can also adversely affect the accuracy of their ratings (Danielson, Youngstrom, Findling, & Calabrese, 2003).

However, many researchers have questioned the validity of youth self-reports of delinquent or aggressive behavior. Before disproving this in their study, Thurber and Hollingsworth (1992) hypothesized that the validity of self-reports may be affected by social desirability, the failure of the adolescent to attempt to comprehend the question or

spend enough time pondering the question before answering, or limited ability to understand the question due to inadequate academic skills.

Moffit (1996) challenges this, stating that "40 years of research counters with evidence that such self-reports are trustworthy, when collected under certain conditions" (p.33). These conditions are: a period less than 12 months for reporting, a private face-to-face interview, and a convincing guarantee that their responses will be held confidentially. In fact, Moffitt continues by explaining that in her research (Moffitt, Caspi, Silva, & Stouthamer-Loeber, 1995), relations between impulsivity and antisocial behavior are consistent across gender and race, whether they are measured by self-reports, parent CBCL, teacher CBCL, or court records.

In developing the Aggression Scale, Orpinas and Frankowski (2001) found that not only were the self-reported aggression scores stable in a 2-year follow up study, but the mean scores on the Aggression Scale were associated positively with teacher ratings and observational data.

In fact, self-reports of traits, such as psychopathy, may be able to provide better insight into subjective dispositions that would be more difficult for untrained observers to assess, such as a parents or teachers. Additionally, self-report measures can be administered quickly, even in a group format, resulting in saving time and money with large samples (Andershed, Gustafson, Kerr, & Stattin, 2002).

Personality Measures

Minarik, Myatt, and Mitrushina (1997) suggest that since little research on youth personality profiles and their relation to violent behavior has been reported in the literature, "a basic personality profile would seem the likely foundation upon which

various other known factors could be considered in an effort to better identify and describe the at-risk adolescent" (p.280).

Minarik, Myatt, and Mitrushina (1997) tested this theory with suicidal adolescents using the Adolescent Multiphasic Inventory. They found that the suicidal group of adolescents were differentiated from the violent adolescents. The suicidal group had significantly higher scores than did the violent group on five scales (Hypochondriasis, Psychasthenia, Paranoia, Schizophrenia, and Social Introversion).

Loper, Hoffschmidt, and Ash (2001) studied the relationship between characteristics of recent violent events and personality features measured by the Million Adolescent Clinical Inventory (n = 82). They found that the Psychopathy Content scale correctly distinguished youth above the sample median on instrumental aggression and lover the median for empathy/guilt after the act from their peers in 79.8% of the cases, with a sensitivity of 75%, specificity of 82%, positive predictive value of 68%, and negative predictive value of 86%.

Perhaps an even better approach is to "… identify phenomenological profiles or patterns across variables that experts have deemed important for discriminance among clinical subtypes… these empirically based typologies often employ cluster analysis to identify patterns of reported problems existing within a given population…"(Furlong & Smith, 1998, p.231). Edelbrock and Achenbach (1991) developed a classification system for behavior problems in children specifically for this purpose, called the Child Behavior Checklist (Furlong & Smith,1998).

Youth Self Report

The Child Behavior Checklist (CBCL) and the Youth Self report (YSR) are two of the most popular measures used to assess symptomology and functional status of psychiatric youth. These scales are used as outcome measures across the country, including sites funded by the Center for Mental Health Services as part of the Children's Mental Health Initiative. (Rosenblatt & Rosenblatt, 2002) In particular, the YSR is easy to administer and is widely used to indicate psychological problems in various populations (Morgan & Cauce, 1999).

The YSR has been found to have significant associations between DSM-III diagnoses, obtained by the Diagnostic Interview Schedule for Children (DISC), for adolescents (n = 160) diagnosed with behavior disorders (in relation to the Externalizing Scale). In a similar study, among 145 adolescents, a significant correlation was found between the Delinquent Scale and a diagnosis of Conduct Disorder (Morgan & Cauce, 1999).

In Morgan & Cauce (1999) the YSR was given to adolescents (n = 230) and comparisons were made for the YSR scales and the adolescents' diagnosis. Using a discriminant analysis, the researchers found significant functions for each of the diagnoses they studied. Of importance to this study, high YSR scores on Aggressive Behavior and Delinquent Behavior predicted a diagnosis of oppositional defiant or conduct disorder; high YSR scores on Attention Problems and Aggressive Behavior predicted a diagnosis of ADHD. In their results section, the researchers explain that the YSR may provide an economical and useful clinical screening tool.

Thurber and Hollingsworth (1992) studied 102 (52 boys, 50 girls) adolescents in a private psychiatric hospital, giving them a variety of self-report measures, including the YSR. They found that the YSR Internalizing and Externalizing scales converge as expected with compatible self-report measures (California Psychological Inventory, Beck Depression Inventory, Hopelessness Scale for Children). They argued that the adolescents could be maximally distinguished between rule-abiding versus impulsive and antisocial. They suggested that the girls, more than boys, were prone to "faking good".

The Child Behavior Checklist (CBCL) was designed by Achenbach and Edelbrock to evaluate problem behaviors and social competencies in children. There are two forms of the CBCL and other supplemental forms, including the Teacher Report Form (TRF), the Direct Observation Form (DOF), and the Youth Self-Report (YSR). All forms are paper and pencil, multiple choice and free-response inventories. The CBCL assesses the child from the parents' point of view, the TRF assesses the child's behavior while they are in the classroom, the DOF uses observational data, and the YSR obtains self-report data directly from the child (Lowe, 1998). The CBCL was normed on a sample of 2,368 children in 48 states, with regard for ethnicity, SES, and urban-suburban-rural residence.

Achenbach and Edelbrock (1983) assessed the test-retest reliability, interrater agreement, and long-term stability of the CBCL. Test-retest reliability was found to be .952 for behavior problems and .996 for social competence items (.74 over a three month period); inter-interviewer reliability was found to be .959 for behavior problems and .978 for the social competence items completed by mothers and fathers.

Achenbach and Edelbrock (1983) also assessed the validity of the CBCL. Construct validity was demonstrated by a .91 total problems correlation between the CBCL and the Conners Parent Questionaire and .92 with the Quay-Peterson Revised Behavior Problem Checklist. Criterion validity was established through demonstrating that 116 out of 118 of the behavior problems items and all of the social competence items significantly discriminated referred from nonreferred children. Concurrent validity was demonstrated through as .85 correlation between the Conners Revised Teacher Rating Scale and the CBCL.

The CBCL is often considered the standard against which other child psychopathology instruments are measured. The Achenbach System of Empirically Based Assessment website (ASEBA, 2002) reports that over 4,500 published studies have utilized the CBCL in their research.

The YSR is designed to obtain adolescents' (11-18 years of age) reports of their competencies and problems, using a standardized format. Since the adolescent has a unique knowledge and perspective of their behavior and emotions, they are seen as important contributors to the assessment process. The youth is asked to rate themselves based upon the last 6 months. It is suggested that the youth be assured of confidentiality and the administrator of the YSR should be available to answer questions about items. The structured items usually take about 15 minutes to complete (Achenbach, 1991).

The YSR is written on a fifth grade reading level, but can be administered orally if questions about the youth's ability to read are present. On pages 1 and 2 of the YSR are the competence items (sports, hobbies, demographic information). On page 2 are open-ended items for adolescents to describe illnesses, disabilities, concerns, and positive

things about themselves. On pages 3 and 4 of the YSR are the 112 problem items. The youth responds with a score of 0 (not true), 1 (somewhat or sometimes true), or 2 (very true or often true). On several problem items the adolescent is asked to describe the problem in question to give the user more information about the specific content of the problem that the adolescent is reporting (Achenbach, 1991).

For the YSR, test-retest reliabilities (1 week) were .79 for Attention Problems, .72 for Delinquent Behavior, .79 for Aggressive Behavior, .80 for Internalizing, .81 for Externalizing, and .79 for Total Problems. The mean r for all scales was .72. The mean change in scores was 0.8 over the 1-week period (Achenbach, 1991). A more recent study by DeFranscesco, Armstrong, and Russolillo (1996) found an r = .97 for the 1-week test-retest reliability for self-reports in a sample of 50 delinquent youth from a state juvenile detention facility.

Criterion-related validity was determined by significantly higher scores of referred youth on 95 of the 101 problem items that reflect the total problems score (Achenbach, 1991). The YSR has been found to have moderate correlations with the Depression Self Rating Scale (DSRS). The DSRS total scores and YSR total scores had a correlation of .56 (Ivarsson, Gillberg, Arvidsson, & Broberg, 2002).

Convergent validity of select scales of the MMPI and YSR were examined by Belter and Foster (1996). Utilizing a sample of 188 adolescent psychiatric inpatients, a significant correlation between scores on the MMPI scale 4 and the YSR Aggressive Scale was found for the male sample (r=.49).

Measurement of Impulsivity/Delinquency/Aggression using the YSR

The YSR Revised School-Age Forms contains a syndrome scale that is of particular importance to this study. The Aggressive Behavior scale measures verbal and physical aggressiveness and contains 17 items (Achenbach, 2001). Also included in this revision of the YSR are six DSM-Oriented Scales. The two DSM-Oriented Scales of importance to this study are the Attention Deficit/Hyperactivity Problems (7 items) and Conduct Problems scales (15 items) (Achenbach, 2001).

Measurement of Anger

Adolescent Anger Rating Scale

The Adolescent Anger Rating Scale (AARS) was developed by DeAnna Burney in 2001. It is a 41 item, self report measure that utilizes a 4-point Likert-type rating scale (Hardly Ever to Very Often). The AARS is designed to identify adolescents' (ages 11 to 19) typical modes of anger expression and anger control. It is written on a 4th grade reading level and can be administered to individuals in just 5 to 10 minutes or to groups in 10 to 20 minutes.

The AARS measures instrumental anger, reactive anger, and anger control. It was normed using a sample of 4,187 adolescents. Normative data are provided for boys and girls in middle schools and high schools.

Burney and Kromrey (2001) investigated the construct validity of the AARS scores utilizing a sample of 792 adolescents, ranging from 12 to 19 years of age (Grades 7 to 12). Using the principal axis factor method, they found three factors with prerotational eigenvalues ranging from 1.0 to 5.5. The first factor contained 8 items and was identified as Instrumental anger. These items were designed to measure "anger

patterns that are planned over a period of time and typically result in intensive violent and malicious attacks on people, places, or objects" (p.447).

The second factor contained 5 items and was identified as Anger Control. This construct measures the "ability to demonstrate proactive behaviors when responding to anger provocations" (Burney & Kromrey, 2001, p.447). The third factor contained 3 items and was identified as Reactive Anger, which was "designed to measure responses that are immediately externalized (i.e., hitting, yelling) by the individual" (p.447). Overall, the eigenvalues for the rotated factors were 4.25 for Instrumental Anger, 3.31 for Anger Control, and 3.96 for Reactive Anger (Burney & Kromrey, 2001).

Reliability of the AARS was assessed using estimates of internal consistency and the stability of AARS scores. The coefficient alphas for the 16-item revision was .83 for Instrumental Anger, .70 for Reactive Anger, and .80 for Anger Control. The test-retest reliability over a two-week interval (155 participants) resulted in Pearson product moment coefficients of .58 for Instrumental Anger, .69 for Reactive anger, and .65 for Anger Control. This is higher than the test-retest correlation of a commonly used measure of anger, the Multidimensional Anger Inventory (MAI), which had scored a .36 (Burney & Kromrey, 2001).

A confirmatory factor analysis using maximum likelihood estimation was performed using the 16 identified items. Burney and Kromrey (2001) found that the "goodness-of-fit index was .92 with a $\chi 2$ value of 270.03 with 101 degrees of freedom ($p < .0001$). The adjusted goodness-of-fit index (AGFI) value was .89, and the parsimonious GFI represented an acceptable fit with a value of .77. The value of the root mean-square error of approximation was .08, which is also in the acceptable range. The

nonnormed and normed fit indices were .91 and .88, respectively. Finally, the parameter estimates were all above .30 (ranging from .57 to .70 for Reactive Anger, .37 to .78 for Instrumental Anger, and .38 to .83 for Anger Control)" (Burney & Kromrey, 2001).

Overall, the researchers suggest that this is a useful measure for examining anger in adolescents. Three factors (Instrumental Anger, Reactive Anger, and Anger Control) have been identified through their instrument that can be used as important measures of the latent construct of anger (Burney & Kromrey, 2001). These specific constructs may be of importance for the inpatient adolescent population, and this study in particular.

Outcome Measures for Aggression

Overt Aggression Scale

The Overt Aggression Scale (OAS) was developed by Yudofsky, Silver, Jackson, Endicott, Williams (1986) to assess observable aggressive or violent behavior rather than tendencies. The OAS was designed specifically for use with child and adult (9 years and up) psychiatric patients. It is a one-page form composed of two parts. The first section contains 4 categories: Verbal Aggression, Physical Aggression Against Objects, Physical Aggression Against Self, and Physical Aggression Against Other People. In each category, aggressive behavior is rated according to severity. The second part of the scale, of little consequence to this study, rates staff intervention in response to aggressive incidents.

Yudofsky et al. (1986) saw a need for a relatively easy to complete, objective rating scale to differentiate patients with chronic hostility versus those who only have episodic aggressive outbursts. Inter-rater reliability was tested on the Children's Psychiatry Service at New York State Psychiatric Institute. The intraclass correlation

coefficients for 11 of the items were greater than .75, nine items were from .50-.75, and one had less than .50. The total aggression score, which represents "the sum of the weighted scores for the most severe of each type of behavior and the most restrictive intervention, had a correlation coefficient of .87" (Yudofsky et al., 1986, p.36).

Kafantaris, Lee, Magee, Winny, Samuel, Pollack, and Campbell (1996) studied 16 conduct-disordered children in an inpatient unit who were being administered different psychotropic medications. Their aggressive behavior was measured using the OAS for 3 to 19 weeks. They determined that the OAS took into account aggressive behaviors better than did the progress notes and it appropriately reflected the events and severity of aggressive incidents. They found that the OAS is an appropriate measure for children since it captured the aggressive incidences well, had good agreement with another measure of observable aggression (the Children's Psychiatric Rating Scale), and reflected change in aggressiveness in the drug treatment study.

Kafantaris et al. (1996) suggest that the OAS is a good measure for use on a 24-hour basis, since some children may display less aggression during the day and more during the afternoon or evening hours. Also, acts of aggression may not occur specifically during the time periods designated for frequency counts.

The OAS is considered "the grandfather of all research tools in this area" (Bowers, 1999, p.340). Researchers have made modifications to the OAS, resulting in the Modified Overt Aggression Scale (MOAS) (Kay, Wolkenfield, & Murrill, 1988), the Retrospective Overt Aggression Scale (ROAS) (Sorgi, Ratey, Knoedler, Markert, & Reichman, 1991), and the Overt Aggression Scale – Modified (OAS-M) (Coccaro, 1991). The OAS-M is a clinician administered, semi-structured interview used for outpatients.

Therefore, it will not be discussed. However, the MOAS and the ROAS are of practical use for this study.

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The ROAS (Sorgi et al., 1991) is a retrospective adaptation of the OAS, obtained weekly. The 16 types of aggressive behavior were transformed into 16 scale items. The frequency of occurrence is rated on a five-point Likert scale (Paxton & Anslow, 1997). Sorgi et al. (1991) used the ROAS to obtain weekly ratings of aggressive behavior for 12 patients over 16 weeks and in another study where they followed 2 to 8 patients a week for 14 weeks. The ROAS demonstrated acceptable validity and interrater reliability (Pearson r correlation of .96 and Cronbach's alpha coefficient of .75), however aggressive behavior was slightly underreported compared to OAS reports (Sorgi et al., 1991).

Bowers (1999) reported some advantages to using the MOAS and ROAS. The first is that the information is easy to collect and does not require a large commitment from unit staff, since interviews of staff plus information from records can be used. He also reports that the MOAS and ROAS both have good inter-rater reliability (.85-.94 and .96 respectively). He adds that the ROAS has good concurrent validity with the OAS,

Nurses Observation Scale for Inpatient Evaluation (.85-.96), and the Brief Psychiatric Rating Scale (.70-.85).

CHAPTER III

METHODOLOGY

Participants

Participants included 87 adolescents admitted to Tulsa Regional Medical Center's adolescent inpatient psychiatric units. Demographic characteristics of the participants are shown in Table 1. The sample included 49 females (56.3%) and 38 males (43.7%). The adolescents ranged from 11 to 17 years of age, with the average age being 14.33 years (1.6 SD). In addition, the racial makeup of the participants was as follows: Caucasian 82.8% (n=72), African American 14.9% (n=13), Hispanic 1.1% (n=1), and Native American 1.1% (n=1).

Table 1
Characteristics of Participating Adolescent Inpatients

Characteristic		n	Percent
Gender	Male	38	43.7
	Female	49	56.3
	Total	87	100.0
Race	Caucasian	72	82.8
	African-American	13	14.9
	Hispanic	1	1.1
	Native American	1	1.1
	Total	87	100.0
Age	11	1	1.1
	12	13	14.9
	13	13	14.9
	14	20	23.0
	15	20	23.0
	16	9	10.3
	17	11	12.6
	Total	87	100.0

Mean Age = 14.33 Standard Deviation=1.597

Participants were recruited from Children's Medical Center Behavioral Health Services (CMC-BHS), which provides pediatric and adolescent inpatient acute/residential behavioral health services. Treatment programs include comprehensive, patient focused psychiatric treatment for sexual abuse, anxiety, ADHD, oppositional behavior, drug and alcohol abuse/dependence, and mood disorders. Children's Medical Center Behavior Health Services is located within Tulsa Regional Medical Center (TRMC), a 415-licensed bed acute care hospital located near downtown Tulsa at 744 W. 9th Street. Tulsa Regional Medical Center is a teaching hospital affiliated with Oklahoma State University College of Osteopathic Medicine (OSUCOM). CMC-BHS has three full-time psychiatrists, 2

pediatricians, and 6 therapists providing care to the patients. There is a 4:1 ratio of nursing staff on the units during the 7-3 and 3-11 shifts.

CMC-BHS is an inpatient child and adolescent psychiatric facility, with 14 child beds dual licensed for the acute/residential levels of care and 50 adolescent beds dual licensed for the acute/residential levels of care. There are four units: Adolescent Acute, Adolescent Residential, Early Adolescent Unit, and Children's Unit. The Adolescent Acute Unit (AAU) typically serves up to 15 adolescents from 12 to 18 years of age, while the Adolescent Residential Unit (ARU) typically serves up to 18 adolescents from 12 to 18 years of age. The Early Adolescent Unit (EAU) serves children/adolescents from 9 to 14 years of age, while the Children's Unit (CU) serves up to 14 children from 2 to 11 years of age. Three units were targeted for this study, because of their adolescent population; the AAU, ARU, and EAU. The Children's Unit was excluded from this study.

Instrumentation

Independent Variables

Impulsivity, Aggression, and Oppositional Behavior

The Child Behavior Checklist Youth Self Report (YSR) is a 112-item questionnaire designed to obtain adolescents' (11-18 years of age) reports of their competencies and problems, using a standardized format. Because the adolescent has a unique knowledge and perspective of his or her behavior and emotions, he or she is seen as an important contributor to the assessment process. The youth is asked to rate him/herself based upon his or her recall of the last 6 months. The youth is assured of

confidentiality and the administrator of the YSR should be available to answer questions about items. The structured items take about 15 minutes to complete (Achenbach, 1991).

The YSR is written on a fifth grade reading level, but can be administered orally if there are questions about the youth's ability to read. The competence items (sports, hobbies, demographic information) are located on pages 1 and 2 of the YSR. On page 2 are open-ended items for adolescents to describe illnesses, disabilities, concerns, and positive things about themselves. The 112 problem items of the YSR are located on pages 3 and 4. The youth responds with a score of 0 (not true), 1 (somewhat or sometimes true), or 2 (very true or often true). On several problem items the adolescent is asked to describe the problem in question to give the user more information about the specific content of the problem that the adolescent is reporting (Achenbach, 1991).

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Anger

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The second factor contained 5 items and was identified as Anger Control. This construct measures the "ability to demonstrate proactive behaviors when responding to anger provocations" (Burney & Kromrey, 2001, p.447). The third factor contained 3 items and was identified as Reactive Anger, which was "designed to measure responses that are immediately externalized (i.e., hitting, yelling) by the individual" (p.447). Overall, the eigenvalues for the rotated factors were 4.25 for Instrumental Anger, 3.31 for Anger Control, and 3.96 for Reactive Anger (Burney & Kromrey, 2001).

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A confirmatory factor analysis using maximum likelihood estimation was performed using the 16 identified items. Burney and Kromrey (2001) found that the "goodness-of-fit index was .92 with a $\chi 2$ value of 270.03 with 101 degrees of freedom ($p < .0001$). The adjusted goodness-of-fit index (AGFI) value was .89, and the parsimonious GFI represented an acceptable fit with a value of .77. The value of the root mean-square error of approximation was .08, which is also in the acceptable range. The nonnormed and normed fit indices were .91 and .88, respectively. Finally, the parameter

estimates were all above .30 (ranging from .57 to .70 for Reactive Anger, .37 to .78 for Instrumental Anger, and .38 to .83 for Anger Control)" (Burney & Kromrey, 2001).

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Historical Factors

The last independent variable included was an informal descriptive instrument designed by the researcher. Historical variables that could influence the development of aggression in adolescents were examined through the use of the Clinical Interview Form (Appendix A). In a yes/no format, the adolescents were asked if the following historical factors were present in their past: 1) Demonstrative aggression (destruction of property) 2) Physical aggression 3) Verbal aggression 4) Living in an intact household 5) Suffering Abuse/Neglect 6) Witnessing the abuse of a family member.

Dependent Variables

The Retrospective Overt Aggression Scale or ROAS (Sorgi et al., 1991) is a retrospective adaptation of the Overt Aggression Scale (Yudofsky et al., 1986), obtained weekly. The OAS and ROAS were designed to assess observable aggressive or violent behavior rather than tendencies. The ROAS was designed specifically for use with children and adult (9 years and up) psychiatric patients. The first section contains 4 categories: Verbal Aggression, Physical Aggression Against Objects, Physical

Aggression Against Self, and Physical Aggression Against Other People. In each category, aggressive behavior is rated according to severity.

The 16 types of aggressive behavior were transformed into 16 scale items. The frequency of occurrence is rated on a five-point Likert scale (Paxton & Anslow, 1997). The ROAS delivers a Total Aggression Score as well as several subtest scores: Verbal Aggression, Physical Aggression Against Other People, and Physical Aggression against Objects.

Yudofsky et al. (1986) saw a need for a relatively easy to complete, objective rating scale to differentiate patients with chronic hostility versus those who only have episodic aggressive outbursts. Inter-rater reliability was tested on the Children's Psychiatry Service at New York State Psychiatric Institute. The intraclass correlation coefficients for 11 of the items were greater than .75, nine items were from .50-.75, and one had less than .50. The total aggression score, which represents "the sum of the weighted scores for the most severe of each type of behavior and the most restrictive intervention, had a correlation coefficient of .87" (Yudofsky et al., 1986, p.36).

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The ROAS (Sorgi et al., 1991) is a retrospective adaptation of the OAS, obtained weekly. The 16 types of aggressive behavior were transformed into 16 scale items. The

frequency of occurrence is rated on a five-point Likert scale (Paxton & Anslow, 1997). Sorgi et al. (1991) used the ROAS to obtain weekly ratings of aggressive behavior for 12 patients over 16 weeks and in another study where they followed 2 to 8 patients a week for 14 weeks. The ROAS demonstrated acceptable validity and interrater reliability (Pearson r correlation of .96 and Cronbach's alpha coefficient of .75), however aggressive behavior was slightly underreported compared to OAS reports (Sorgi et al., 1991).

Bowers (1999) reported some advantages to using the MOAS and ROAS. The first is that the information is easy to collect and does not require a large commitment from unit staff, since interviews of staff plus information from records can be used. He also reports that the MOAS and ROAS both have good inter-rater reliability (.85-.94 and .96 respectively). He adds that the ROAS has good concurrent validity with the OAS, Nurses Observation Scale for Inpatient Evaluation (.85-.96), and the Brief Psychiatric Rating Scale (.70-.85).

For the purpose of this study, the ROAS was utilized using two separate sources of information. The first source was identified and trained shift staff who completed the ROAS on each youth in the study as the measure was designed. The second source of information was the primary investigator, who was checked for accuracy by another trained intake counselor (as will be explained in the procedures below). The second method involved coding behavioral information on the ROAS gathered from youth file records documented by nursing staff on the CMC-BHS Unit Measures.

The first of the CMC-BHS Unit Measures was the 30-minute check sheet. This is an interval recording observational form designed to help unit staff document where each

adolescent is located during each 30-minute period of the day. While it typically is used to denote physical location within the hospital (e.g. patient room, day room, dining area, bathroom), it also allows for major incidents that might have required seclusion or restraint to be documented. The second unit measure was the daily behavior point card. Unit staff document youth behaviors for each 30-minute interval of their shift. Overall quality of behavior is rated for that time period from 0 points to 3 points, with zero denoting behaviors that are gross program rule violations and 3 denoting behaviors that are above expectations for prosocial behavior. In addition to the rating, staff note the specific behaviors during that 30-minute interval that led to the specific numerical rating. For example, if a youth earned a 0 rating for a particular 30-minute interval, staff would list the specific behaviors the youth exhibited such as cursing, threatening, or hitting. The final unit measures that were utilized were the shift progress notes. Progress notes are filled out by unit staff for each youth on the unit and are placed into the youth's permanent hospital record (the 30-minute check sheet and daily behavior point cards are not part of the permanent file). The progress notes serve as a narrative description of the youth's behavior during that particular shift. The progress reports describe in detail maladaptive behaviors which had been listed for each participant.

Procedure

Intake counselors were trained by the primary investigator regarding recruitment of subjects at a monthly intake staff meeting as well as two 30 minute individual training sessions for each of the intake counselors before the launch of the study. The purpose of the study was fully explained to each, and the consent form was examined in detail. The intake counselors also practiced explaining the study to the primary investigator as well

as to the charge nurses so that if the intake counselors were unavailable for further questions by parents/guardians, the charge nurse would be knowledgeable about the study and would be able to refer them to the primary investigator. Intake counselors completed the TRMC Staff Consent Form (see Appendix B), indicating their willingness to participate.

One intake counselor volunteered to assist with checking the reliability of ratings obtained by the primary investigator gathered from the CMC-BHS unit measures: 30-minute check sheets, daily behavior point cards (30 minute intervals), and progress notes (staff narratives), which are completed at the end of each shift for each adolescent. The primary investigator and assistant took two randomly selected adolescent charts twice per week for a month. The primary investigator and assistant would each separately look through the adolescent's behaviors of the past week and compare the resulting ROAS ratings. By the end of this training period, the research assistant was trained to a reliability standard of 96%.

Direct care staff, or psychiatric technicians, were also trained for the purposes of the study. On each shift in which the participants were involved in treatment, the 7am-3pm and 3pm-11pm shifts, the lead psychiatric technician for each adolescent unit was solicited to participate in the study. The lead psychiatric technicians were chosen due to their higher seniority within the program and their supervisory role toward other direct care staff. Because lead psychiatric technicians only work on Monday through Friday for their set shift and unit, one weekend option psychiatric technician (staff members who work 7am-11pm on both Saturday and Sunday) for each adolescent unit was also solicited to participate. This led to the identification and participation of 3 psychiatric

technicians per unit, so that all treatment hours of the units would be monitored for the purposes of the study.

At a monthly psychiatric technician meeting, the study was explained to the identified staff members, as well as other psychiatric technicians. All solicited agreed to participate in the study and completed the TRMC Staff Consent Form. At this point, the group was trained on how to use the Retrospective Overt Aggression Scale (ROAS). Each behavioral category within the ROAS was operationally defined. In the month between TRMC IRB approval and OSU IRB reapproval and subsequent initiation of the study, biweekly training visits were made to each of the adolescent units. During these training sessions, participating staff and the primary investigator observed randomly identified adolescents for one hour blocks. At the end of the time period, the staff members and the primary investigator compared ratings using the ROAS. By the end of the month long training, staff members had reached a reliability standard of 92% agreement with the primary investigator.

After the training and IRB process was complete, the study began. When an adolescent (age 11 – 17) completed the intake process, and was admitted to the unit, the intake counselor introduced the study to the parent/guardian of the adolescent and explained the Informed Consent/Assent Form (Appendix C). Patients were excluded from the study if they were reported to have intellectual functioning in the mentally retarded range, were actively psychotic, were not able to verbally communicate, were deaf, or failed to give assent. Once written consent of the parent/guardian was obtained, the parent/guardian received a copy of the signed consent form. The original consent

form was then placed in a secure location within the intake office and was acquired by the primary investigator.

Per unit policy, direct care and nursing staff monitored the admitted adolescents' behavior through the use of CMC-BHS unit measures: 30 minute check sheet, daily behavior point card, and progress notes. Within three days of admission, the principal investigator explained the study to the adolescent participant: the risks involved, procedures to be used, time commitment involved, and ensured confidentiality. It was explained that the information collected would not be available to the youths' parents, staff members (excluding the primary investigator), or the administration of Children's Medical Center – Behavioral Health Services. It was also explained that there is no connection between participation in this study and the treatment they would receive at CMC-BHS, and their confidentiality and anonymity within this facility would be protected. Also, they were informed that if they choose to not participate in the study, no documentation indicating this decision would be placed in their file nor would they be penalized in any way regarding their treatment at CMC-BHS. They were informed that they could withdraw from the study at any time, also without penalty. However, each adolescent asked to participate was offered their choice of an item from the each of the vending machines (soda and candy) at the completion of his or her participation. Adolescent assent was obtained and documented using the original Informed Consent/Assent Form signed by their parent/guardian before any other data was collected. All adolescents whose caregivers agreed to participate in the study also gave their assent.

After the Informed Consent/Assent form was signed by the parent/guardian and adolescent, the primary investigator assigned the adolescent an identification number. From that point on, data obtained regarding the patient, for the uses of this study, were coded by the particular identification number given to that participant. All data that could identify the adolescent or parent/guardian were kept in secure storage. At the end of the collection period, all identifying data (participant consent forms) collected for the purposes of this study were destroyed via a document shredder and disposed of through the hospital incinerator. All other data (protocols, interview forms, and non-identifying information) will be kept for the mandatory 3 year period. These steps were explained during the consent/assent process and are detailed in the consent/assent form as well. No report of any type and no publication resulting from this research will identify the participants by name, birth date, or any other identifying information.

Once consent and assent were obtained, the adolescent was read the Youth Self Report and Adolescent Anger Rating Scale to ensure understanding of the items. The historical variables were obtained from patient report and documented using the Clinical Interview Form.

A folder and checklist was set up for each participating psychiatric technician, and placed in his or her mailbox. This ensured that each staff member had the appropriate forms to fill out for each adolescent in the study. The ROAS was filled out every seven days for each adolescent participating in the study (for their individual 2 week period). The psychiatric technicians for each shift/unit filled out the Retrospective Overt Aggression Scale (ROAS) to obtain their ratings (hereby referred to as Staff ROAS ratings) of the participants' aggressive behaviors. To provide another comparison, the

primary investigator coded the adolescents' behaviors using the CMC-BHS unit measures, transferring the behaviors to the ROAS (hereby referred to as Chart ROAS ratings). To ensure reliability of these chart ROAS ratings, every fourth subject (21 subjects in total or 24%) was checked for interrater reliability by the previously mentioned assistant.

Data were only collected for the adolescents' first 14 days of treatment. After 14 days, the adolescent's participation in this study was considered over, and no further data were collected. At the end of each adolescent's participation they were debriefed about the study and any questions they had about the nature of the study were answered.

CHAPTER IV

RESULTS

This study examined the utility of self-reported perceptions of behavior (YSR & AARS) as well as the presence of historical factors associated with the development of aggression in adolescents to predict actual aggressiveness of adolescent inpatient youth on a psychiatric ward. The ROAS Staff and ROAS Chart ratings of Total Aggression, Verbal Aggression, Aggression Against Objects, and Aggression Against Persons were used as the dependent variables to determine differences between the actual level of aggressive behavior exhibited by the adolescents in the study. The Statistical Package for the Social Sciences version 12.0 (SPSS, 2003) was used to conduct statistical analyses of the data.

Of the 87 participating adolescents in the study, 82 reported the presence of at least one of the Historical Factors (94.3%), while only 9 indicated the presence of all Historical Factors (10.3%). The Historical Factors' presence was relatively evenly endorsed, with a slight majority of participants endorsing a history of Destruction of Property (58.6%) as well as in Witnessing the Abuse of a Family Member (54%). Slight minorities of participants reported the factors of Physical Aggression (48.3%), Verbal Aggression (46%), Living in an Intact Household (43.7%), and Being the Victim of Abuse or Neglect (46%).

Table 2
T-score means and standard deviations for the YSR and AARS scales

Instrument	Subscale	Mean	Std. Deviation
Youth Self Report (YSR)			
	Anxious/Depressed	64.56	10.46
	Withdrawn/Depressed	64.82	11.81
	Somatic Complaints	60.53	11.70
	Social Problems	62.06	9.93
	Thought Problems	66.60	11.73
	Attention Problems	65.64	11.49
	Rule-breaking Behavior	69.18	9.91
	Aggression	69.28	12.01
	Internalizing Problems	63.82	11.04
	Externalizing Problems	69.67	10.44
	Total Problems	68.26	10.37
	Affect Problems	67.09	9.81
	Anxiety Problems	59.33	8.21
	Somatic Problems	58.53	11.70
	ADHD	63.51	8.43
	ODD	66.22	9.24
	Conduct Problems	71.41	10.69
Adolescent Anger Rating Scale (AARS)	Instrumental Anger	58.22	13.86
	Reactive Anger	58.10	10.90
	Anger Control	46.72	10.39

Table 2 shows that the highest T-scores on the YSR were Conduct Problems, Externalizing Problems, Aggression, and Rule-Breaking Behavior. However, the mean for the sample indicates that the adolescents in the study are reporting clinically significant problems in a wide range of domains measured by the YSR. T-scores on the AARS were lower in comparison, with relatively equal means on the Instrumental Anger and Reactive Anger subscales. The mean for Anger Control was within the average range.

The dependent variables of ROAS Total Aggression, Verbal Aggression, Physical Aggression Against Objects, and Physical Aggression Against Persons, as explained in

the methods section, were obtained from both staff direct report and through chart review and historical records found within the youths' file. Each of these ROAS ratings are reported in the following table. The means and standard deviations of both ratings obtained from staff observations as well as information gathered from the adolescents' charts are reported.

Table 3
Staff and Chart ROAS Ratings

Source of Rating	Subscale	Mean	Std. Deviation
Staff Report			
	Verbal Aggression	9.75	13.49
	Physical Aggression Against Objects	1.98	4.15
	Physical Aggression Against Others	1.30	3.66
Total Staff Aggression		13.02	18.82
Chart Content			
	Verbal Aggression	5.13	7.59
	Physical Aggression Against Objects	.52	1.35
	Physical Aggression Against Others	1.05	2.94
Total Chart Content		6.69	10.28

Upon visual inspection of Table 3, it is apparent that the mean for Verbal Aggression was much higher than the other subscales on both the Staff report and Chart ratings. To determine which of the dependent variable ratings would be most appropriate to use, the relationships between all of the dependent variables, staff and chart ratings of the adolescents' aggression, were examined.

Table 4
Correlations between the Staff and Chart ROAS ratings

	Chart ROAS		
	VA	PO	PP
Staff ROAS			
VA	.831	.424	.400
PO	.701	.630	.504
PP	.328	.349*	.583

Note. - * Significant at the p=.002 level. All other correlations were significant at the $p \leq 0.001$ level. VA = Verbal Aggression, PO = Aggression against property, PP = Aggression against persons

The relationships among the dependent variables were all significant ($p \leq .001$), except for Chart ROASPO and Staff ROASPO, which was significant at the p=.002 level. However, after examining the dependent variables the usefulness of the chart ratings was questioned. Although the correlations between the subscales on the staff ROAS ratings and chart ROAS ratings were significant, 5 more adolescents were given ratings of zero aggression on the Chart ROAS versus those reported on the Staff ROAS. The number of adolescents rated as having zero aggression by the Staff ROAS report were 38 (43.7%) of the 87 total adolescents, while the number of adolescents with no aggressive behaviors gathered from the Chart ROAS were 43 (49.4%) of the 87 total adolescents. In addition, there was a large difference between the mean scores of the two sources of information. It is surmised that meaningful observational data was not transcribed to the unit measures and charts by treatment staff not involved in the study. Therefore, the staff ratings of aggressive behavior were believed to be the best representation of the actual aggressive behaviors exhibited by the adolescents in the study and was used by the primary investigator for the purposes of the following statistical analyses.

To examine whether or not the identified Historical Factors, YSR Subscales, and AARS Subscales were predictive of aggressive behaviors exhibited by youth in the study, a series of step-wise multiple regression analyses were utilized. Table 5 summarizes the regressions.

Table 5
Regressions Predicting Staff Ratings of Aggression

	R	R^2	R^2 change	B	β	Overall F	P
Total Aggression							
Steps/Predictors							
AARSRA	.225	.051	.040	.389	.225	4.548	.036
Verbal Aggression							
Steps/Predictors							
HF4	.211	.045	.033	5.719	.211	3.977	.049
HF4/HF2	.309	.096	.074	6.386	.236	4.439	.015

Note: AARSRA = Adolescent Anger Rating Scale Reactive Anger, HF4 = Historical Factor of Intact Household, HF2 = Historical Factor of Past History of Aggression

Table 5 displays the unstandardized regression coefficients (B), the standardized regression coefficients (β), R^2, adjusted R^2, p value, and overall F for each step in the regression equations. Of the four scales of the ROAS obtained from staff ratings, only Total Aggression and Verbal Aggression entered into the regression equation. A statistically significant relationship between the dependent variables and predictor variables was found (ANOVA table significance for the Total Aggression scale (.036) and for steps 1 (.049) and 2 (.015) of the Verbal Aggression model). The AARS Reactive Anger subscale accounted for a significant amount of the variance in Staff Total Aggression yielding an overall $\underline{R}$ of .225, $\underline{F}$ (1, 86) = 4.548, $\underline{p} < .05$, with a medium effect size of .46 (Hoenig & Heisey, 2001; Cohen, 1968).

The historical variables a) not having an intact household (HF4) and b) having a history of physical aggression (HF2) accounted for a significant amount of the variance in Verbal Aggression (Staff ROAS VA). The presence of a single parent household alone (HF4) yielded an overall $\underline{R}$ of .211, $\underline{F}$ (1, 86) = 3.977, $\underline{p} < .05$, with a medium effect size of .43. The presence of HF4 with a past history of aggression (HF2) combined to yield an overall $\underline{R}$ of .309, $\underline{F}$ (1,86) = 4.439, $\underline{p} < .05$, with a medium effect size of .65 (Hoenig & Heisey, 2001; Cohen, 1968).

The R^2 value for the Total Aggression variable model is .051. The independent variable (AARSRA) in the regression accounts for 5.1% of the variance in the dependent variable. In the second equation, the first step of the regression indicates that HF4 explains 4.5% of the variance in the dependent variable of Verbal Aggression. The second step in this equation indicates the HF4 and HF2 collectively explain 9.6% of the variance in the dependent variable of Verbal Aggression. Since the adjusted R^2 in both significant equations was close to the R^2 values in each step, the program anticipates minimal shrinkage.

The B coefficient determined the direction of the relationship between IV and DV. For example, Staff Total Aggression should increase by .389 units for every unit change in the AARSRA variable. None of the excluded variables had a tolerance less than 0.10, so there is no indication that a variable was excluded from the regression equation because of a very strong relationship with one of the variables included in the analysis.

Although these relationships found may be statistically significant, they may not be clinically or practically significant. For example, the fact that the AARSRA scale

accounts for only 5.1% of the variance of Total Aggression indicates that this scale is only able to predict a minimal amount of aggressive behavior. It is possible that the skewed distribution of some of the dependent variables might have affected the regression analyses and veiled significant relationships. As mentioned before, of the 87 total adolescents in the sample, Staff ROAS ratings identified 38 (43.7%) as demonstrating no aggression whatsoever. This discrepancy is even more apparent when looking at each of the Staff ROAS aggression subscales in regard to the number of adolescents who were reported to have exhibited no aggression: Verbal Aggression 38 (43.7%), Physical Aggression Against Objects 62 (71.3%), and Physical Aggression Against Others 72 (82.8%). Therefore, Descriptive Discriminant analysis was chosen as the statistical method to determine whether or not the aggressive youth differed from the non-aggressive group on any of the independent variables in a meaningful way. The youth were placed into two groups by examining the variables of Total Aggression, Verbal Aggression, Physical Aggression Against Objects, and Physical Aggression Against Others. Each group was collapsed into two categories: non-aggressive youth (those who displayed no aggression during the study) and aggressive youth (those youth who had at least one incident of aggression during the study). In this way, the adolescents who showed no aggressive behavior were compared to the adolescents who did exhibit aggressive behaviors, in each of the different subcategories. The Historical variables, YSR subscales, and AARS subscales were used as the discriminating variables and the group membership (aggressive vs. non-aggressive) served as the dependent variable. The significant results from these analyses are illustrated in Table 6.

Table 6
Stepwise Discriminant Analysis Total Aggression & Verbal Aggression

	Wilks' Λ	F to-enter	F to-remove	P	Exact F
Total/Verbal Aggression Steps/Predictors					
YSR16	.869	2.71	12.78	.001	12.78

The impact of multicollinearity and the assumption of homogeneity of the covariance matrices were examined. Multicollinearity occurs if there is very small tolerance values for variables in the discriminant function analysis, e.g. less than 0.10. The smallest tolerance for any variable not included in the discriminant analysis equation was 0.466 (YSR8), supporting a conclusion that multicolinearity is not a problem in this analysis. The Box's M statistic determined whether or not the assumption of equal dispersion of the dispersion or covariance matrices (multivariate measure of the variance) was met. The Box's M statistic was insignificant (F=.013, p=.911), thus the dispersion matrices for the groups are equal.

Only one discriminant function was found between the two groups on the variables on Total Aggression (Staff ROAS Tot) and Verbal Aggression (Staff ROAS VA). This function was comprised of the Oppositional Defiant Disorder Scale (YSR16) on the Youth Self Report (mean T scores = 62.45 vs. 69.14). The Oppositional Defiant Disorder scale was the only variable to significantly classify the two groups: Wilks' Lambda = .869, Chi Square (1, 85) = 11.836, $\underline{p}$ = .001, with a large effect size of .79 (Hoenig & Heisey, 2001; Cohen 1968). The Chi Square score indicated statistically significant separation of the groups on this function.

Discriminant analyses were also run using the aggressive and nonaggressive groupings obtained from the staff ROAS measures of Physical Aggression Against Objects (Staff ROAS PO) or Physical Aggression Against Persons (Staff ROAS PP). However, no significant function was found, using any of the discriminating variables that accurately discriminated between aggressive and non-aggressive adolescents on these dependent variables.

Since there was only one function found in this analysis, the YSR16 variable accounts for 100% of the between-group variance (separation) on this function. The Canonical correlation of .362 describes the discriminating power of the identified function as the correlation between scores on the function and scores on the variable that defines group membership. The squared canonical correlation of .131 indicates the proportion of the total variance in the discriminant function that is explained by group membership. Therefore, group membership explains 13% of the variance in the discriminant function, measured by the ODD subscale of the YSR.

The inverse of the canonical correlation is the Wilks's Lambda statistic (.869). Wilks' Lambda is the proportion of the total variance in the discriminant scores not explained by differences among the groups and is used to test the null hypothesis that the means of all of the independent variables are equal across groups of the dependent variable. The chi-square statistic (11.836, $\underline{p} = .001$) corresponding to Wilks' Lambda is statistically significant indicating that there is a significant relationship between the dependent groups and the independent variable. Although statistically significant, in this sample about 87% of the variance is not explained by group differences.

Because of the high proportion of unexplained variance, it is necessary to determine what exactly is being measured by the discriminant function. In the following table, the variable correlations and difference in group centroids for the lone function were examined.

Table 7
Discriminant Function – Variable Correlations and Group Centroids for Aggressive vs. Non-Aggressive Youth

Variables	Discriminant Function
YSR16	1.000
YSR8(a)	.731
YSR10(a)	.686
YSR17(a)	.684
YSR7(a)	.505
YSR15(a)	.493
AARSRA(a)	.491
YSR11(a)	.485
HF2(a)	.429
AARSIA(a)	.409
HF1(a)	.349
AARSAC(a)	-.335
YSR6(a)	.309
YSR4(a)	.287
YSR5(a)	.263
HF3(a)	.238
YSR1(a)	.223
YSR12(a)	.220
YSR13(a)	.211
YSR9(a)	.197
HF5(a)	.188
YSR14(a)	.127
YSR3(a)	.120
YSR2(a)	.101
HF4(a)	-.050
HF6(a)	.030
Group Centroids	Discriminant Function
Non-Aggressive Youth	-.435
Aggressive Youth	.338
Fisher's linear discriminant functions	
Non-Aggressive Youth	.832
Aggressive Youth	.921

Note: YSR16 = Oppostional Defiant Disorder, YSR8 = Aggressive Behavior, YSR10 = Externalizing Problems, YSR17 = Conduct Problems, YSR7 = Rule Breaking Behavior, YSR15 = ADHD, AARSRA = Reactive Anger, YSR11 = Total Problem, HF2 = Physical Aggression, AARSIA = Instrumental Anger, HF1 = Destruction of Property, AARSAC = Anger Control, YSR6 = Attention Problems, YSR4 = Social Problems, YSR5 = Thought Problems, HF3= Verbal Aggression, YSR1 = Anxious/Depressed, YSR12 = Affect Problems, YSR13 = Anxious Problems, YSR9 = Internalizing Problems, HF5 = Abuse/Neglect, YSR14 = Somatic Problems, YSR3 = Somatic Complaints, YSR2 = Withdrawn/Depressed, HF4 = Intact Household, HF6 = Witnessed Abuse/Neglect.

Correlations between the discriminant function and the original variables provided a valuable indication of what was being measured by the discriminant function. Examination of the correlations of the variables Table 7 reveals several of the scales that were previously hypothesized by the primary investigator to merit inclusion in the study were highly correlated with the Discriminant Function. For example, the YSR8 scale (Aggressive Behavior) .731, YSR10 (Externalizing Problems) .686, YSR17 (Conduct Problems) .684, YSR7 (Rule Breaking Behavior) .505, YSR15 (AD/HD) .493, AARSRA (Reactive Anger) .491, YSR11 (Total Problem Behavior) .485, HF2 (History of Physical Aggression) .429, and AARSIA (Instrumental Anger) .409 were all scales which theoretically should measure similar aspects of the construct of aggression.

Taken as a whole, statistical significance of the discriminant function is necessary but not sufficient too ensure that classification will be made with acceptable levels of accuracy (practical utility). The classification accuracy of the discriminant function may be considered the ultimate measure of the practical value of the model. The classification analysis for the discriminant function follows in Table 8.

Table 8
Classification Analysis

		Predicted Group Membership		
		Non-Aggressive	Aggressive	Total
Original	Non-Aggressive	21 (55.3%)	17 (44.7%)	38
	Aggressive	12 (24.5%)	37 (75.5%)	49
Cross-validated	Non-Aggressive	21 (55.3%)	17 (44.7%)	38
	Aggressive	12 (24.5%)	37 (75.5%)	49

Note: In cross validation, each case is classified by the functions derived from all cases other than that case. 66.7% of original grouped cases were correctly classified. 66.7% of cross-validated grouped cases were correctly classified.

Classification accuracy is the ultimate measure of the value of the model. Using a leave-one-out classification option, computing from group sizes, the accuracy/model fit was improved. The YSR16 subscale accurately classified 55.3% (n=21/38) of the non-aggressive youth and (n=37/49) 75.5% of the aggressive youth into the designated groups (an overall classification rate of 66.7%). The holdout accuracy rate is compared to each of the by chance accuracy rates. The proportional chance criteria for assessing model fit was calculated to be 51%. Based on the requirement that model accuracy be 25% better than the chance criteria, the standard to use for comparing the models accuracy is 64%. The current model accuracy rate of 66.7% exceeds this standard.

CHAPTER V

DISCUSSION

In referred youth, suspected to have psychiatric problems, aggressive behavior has shown a noticeable increase in the past two decades. Base rates of 15-30% of psychiatric patients committing physical assault while in the hospital are commonly reported (Bjorkly, 1995). Garrison (1984) found 1038 incidents of observed, interpersonal aggression in an inpatient unit over a two-year period. Cunningham, Connor, Miller, and Melloni (2003) found that 83.3% of hospital direct care staff reported having been threatened verbally and 64.7% reported having been physically assaulted.

The management of inpatient aggression has become a primary therapeutic concern for two reasons: the impact of violence on patient progress (both the individual and the other patients on the unit) and the consequences of staff victimization (Day, Franklin, & Marshall, 1998; Merckelbach, Evers, Palmstierna, & Campo 2002).

Accurate diagnostic decision-making is important to ensure that the most appropriate interventions are provided as well as a safer and more effective milieu (Vivona, Ecker, Halgin, Cates, Garrison, & Friedman, 1995). Modern practice is now leaning toward accuracy, briefness, and cost-effectiveness (Danielson, Youngstrom, Findling, & Calabrese, 2003).

"Few characteristics have been found to discriminate reliably youngsters who engage in disparate types of aggressive behavior during hospitalization." (Vivona, Ecker,

Halgin, Cates, Garrison, & Friedman, 1994, p.435). Several important factors have been identified in the literature as having important predictive value of aggressive behavior in youth: past history (Borum, 2000; Day, Franklin, & Marshall, 1998; Farrington, 1995; Mossman, 1994), inattention/hyperactivity (Barkley, Fisher, Edelbrock, & Smallish, 1990; Borum, 2000; Brannigan et al, 2002; Connor, Edwards, Fletcher, Baird, Barkley, Steingard, 2003; Farrington,1989; Loeber, Green, Keenan, & Lahey, 1995), and anger (Cornell, Peterson, & Richards, 1999; Furlong & Smith, 1998; 1994; Novaco, 1994).

The goal of this study was to determine which ways aggressive inpatient youth differ from non-aggressive inpatient youth based on self-report measures. The Child Behavior Check List Youth Self Report (YSR) and the Adolescent Anger Rating Scale (AARS), combined with self-report of historical factors identified from the literature as possible contributors to the development of aggressive behavior, were thought to reflect previously identified risk factors in the literature. It was hypothesized that these variables or combinations of these variables could be used as accurate, reliable predictors to help hospitals predict which adolescents might display higher levels of aggressive behaviors while in treatment as well as differentiate aggressive inpatient youth from their non-aggressive counterparts.

Step-wise multiple regression analysis was used to determine whether or not the independent variables or combination of the independent variables could accurately predict increased levels of aggressive behaviors in inpatient adolescents. In terms of Total Aggressive Behavior (all forms of aggressive behavior combined), as measured by Staff report, only one of the identified subscales was found to significantly account for the variance. The Adolescent Anger Rating Scale Reactive Anger subscale (AARSRA)

accounted for 5.1% of the variance in the dependent variable of Total Aggression. The AARSRA was "designed to measure responses that are immediately externalized (i.e., hitting, yelling) by the individual" (p.447). These findings are theoretically meaningful due to the selective nature of adolescent inpatient units. Inpatient psychiatric care is considered to be the highest level of mental health care in the United States from the financial, restrictiveness, and treatment intensity standpoints. Youth admitted to inpatient units are typically required by funding sources, such as health maintenance organizations (HMOs) or Medicaid, or state government to be a danger to self or others, or at minimum, have a justifiable Axis I disorder. Often youth in inpatient settings have proved resistant to less restrictive environments or less intensive treatments. Therefore, the youth admitted into inpatient programs often have varied and complex mental health and behavioral difficulties.

Examining the dependent variable of Verbal Aggression, a combination of independent variables was found to be significantly predictive. The historical factors of not having an intact household and having a history of physical aggression accounted for a significant amount of the variance in verbal aggression. The presence of a single parent household alone explains 4.5% of the variance verbal aggression displayed by youth. The second step in the regression equation indicated that the two factors collectively explain 9.6% of the variance in verbal aggression. As discussed in the literature, youth who are cared for in a household with a single parent are more at risk for developing aggressive patterns of behavior. Reid, Patterson, & Snyder (2002) found that improved monitoring is the most effective way to reduce acting out behaviors in children and adolescents. When a child does not grow up in an intact household and reports a history

of physical aggression, the highly structured and monitored milieu of the inpatient unit might provide the environmental constraints that would lead to reduced physical aggressiveness. Youth in a single parent home may be provided less structure and monitoring in both their neighborhood and school setting, so their opportunity to engage in physically aggressive behaviors increases (Brannigan, Gemmell, Pevalin, and Wade 2002). However, in the inpatient setting, the staff to youth ratio is typically at 4:1 and youth are constantly monitored. A youth that may have acted out by becoming physically aggressive before their admission is no longer afforded the luxury of poor adult monitoring. When a youth initiates a verbally or physically aggressive behavioral sequence, the initial behavior is addressed immediately and consequences are given. The low tolerances of an inpatient milieu likely provide youth less of an opportunity to become physically aggressive. In addition, hospital staff are trained in verbal de-escalation skills and physical aggression management, and have the option of using very intensive and restrictive interventions such as physical holds, seclusion, or even mechanical restraint. With lowered tolerances, preventative interventions, and aversive consequences available, youth are likely to display a less aggressive pattern of behavior than in their previous environment.

Although the relationships found in the regression analyses were statistically significant, they were determined to be of minimal clinical or practical significance. For example, reactive anger accounts for only a minimal amount of total aggressive behavior (5.1% of the variance). It was surmised that the skewed distribution of some of the dependent variables affected the regression analyses and veiled significant relationships. As mentioned before, of the 87 total adolescents in the sample, staff ratings of aggression

identified 38 (43.7%) as demonstrating no aggression whatsoever. This discrepancy is even more apparent when looking at each of the staff aggression subscales in regard to the number of adolescents who were reported to have exhibited no aggression: Verbal Aggression 38 (43.7%), Physical Aggression Against Objects 62 (71.3%), and Physical Aggression Against Others 72 (82.8%).

This study attempted to determine if self-report measures could accurately predict aggressive behaviors of inpatient youth. The multiple regression analysis above only tells part of the story, that overall aggressive tendencies are predicted by decreased monitoring and history of reactive aggression. However, many of the youth admitted to the inpatient units in this study did not act as aggressively as their history and self-report measures suggest they did before their admission. Of the youth in the study (n=87), 44% displayed no aggressive behavior during the assessment period. Given this finding, a more important question may be: Why do some youth respond to the structure of inpatient treatment milieus while others do not?

To answer this question, the total sample (n=87) was split into two identified groups, adolescents who exhibited no aggression during the study period (n=38) and adolescents who exhibited aggressive behavior (n=49). Descriptive Discriminant analysis was chosen as the statistical method to determine whether or not the aggressive youth differed from the non-aggressive group on any of the independent variables in a meaningful way.

Only one significant discriminant function was found between the two groups on the variables of total aggression and verbal aggression. This function was comprised of the Oppositional Defiant Disorder Scale on the Youth Self Report (mean T scores =

62.45 vs. 69.14). Group membership explained 13% of the variance in the discriminant function, measured by the ODD subscale of the YSR. Using a leave-one-out classification option, computing from group sizes, the accuracy/model fit determined that 55.3% (n=21/38) of the non-aggressive youth and (n=37/49) 75.5% of the aggressive youth were placed into the correct groups (an overall classification rate of 66.7%).

The reason that the oppositional defiant disorder scale is best at differentiating aggressive versus non-aggressive youth is that youth with this pattern of behavior may respond less favorably to the monitoring and structure of the inpatient unit. Youth that are less defiant and hostile toward authority figures may respond when the environmental controls are tighter, i.e. they are monitored and given consistent consequences. In fact, the diagnostic criteria for ODD, which the YSR subscale is based upon, illustrates important information about these youth. According to the DSM-IV-TR (2000), Oppositional Defiant Disorder is characterized by a pattern of negativistic, hostile, and defiant behavior lasting at least 6 months, during which four (or more) of the following are present: (1) often loses temper (2) often argues with adults (3) often actively defies or refuses to comply with adults' requests or rules (4) often deliberately annoys people (5) often blames others for his or her mistakes or misbehavior (6) is often touchy or easily annoyed by others (7) is often angry and resentful (8) is often spiteful or vindictive.

Youth with an oppositional and defiant pattern of behavior are more likely to rebel against rules and attempts to intervene by adults, resulting in a greater resistance to treatment and intervention. This would be in contrast to a youth who is suffering from features of a mood disorder or unsupportive environment. Once these adolescents'

symptoms are addressed or they are put in a more positive, supportive, and structured environment, they may have less of a tendency to act out in aggressive ways.

From a clinically descriptive standpoint, T scores on the YSR ODD subscale from 65 to 69 are considered to be within the Borderline Clinically Significant Range while T Scores 70 or above are considered to be in the Clinically Significant Range. Of the 37 adolescents who endorsed enough items on the YSR ODD subscale to obtain T scores in the clinically significant range, 26 (70%) of those youth displayed aggressiveness according to Staff report. Of the 50 youth that obtained scores within either the Borderline Clinically Significant Range or the normal range, only 23 (46%) displayed aggressive behavior. Of the 54 adolescents who obtained T scores in either the Borderline or Clinically Significant Ranges, 37 (69%) displayed aggressiveness. Of the 33 youth that obtained score within the normal range, only 12 (36%) displayed aggressiveness. The mean T score for the aggressive adolescents was 69.14 while the non-aggressive adolescents obtained a mean T score of 62.45.

Summary of Results

The results of this study suggest that Self-Report measures such as the Child Behavior Check List Youth Self Report, Adolescent Anger Rating Scale, and Historical Information offer clinicians a statistically significant means of predicting overall aggressiveness of adolescents within inpatient facilities, in regard to overall aggressive behavior, specifically verbally aggressive behavior.

In terms of predicting overall aggressiveness of adolescent inpatient youth, the construct of reactive anger was found to be most useful. In terms of verbal aggressiveness of inpatient youth, the historical variables of not living in an intact

household (with two parents) and having a history of physical aggression were most predictive.

The Oppositional Defiant Disorder Subscale of the Youth Self Report was found to be a statistically significant means of differentiating between aggressive and non-aggressive youth in terms of both total aggressive behavior and verbal aggression.

Limitations of Study

The first limitation of this study is likely the small number of subjects, which may have deceased statistical power. Although some significant findings were present, some of the non-significant results may have been negatively impacted by this limitation. Related to this limitation is the fact that the study was conducted in only one inpatient psychiatric facility for adolescents. There may have been inherent selection bias due to the specific screening procedures (e.g. selection criteria or insurance/payment factors) of this particular facility, leading some youth who may have contributed useful data to the study being excluded.

Another limitation is the short length of the data collection period for each adolescent. Due to current hospital policy, driven by insurance and payment considerations, many adolescents will not remain in inpatient psychiatric facilities for more than a two week period, if that. The absence of long-term behavioral data may have limited the study due to the fact that many adolescents will "honeymoon", or fake good, for a period of time before they allow their previous patterns of behavior to emerge in the new setting.

The lack of parent or caregiver report is an additional limitation. Future studies should attempt to gain the additional valuable information that could be gained from

parent/guardian report. Unfortunately, many of the participants in this study were initially brought to the hospital by caseworkers or law enforcement personnel, who were not the primary caregivers for the youth prior to admission and were unable to give accurate, reliable background information regarding the child's frequency and intensity of aggressive behavior. In addition, the self-report measures utilized did not elicit degree of the historical factors (e.g., the extent and duration of abuse/neglect, number of fights, contextual variables surrounding past aggressive acts).

The final limitation was that staff report of aggressive behavior was used instead of objective behavioral observations. Although the Retrospective Overt Aggression Scale reports adequate validity and reliability, it is likely that meaningful data was lost on participants during the data collection period. While the method of data collection used was obviously chosen due to financial and temporal concerns, future studies could benefit from the additional data gained from direct observational data.

Future Research

Future research in this area should focus on remedying the limitations of this study: increasing sample size, adding more inpatient sites (or even various other levels of care), adding caregiver report, utilizing direct observational data, performing functional analyses, or performing longitudinal studies.

Practical Significance of the Study

This study has contributed to psychology's body of knowledge by giving support to a quick, cost effective way for inpatient facilities to screen admitted youth for potential aggressiveness. The Child Behavior Check List Youth Self Report subscale of Oppositional Defiant Disorder was found to accurately discriminate between aggressive

and non-aggressive youth, particularly in terms of verbal aggression. Since the YSR is considered one of the "Gold Standard" instruments of behavioral rating scales, it would give useful information for inpatient facilities. Not only could it assist in alerting staff to potential problems with aggressive behavior, but it could also give treatment staff indications of the child's perceptions of their functioning in terms of multiple psychopathologies. Since the YSR is easy and cost/time effective to administer and score, clinicians would be justified in utilizing it as part of the assessment and intake process.

REFERENCES

Achenbach, T. (1991). *Manual for the Youth Self-Report and 1991 Profile.* Burlington, VT: University of Vermont, Department of Psychiatry.

Achenbach, T. & Edelbrock, C. (1983). *Manual for the Child Behavior Checklist and Revised Child Behavior Profile.* Burlington, VT: University of Vermont, Department of Psychiatry.

Andershed, H., Gustafson, S., Kerr, M., & Stattin, H. (2002). The usefulness of self-reported psychopathy-like traits in the study of antisocial behavior among non-referred adolescents. *European Journal of Personality, 16, 383-402.*

Bandura, A. 1965, Influence of models' reinforcement contingencies on the acquisition of imitative responses. Journal of Personality and Social Psychology, 1, 589-595.

Barkley, R., Fischer, M., Edelbrock, C., & Smallish, L. (1990). The adolescent outcome of hyperactive children diagnosed by research criteria: I. An 8 year prospective follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry,* 29, 546-557.

Belter, R. & Foster, K. (1996). Convergent validity of select scales of the MMPI and the Achenbach Child Behavior Checklist – Youth Self Report. *Psychological Reports, 79, 3, 1091-1097.*

Berkowitz, L. (1993). *Aggression – Its Causes, Consequences, and Control.* New York: McGraw-Hill, Inc.

Bjorkly, S. (1995). Prediction of Aggression in Psychiatric Patients: A review of prospective prediction studies. *Clinical Psychology Review, 15, 6, 475-502.*

Blackburn, R. (1983). Psychometrics and personality theory in relation to dangerousness. In J.W. Hinton (Ed.), *Dangerousness: Problems of assessment and prediction.* London: Allen & Unwin.

Blumensohn, R., Ratzoni, G., Weizman, A., Israeli, M., Greuner, N., Apter, A., Tyano, S., & Biegon, A. (1995). Reduction in serotonin 5HT receptor binding on platelets of delinquent adolescents. Psychopharmocology. 118:354-356.

Book, A., Starzyk, K., & Quinsey, V. (2001). The relationship between testosterone and aggression: a meta-analysis. Aggression and Violent Behavior. 6, 579-599.

Borum, R. (2000). Assessing Violence Risk among Youth. *Journal of Clinical Psychology*, vol. 56(10), 1263-1288.

Borum, R., Swartz, M., & Swanson, J. (1996). Assessing and managing violence risk in clinical practice. *Journal of Practical Psychiatry and Behavioral Health,*2, 4, 205-215.

Bowers, L. (1999). A critical appraisal of violent incident measures. *Journal of Mental Health, 8, 4, 339-349.*

Bradley, N., Kumar, S., Ranclaud, M., & Robinson, E. (2001). Ward Crowding and Incidents of Violence on an Acute Psychiatric Inpatient Unit. Psychiatric Services. 52: 521-525.

Brannigan, A., Gemmell, W., Pevalin, D., & Wade, T. (2002). Self-control and social control in childhood misconduct and aggression: The role of family structure, hyperactivity, and hostile parenting. *Canadian Journal of Criminology, 44, 2, 119-142.*

Burney, D. & Kromrey, J. (2001). Initial Development and Score Validation of the Adolescent Anger Rating Scale. *Educational and Psychological Measurement, 61, 3, 446-460.*

Cohen, J. (1968). Multiple regression as a general data-analytic system. *Psychological Bulletin,* 70, 426-443.

Connor, D. (1998). Overt Categorical Aggression in Referred Children and Adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry. Located at: www.findarticles.com*

Connor, D.F. (2002). *Aggression and Antisocial Behavior and Children and Adolescents: Research and Treatment.* New York: The Guilford Press.

Connor, D., Edwards, G., Fletcher, K., Baird, J., Barkley, R., Steingard, R. (2003). Correlates of comorbid psychopathology in children with ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry.* 42, 2, 193-200.

Cornell, D., Peterson, C., & Richards, H. (1999). Anger as a Predictor of Aggression Among Incarcerated Adolescents. *Journal of Consulting and Clinical Psychology, 67, 1, 108-115.*

Crane-Ross, D., Tisak, M., & Tisak, J. (1998). Aggression and Conventional Rule Violation Among Adolescents: Social-Reasoning Predictors of Social Behavior. *Aggressive Behavior, 24, 347-365.*

Cunningham, J., Connor, D., Miller, K., & Melloni, R. H. Jr. (2003). Staff Survey Results and Characteristics That Predict Assault and Injury to Personnel Working in Mental Health Facilities. Aggressive Behavior. 29,31-40.

Daffern, M. & Howells, K. (2002). Psychiatric inpatient aggression: A review of structural and functional assessment approaches. Aggression and Violent Behavior. 7, 477-497.

Danielson, C., Youngstrom, E., Findling, R., & Calabrese, J. (2003). Discriminative Validity of the General Behavior Inventory Using Youth Report. *Journal of Abnormal Child Pyschology, 31, 1, 29-39.*

Day, H.D., Franklin, J.M., & Marshall, D.D. (1998). Predictors of aggression in Hospitalized Adolescents. *The Journal of Psychology, 132, 4, 427-434.*

DeFrancesco, J., Armstrong, S., & Russolillo, P. (1996). On the reliability of the Youth Self-Report. *Psychological Reports, 79, 322.*

DeVoe, J.F., Peter, K., Kaufman, P., Ruddy, S.A., Miller, A.K., Planty, M., Snyder, T.D., Duhart, D.T., and Rand, M.R. Indicators of School Crime and Safety: 2002. U.S. Departments of Education and Justice. NCES 2003-009/NCJ 196753. Washington, DC: 2002

Derzon, J. (2001). Antisocial behavior and the prediction of violence: A meta-analysis. *Psychology in the Schools, 38, 2, 93-106.*

Dolan, M. & Doyle, M. (2000). Violence risk prediction: Clinical and actuarial measures and the role of the Psychopathy Checklist. *British Journal of Psychiatry, 177, 303-311.*

Dosher, B. A. 1981, The effects of delay and interference: A speed-accuracy study, Cognitive Psychology 13, 541-574.

Farrington, D. (1989). Early predictors of adolescent aggression and adult violence. *Violence and Victims, 4, 79-100.*

Farrington, D., Lambert, S., & West, D. (1998). Criminal careers in two generations of family members in the Cambridge Study of Delinquent Development. Studies on Crime and Crime Prevention, 7, 1-22.

Farrington, D. (1995). Key issues in the integration of motivational and opportunity-reducing crime prevention strategies. In P. Wikstrom, R. Clarke, & J. McCord (Eds.), Integrating crime prevention strategies: Propensity and opportunity (pp.333-357). Stockholm, Sweden: National Council for Crime Prevention.

Faurie, W. (1990). Prediction of length of hospitalization of adolescent inpatients utilizing the Pd scale of the MMPI and demographic data. *Adolescence, 25, 98, 305-310.*

Ferris, C.F. & Grisso, T. (1996). *Understanding Aggressive Behavior in Children.* (Volume 794). New York: New York Academy of Sciences.

Finzi, R., Ram, A., Har-Even, D., Shnit, D., & Weizman, A. (2001). Attachment styles and aggression in physically abused and neglected children. *Journal of Youth and Adolescence, 30, 6, 769-786.*

Fottrell, E. (1980). A study of violent behavior among patients in psychiatric hospitals. British Journal of Psychiatry, 136, 216-221.

Furlong, M. & Smith, D. (Eds.). (1994). *Anger, Hostility, and Aggression: Assessment, Prevention, and Intervention Strategies for Youth*. Brandon, VT: Clinical Psychology Publishing Company, Inc.

Furlong, M. & Smith, D. (1998). Raging Rick to Tranquil Tom: An empirically based multidimensional anger typology for adolescent males. *Psychology in the Schools, 35, 3, 229-245.*

Garrison, W. (1984). Predicting Violent Behavior in Psychiatrically Hospitalized Boys. *Journal of Youth and Adolescence, 13, 3, 225-238.*

Golden, C., Jackson, M., Peterson-Rohne, A., & Gontkovsky, S. (1996). Neuropsychological correlates of violence and aggression: A review of the clinical literature. Aggression and Violenct Behavior, 1, 1, 3-25.

Goodenough, F. (1931). Anger in young children. Minneapolis: University of Minnesota Press.

Halliday-Boykins, C. & Graham, S. (2001). At both ends of the gun: Testing the relationship between community violence exposure and youth violent behavior. *Journal of Abnormal Child Psychology, 29, 5, 383-402.*

Hart, S.D. (1988). Psychopathy and risk for violence. In Psychopathy: Theory, Research, and Implications for Society, D. Cooke, A.E. Forth, & R.D. Hare (Eds.), pp.355-375. Dordrecht, The Netherlands: Kluwer.

Hart, S.D. (1988). The role of psychopathy in assessing risk for violence: Conceptual and methodological issues. *Legal and Criminalogical Psychology, 3, 121-137.*

Hawkins, J., Herrenkoh, T., Farrington, D., Brewer, D., Catalano, R., & Harachi, T. (1998). A review of predictors of youth violence. In R. Loeber & D. Farrington (Eds.), Serious and violent juvenile offenders: Risk factors and successful interventions (pp.106-146). Thousand Oaks, CA: Sage.

Herrenkohl, R. & Russo, M. (2001). Abusive early child rearing and early childhood aggression. *Child Maltreatment, 6, 1, 3-16.*

Heusmann, L. R. (Ed.). (1994). *Aggressive Behavior – Current Perspectives.* New York: Plenum Press.

Hintzman, D. L., and Caulton, D. A. 1997, Recognition memory and modality judgments: A comparison of retrieval dynamics, Journal of Memory and Language 37, 1-23.

Hoenig, John M. and Heisey, Dennis M. (2001), `The Abuse of Power: The Pervasive Fallacy of Power Calculations for Data Analysis, *The American Statistician,* 55, 19-24.

Holmberg, M. (1977). The development of social interchange patters from 12 to 42 months: Cross-sectional and short-term longitudinal analyses. Unpublished doctoral dissertation, University of North Carolina at Chapel Hill.

Hutchings, B. & Mednick, S.A. (1974). Registered criminology in the adoptive and biological parents of registered male criminal adoptees. In S.A. Mednick, F. Schulsinger, J. Higgins, & B. Bell (Eds.), Nebraska symposium on motivation (vol. XX, PP. 155-181). Lincoln: University of Nebraska Press.

Ivarsson, T., Gillberg, C., Arvidsson, T., & Broberg, A. (2002). The Youth Self-Report (YSR) and the Depression Self-Rating Scale (DSRS) as measures of depression and suicidality among adolescents. *European Child & Adolescent Psychiatry, 11, 31-37.*

Kafantaris, V., Lee, D., Magee, H., Winny, G., Samuel, R., Pollack, S., & Campbell, M. (1996). Assessment of Children with the Overt Aggression Scale. *The Journal of Neuropsychiatry and Clinical Neurosciences, 8, 186-193.*

Kay, S.R., Wolkenfeld, F., & Murrill, L.M. (1988). Profiles of aggression among psychiatric patients. *Journal of Nervous and Mental Disease, 176, 539-546.*

Kay, S.R., Wolkenfeld, F., & Murrill, L.M. (1988). Profiles of aggression among psychiatric patients pt 2: Co-variates and predictors. *Journal of Nervous and Mental Disease, 176, 547-557.*

Keltikangas-Jarvinen, L. (2002). Aggressive problem-solving strategies, aggressive behavior, and social acceptance in early and late adolescence. *Journal of Youth and Adolescence, 31, 4, 279-287.*

Kindlon, D., Tremblay, R., Mezzacappa, E., Earls, F., Laurent, D., & Schaal, B. (1995). Longitudinal patterns of heart rate and fighting behavior in 9- through 12-year-old boys. *Journal of the American Academy of Child and Adolescent Psychiatry*. 34, 3, 371-377.

Kruesi, M., Rapoport, J., Hamburger, S. (1990). Cerebrospinal fluid monoamine metabolites, aggression, and impulsivity in disruptive behavior disorders of children and adolescents. *Archives of General Psychiatry*. 47:419-426.

Lahey, B., Hart, E., Pliszka, S., Applegate, B. (1993). Neurophysiological correlates of conduct disorder: A rationale and review of research. *Journal of Clinical Child Psychology Special Issue: The neuropsychological basis of disorders affecting children and adolescents.* 22:2, 141-153.

Lam, J., McNiel, D., & Binder, R. (2000). The Relationship Between Patients' Gender and Violence Leading to Staff Injuries. Psychiatric Services. 51:9, 1167-1170.

Lanza, M. & Milner, J. (1989). The dollar cost of patient assault. *Hospital and Community Psychiatry, 40, 1227-1229.*

LeMarquand, D., Pihl, R., Young, S., Tremblay, R., Seguin, J., Palmour, R., & Benkelfat, C. (1998). Tryptophan Depletion, Executive Functions, and Disinhibition in Aggressive, Adolescent Males. Neuropsychopharmocology. 19:4, 333-341.

Lewis, J. R. 1994, Sample sizes for usability studies: Additional considerations, Human Factors, 36, 368-378.

Lockwood, D. (1997). Violence Among Middle School and High School Students: Analysis and Implications for Prevention. National Institute of Justice: Research in Brief. October.

Loeber, R., Green, S., Keenen, K., & Lahey, B. (1995). Which boys will fare worse? Early predictors of the onset of conduct disorder in a six-year longitudinal study. *Journal of the American Academy of Child and Adolescent Psychiatry, 34, 499-509.*

Loper, A., Hoffschmidt, J., & Ash, E. (2001). Personality Features and Characteristics of Violent Events Committed by Juvenile Offenders. *Behavioral Sciences and the Law, 19, 81-96.*

Lowe, L. (1998). Using the Child Behavior Checklist in Assessing Conduct Disorder: Issues of Reliability and Validity. *Research on Social Work Practice, 8, 3, 286-301.*

McMurran, M., Blair, M., & Egan, V. (2002). An investigation of the correlations between aggression, impulsiveness, social problem-solving, and alcohol use. *Aggressive Behavior, 28, 439-445.*

Maguin, E., & Loeber, R. (1996). Academic performance and delinquency. In M. Tonry (Ed.), Crime and Justice: A review of research (Vol. 220, pp. 145-264). Chicago: University of Chicago Press.

Malek, M., Bei-Hung, C., & Davis, T. (1998). Fighting and Weapon-Carrying Among Seventh-Grade Students in Massachusetts and Louisiana. Journal of Adolescent Health. 2, 94-102

Matykiewicz, L., Grange, L., Vance, P., Wang, M., & Reyes, E. (1997). Adjudicated Adolescent Males: Measures of Urinary 5-Hydroxyindoleacetic Acid and Reactive Hypoglycemia. Personal and Individual Differences. 22:3, 3270332.

Mednick, S.A. (1981). The learning of morality: Biosocial Bases. In D.O. Lewis (Ed.), Vulnerabilities to delinquency. (pp. 187-204). New York: SP Medical and Scientific Books.

Merriam-Webster Online Dictionary (2003) http://www.m-w.com/cgi-bin/dictionary Accessed on March 20, 2003.

Minarik, M., Myatt, R., Mitrushina, M. (1997). Adolescent Multiphasic Personality Inventory and Its Utility in Assessing Suicidal and Violent Adolescents. *Suicide and Life-Threatening Behavior, 27, 3, 278-284.*

Moffitt, T. (1996). Measuring children's antisocial behaviors. *JAMA, 275, 5, 403-406.*

Moffitt, T., Caspi, A., Silva, P., & Stouthamer-Loeber, M. (1995). Individual differences in personality and intelligence are linked to crime: cross-context evidence from nations, neighborhoods, genders, races, and age-cohorts. In Hagen, J. (Ed.). *Delinquency and Disrepute in the Life Course: Contextual and Dynamic Analysis.* Greenwich, Conn: JAI Press. 1-34.

Moffitt, T.E. & Lynam, D., Jr. (1994). The neuropsychology of conduct disorder and delinquency: Implications for understanding antisocial behavior. In D.C. Fowles, P. Sutker, & S.H. Goodman (Eds.), Progress in experimental personality and psychopathology research (pp.233-262). New York: Springer.

Morgan, C. & Cauce, A. (1999). Predicting DSM-III-R disorders from the Youth Self-Report: Analysis of data from a field study. *Journal of the American Academy of Child and Adolescent Psychiatry, 38, 10, 1237-1245.*

Mossman, D. (1994). Assessing predictions of violence: Being accurate about accuracy. *Journal of Counsulting and Clinical Psychology.* 62, 783-792.

Nagin, D. & Tremblay, R. (2001). Parental and early childhood predictors of persistent physical aggression in boys from kindergarten to high school. *Archives of General Psychiatry, 58, 4, 389-394.*

Nijman, H., Campo, J., Ravelli, D., & Merckelbach, H. (1999). A Tentative Model of Aggression on Inpatient Psychiatric Wards. Psychiatric Services. 50. 6. 832-834.

Nijman, H., Merckelbach, H., Evers, C., Palmstierna, T., & Campo, J. (2002). Prediction of aggression on a locked psychiatric admissions ward. *Acta Psychiatr Scand, 105, 390-395.*

Novaco, R. (1994). Anger as a risk factor for violence among the mentally disordered. In Monahan, J., & Steadman, H. (Eds.), Violence and mental disorder: Developments in risk assessment (pp.21-60). Chicago: The University of Chicago Press.

O'Keefe, M. (1997). Adolescents' exposure to community and school violence: Prevalence and behavioral correlates. *Journal of Adolescent Health, 20, 368-376.*

Orpinas, P. & Frankowski, R. (2001). The aggression scale: A self-report measure of aggressive behavior for young adolescents. *Journal of Early Adolescence, 21, 1, 50-67.*

Osterman, K., Bjorkqvist, K., Lagerspetz, K., Charpentier, S., Caprara, G., & Pastoreili, C. (1999). Locus of control and three types of aggression. *Aggressive Behavior, 25, 61-65.*

Otto, R.K. (1992). Prediction of dangerous behavior: A review and analysis of "second generation" research. *Forensic Reports*, 5, 103-133.

Owen, C., Tarantello, C., Jones, M., & Tennant, C. (1998). Violence and Aggression in Psychiatric Units. Psychiatric Services, 49, 11, 1452-1457.

Parke, R. & Slaby, R. (1983). The development of aggression. In P.H. Mussen (Series Ed.) & E.M. Hetherington (Vol. Ed.), Handbook of child psychology (4th ed.): Vol. 4. Socialization, personality, and social development (pp. 547-641). New York: Wiley.

Paxton, R. & Anslow, P. (1997). Evaluation of a new record system for aggressive incidents in mental health services. *Journal of Mental Health, 6, 2, 150-169.*

Reed, A. V. (1973) Speed-accuracy tradeoff in recognition memory, *Science, 181*, 574-576.

Reid, J., Patterson, G., Snyder, J. (2002). *Antisocial behavior in children and adolescents: A developmental Analysis and Model of Intervention.* American Psychological Association.

Renfrew, J.W. (1997). *Aggression and Its Causes: A Biopsychosocial Approach.* New York: Oxford University Press.

Rivera, B., & Widom, C. (1990). Childhood victimization and violent offending. *Violence and Victims,* 5, 19-25.

Rosenblatt, A. & Rosenblatt, J. (2002). Assessing the effectiveness of care for youth with severe emotional disturbances: Is there agreement between popular outcome measures? *Journal of Behavioral Health Services & Research, 29, 3, 259-273.*

Ross, D.J., Hart, S.D., & Webster, C.D. (1998). Aggression in Psychiatric Patients: Using the HCR-20 to Assess Risk for Violence in Hospital and in the Community. Riverview Hospital, Medicine and Research.

Rule, B. (1974). The hostile and instrumental functions of human aggression. In J. de Wit & W. W. Hartup (Eds.), Determinants and origins of aggressive behavior (pp.125-145). The Hague: Mouton.

Rutter, M., Giller, H., & Hagell, A. (1998). *Antisocial Behavior by Young People.* New York: Cambridge University Press.

Satterfield, J.H. (1987). Childhood diagnostic and neurophysiological predictors of teenage arrest rates: An eight-year prospective study. In The Causes of Crime: New Biological Approaches. S.A. Mednick, T.E., Moffitt, & S. Stack, Eds. Cambridge University Press: Cambridge.

Saverimuttu A., Lowe, T. (2000). Aggressive Incidents on a psychiatric intensive care unit. Nursing Standard. 14, 35, 33-36. March 10, 2000.

Seguin, J., Pihl, R., Boulerice, B., Tremblay, R., & Harden, P. (1996). Low pain sensitivity and stability of physical aggression in boys. Annals of the New York Academy of Sciences, 794, 408-410.

Silver, J. & Yudofsky, S. (1987). Aggressive behavior in patients with neuropsychiatric disorders. Psychiatric Annals, 17, 367-370.

Small, M. & Tetrick, K.D. (2001). School Violence: An Overview. Juvenile Justice. Washington, D.C. Volume VIII, Number 1. Pages 3-12.

Smith, C., & Thornberry, T. (1995). The relationship between childhood maltreatment and adolescent involvement in delinquency. *Criminology,* 33, 451-481.

Snyder, H. & Sickmund, M. Juvenile Offenders and Victims: 1999 National Report, p. 62. Washington, D.C.: Office of Juvenile Justice and Delinquency Prevention, 1999.

Sorgi, P., Ratey, J., Knoedler, D.U., Markert, R.J. & Reichman, M. (1991). Rating aggression in the clinical setting: a retrospective adaptation of the overt aggression scale: preliminary results. *Journal of Neuropsychiatry, 3, s52-s56.*

Stoff, D.M., Breiling, J., & Maser, J.D. (1997). *Handbook of Antisocial Behavior.* New York: Wiley

Thurber, S. & Hollingsworth, D. (1992). Validity of the Achenbach and Edelbrock Youth Self-Report With Hospitalized Adolescents. *Journal of Clinical Child Psychology, 21, 3, 249-254.*

Tremblay, R. (2000). The development of aggressive behavior during childhood: What have we learned in the past century? *International Journal of Behavioral Development. 24, (2), 129-141.*

Tremblay, R.E., Boulerice, B., Harden, P.W., McDuff, P., Perusse, D., Pihl, R.O., & Zoccolilio, M. (1996). Do children in Canada Become more aggressive as they approach adolescence? In Human Resources Development Canada and Statistics

Canada (Eds.), *Growing up in Canada: National longitudinal survey of children and youth* (pp. 127-137). Ottawa: Statistics Canada.

Unis, A., Cook, E., Vincent, J., Gjerde, D., Perry, B., Mason, C., & Mitchell, J. (1997). Platelet Serotonin Measures in Adolescents with Conduct Disorder. Biological Psychiatry. 42:42:553-559.

U.S. Department of Education, National Center for Education Statistics, The condictions of Education, Washington, DC: U.S. Department of Education, 1995, p.362.

Van Praag, H.M., Plutchik, R. & Apter, A. (1990). *Violence and suicidality.* New York: Brunner/Mazel.

Vesavage, J.A. (1983). Inpatient violence and the psychiatric patient. Acta Psychiatrica Scandinavica, 67, 353-357.

Virzi, R. A. 1992, Refining the test phase of usability evaluation: How many subjects is enough?, Human Factors, 34, 457-468.

Vivona, J., Ecker, B., Halgin, R., Cates, D., Garrison, W., & Friedman, M. (1995). Self- and Other-Directed Aggression in Child and Adolescent Psychiatric Inpatients. *Journal of the American Academy of Child and Adolescent Psychiatry, 34, 4, 434-443.*

Walker, Z. & Seifert, R. (1994). Violent incidents in a psychiatric intensive care unit. The British Journal of Psychiatry. 164: 826-828.

Wickelgren, W. A. 1977, Speed-accuracy tradeoff and information processing dynamics, Acta Psychologica 41, 67-85.

Yudofsky, S., Silver, J., Jackson, W., Endicott, J., & Williams, D. (1986). The Overt Aggression Scale for the Objective Rating of Verbal and Physical Aggression. *The American Journal of Psychiatry, 143, 1, 35-39.*

Appendix A: Informed Consent Form

INVESTIGATOR INFORMATION

Shawn Hirsch, M.A.
434 Willard Hall
Oklahoma State University
Stillwater, OK 74078
(405) 744-5474

Consent to Participate in a Clinical Research Study

Study Title: Utility of the Youth Self Report and Adolescent Anger Rating Scale in Predicting Aggression of Adolescents in an Inpatient Sample

Sponsor: Marvin Jin, M.D.

Protocol No.:

INTRODUCTION

You and your adolescent are invited to participate in a research study conducted by Oklahoma State University and supported by Children's Medical Center Behavioral Health Services (A service of Tulsa Regional Medical Center) to better understand if adolescents' (ages 11-18) self report of their behavior will accurately predict how they will respond to inpatient psychiatric treatment. In particular, we are interested in knowing how their reports of behavior will predict aggressive behavior on the unit. Your adolescent will be given two self-report questionnaires and a brief interview, which will take approximately 45 minutes in total. Incidences of aggressive behavior will be documented for their first 14 days of treatment.

PROCEDURES

- Participation in this study will require no effort on your part (parent/guardian) save from reading and signing this consent form.

- Once your (parent/guardian) consent is obtained, the study will be explained to your adolescent after their admission to the unit and their participation will be strictly voluntary. If they refuse, no documentation of their decision will be placed in their chart, nor will it affect any treatment they receive, their length of stay, or their

placement upon discharge. If your adolescent assents to the study, they will be given the incentive of their choice of one item each from the soda and candy machines located within the hospital.

- All information given is completely confidential. When your consent and your adolescent's assent are obtained, your adolescent will be given an identification number. From that point on, all information collected regarding this study will be coded with that identification number.

- If both you and your adolescent agree to participate, he/she will be given two questionnaires designed to measure his/her beliefs about their behavior and anger. They will also be asked about their past history of aggression, exposure to violence, and if they have suffered abuse/neglect. This will take them approximately 45 minutes, and will not take them away from important treatment components of the program. Their behavior on the unit, in regard to acts of aggression, will also be monitored in order to compare it with the self-report measures. In all, their participation in this study will comprise their first 14 days of treatment.

RISKS

- There are no foreseeable risks involved in this study, since the only addition to the treatment they will receive is the addition of the two self-report measures. Again, this information will be recognized only by the use of the identification number, and all information used for the purposes of this study will be kept in secure storage at the principal researcher's office at Oklahoma State University. At the end of the collection period, all data collected for the purposes of this study will be destroyed.

- You and your adolescents' participation are completely voluntary. You and your adolescent are free to withdraw your participation from the study at any time.

BENEFITS

- This information could help hospitals predict which adolescents might display higher levels of aggression while in treatment and display more overall behavior problems, resulting in a greater length of stay and a more restrictive placement upon discharge. Once identified, this knowledge may aid in devising effective treatment and discharge plans, in addition to maintaining a safe, therapeutic milieu.

- Significant new findings developed during the course of the research which may relate to the subject's willingness to continue participation will be provided to the subject.

ALTERNATIVE TREATMENT

- This study will not provide any additional treatment, nor will it remove any treatment component that would be typically provided to your adolescent.

CONFIDENTIALITY

- All information given is completely confidential. When your consent and your adolescent's assent are obtained, your adolescent will be given an identification number. From that point on, all information collected regarding this study will be coded with that identification number.

- All information used for the purposes of this study will be kept in secure storage at the principal researcher's office at Oklahoma State University. At the end of the collection period, all data collected for the purposes of this study will be destroyed.

- Due to the fact that this study is conducted at Tulsa Regional Medical Center, the Food and Drug Administration may inspect the records.

COMPENSATION

- Adolescents who participate in this study will receive the incentive of their choice of one item each from the soda and candy machines located within the hospital.

- This study will not result in any additional costs to you or your adolescent.

SUBJECT RIGHTS

- If you have any questions about the study, you can contact the primary researchers of the study, Shawn Hirsch, M.A. and Terry Stinnett, Ph.D. at the School of Applied Health and Educational Psychology, 434 Willard Hall, Oklahoma State University, at (405) 744-5474.

- For additional information regarding subject rights, you may contact: Dr. Carol Olson, IRB Chair, Oklahoma State University, 415 Whitehurst, Stillwater, OK 74078. Phone: 405-744-1676 (colson@okstate.edu) or Tulsa Regional Medical Center's Institutional Review Board: Teresa Lienhop, IRB Chairman at (918) 599-5936.

VOLUNTARY PARTICIPATION

- Your participation and the participation of your adolescent are strictly voluntary. If you or they refuse to participate, no documentation of your/their decision will be placed in their chart, nor will it affect any treatment they receive, their length of stay, or their placement upon discharge.

- You and your adolescent are free to withdraw your participation from the study at any time, without penalty or loss of benefits, to which your adolescent is otherwise entitled.

WITHDRAWAL/PHYSICIAN REMOVAL

- If you or your adolescent choose to withdraw from this research study, you may inform the principle researcher and you will be promptly removed from the study. Any documentation collected for the purposes of this study will be destroyed.

CONSENT (Parent/Guardian)

I have read and understand the preceding information. I have had an opportunity to ask questions and all of my questions have been answered to my satisfaction. I am signing this form voluntarily indicating my agreement to participate in this study, until I decide to do otherwise. I understand that I will receive a signed copy of this agreement.

_____

Subject (adolescent) Name – Print

_____ _____

Signature of Parent/Guardian Date/Time

I certify that I have personally explained all elements of this form to the subject or his/her parent/guardian before requesting the subject or his/her parent/guardian to sign it.

_____ _____

Project director or authorized representative Date/Time

ASSENT (Adolescent)

I have read (or have had read to me) and understand the preceding information. I have had an opportunity to ask questions and all of my questions have been answered to my satisfaction. I am signing this form voluntarily indicating my agreement to participate in this study, until I decide to do otherwise. I understand that I will receive a signed copy of this agreement.

_____

Subject (adolescent) Name – Print

_____ _____

Signature of Subject (adolescent) Date/Time

I certify that I have personally explained all elements of this form to the subject before requesting the subject sign it.

_____ _____

Project Director or authorized representative Date/Time

Tulsa Regional Medical Center
Institutional Review Board
Addendum to the Informed Consent
(HIPAA Privacy Rule Authorization)

New federal privacy regulations have been enacted to protect the privacy rights of patients. As required by such regulations, this authorization form gives you more detailed information about how your personal health information will be protected. By signing this authorization form you agree that your personal health information (PHI) may be used by your doctor and his/her staff for research purposes and may be disclosed to Third Parties such as the Food and Drug Administration (FDA) and other regulatory agencies, and to organizations or people involved with processing the Institutional Review Board (IRB) overseeing the study. In addition, your PHI may be disclosed, without prior notice to you, in response to a valid order by a court or other governmental body as required by law. Once your PHI is disclosed pursuant to this authorization it may be redisclosed by the recipient and may no longer be covered by the federal privacy regulations, although other confidentially safeguards may apply.

Your PHI that will be used and disclosed in connection with the study may include your name and birth date and other demographic information, your medical records, medical history (such as diseases and medication), results of physical examinations, surgical and treatment information, photographs, and laboratory and diagnostic test results (c.g. mammograms and MRIs). This form allows the study doctor (identified in the consent from) and the Third parties identified above to use and disclose your records to treat you, to carry out the study as described in the consent form and for the advancement of medicine and clinical care. This authorization does not have an expiration date. Your PHI may be maintained in a research database.

Efforts will be made by all medical personnel and third parties to protect the confidentiality and security of your personal health information during and after the study. You have a right to obtain your PHI collected or used as part of the research study. You have the right to revoke your authorization and withdraw from the study, now or any time in the future by providing written notice to your doctor without loss of benefits, medical treatment or legal rights to which you are other wise entities. Even if you withdraw your permission, your PHI that was collected prior to your withdrawal of permission may still be used if the information is necessary to the study. If you do not sign this authorization you cannot participate in the study.

AUTHORIZATION

I have read and understand this addendum to the consent form as well as the original consent form and I authorize the release of my medical records and health information as relates to this study, including my signed consent form and this addendum , to the sponsor, the FDA, IRB and other regulatory agencies as described above. I voluntarily consent to be a research participant in this study and understand that I will receive a signed copy of this authorization for my records.

_____
Name of Participant

_____ _____
Signature of Participant Date

-Or-

_____ _____
Printed Name of Legal Representative Date

_____ _____
Signature of Legal Representative Date

Provide a brief description of the above person' authority to serve as the subject's authorized representative:

_____

Appendix B: Staff Consent Form

INVESTIGATOR INFORMATION

Shawn Hirsch, M.A.
434 Willard Hall
Oklahoma State University
Stillwater, OK 74078
(405) 744-5474

Consent to Participate in a Clinical Research Study

Study Title: Utility of the Youth Self Report and Adolescent Anger Rating Scale in Predicting Aggression of Adolescents in an Inpatient Sample

Sponsor: Marvin Jin, M.D.

Protocol No.:

INTRODUCTION

You invited to participate in a research study conducted by Oklahoma State University and supported by Children's Medical Center Behavioral Health Services (A service of Tulsa Regional Medical Center) to better understand if adolescents' (ages 11-17) self report of their behavior will accurately predict how they will respond to inpatient psychiatric treatment. In particular, we are interested in knowing how their reports of behavior will predict aggressive behavior on the unit.

PROCEDURES

- Your participation will consist of filling out a rating scale, which measures how many incidences of aggression (both verbal and physical) you have witnessed from a particular adolescent during the last seven days.

- On the 7th and 14th day of each participating adolescent's inpatient treatment, you will be given this rating scale, which is called the Retrospective Overt Aggression Scale (ROAS). Each rating should take approximately 2-3 minutes.

- The information you provide will be used to determine how well the self-report measures obtained from the adolescent predict how aggressive the adolescent actually is on the unit during his/her first 14 days of treatment.

- All information given is completely confidential. When your consent is obtained, you will be given an identification number. From that point on, all information collected regarding this study will be coded with that identification number.

RISKS

- There are no foreseeable risks involved in this study, except for the time that it takes to fill out each rating scale. Again, this information will be recognized only by the use of the identification number, and all information used for the purposes of this study will be kept in secure storage at the principal researcher's office at Oklahoma State University. At the end of the collection period, all data collected for the purposes of this study will be destroyed.

- Your participation is completely voluntary. You are free to withdraw your participation from the study at any time.

BENEFITS

- This information could help hospitals predict which adolescents might display higher levels of aggression while in treatment and display more overall behavior problems, resulting in a greater length of stay and a more restrictive placement upon discharge. Once identified, this knowledge may aid in devising effective treatment and discharge plans, in addition to maintaining a safe, therapeutic milieu.

CONFIDENTIALITY

- All information given is completely confidential. When you consent you will be given an identification number. From that point on, all information collected regarding this study will be coded with that identification number.

- All information used for the purposes of this study will be kept in secure storage at the principal researcher's office at Oklahoma State University. At the end of the collection period, all identifying data (participant consent forms) collected for the purposes of this study will be destroyed via a document shredder and disposed of through the hospital incinerator. All other data (protocols, interview forms, and non-identifying information) will be kept for a manditory 3 year period. No report of any type and no publication resulting from this research will identify the participants by name, birth date, or any other identifying information.

- Due to the fact that this study is conducted at Tulsa Regional Medical Center, the Food and Drug Administration may inspect the records.

SUBJECT RIGHTS

- If you have any questions about the study, you can contact the primary researchers of the study, Shawn Hirsch, M.A. and Terry Stinnett, Ph.D. at the School of Applied

Health and Educational Psychology, 434 Willard Hall, Oklahoma State University, at (405) 744-5474.

- For additional information regarding subject rights, you may contact: Dr. Carol Olson, IRB Chair, Oklahoma State University, 415 Whitehurst, Stillwater, OK 74078. Phone: 405-744-1676 (colson@okstate.edu) or Tulsa Regional Medical Center's Institutional Review Board: Teresa Lienhop, IRB Chairman at (918) 599-5936.

VOLUNTARY PARTICIPATION

- Your participation is strictly voluntary. If you refuse to participate, no documentation of this will be shared with your supervisors at Children's Medical Center Behavioral Health Services.

- You are free to withdraw your participation from the study at any time, without penalty.

WITHDRAWAL/PHYSICIAN REMOVAL

- If you choose to withdraw from this research study, you may inform the principle researcher and you will be promptly removed from the study. Any documentation regarding you that was collected for the purposes of this study will be destroyed.

CONSENT (CMC-BHS Staff)

I have read and understand the preceding information. I have had an opportunity to ask questions and all of my questions have been answered to my satisfaction. I am signing this form voluntarily indicating my agreement to participate in this study, until I decide to do otherwise. I understand that I will receive a signed copy of this agreement.

Subject Name – Print	Job Title
Primary Shift Assignment	Primary Unit Assignment
Signature of CMC-BHS Staff Member	Date/Time

I certify that I have personally explained all elements of this form to the subject or his/her parent/guardian before requesting the subject or his/her parent/guardian to sign it.

Project director or authorized representative	Date/Time

Appendix C: Historical Variables Clinical Interview Form

Clinical Interview Form

(yes/no answer format)

1) Have you ever destroyed your own or others' property?

2) Have you ever been physically aggressive toward others?

3) Have you ever verbally threatened another person?

4) Are you being raised in an intact household (both biological parents present or a parent/stepparent household)?

5) Have you ever suffered physical abuse and/or neglect?

6) Have you ever witnessed physical abuse of a family member?

Oklahoma DHS definitions of abuse and neglect:

"Abuse and neglect" means harm or threatened harm to a child's health or safety by a person responsible for the child's health or safety. Harm or threatened harm can occur through non-accidental physical or mental injury, sexual abuse, neglect, or failure or omissions to provide protection from harm or threatened harm.

"Neglect" means a situation in which the person responsible for the care of the child either deliberately or through exceptional lack of attention to the child's basic needs causes the child to suffer emotionally or physically. Neglect must involve either a chronic long standing problem that impacts several aspects of a child's life or the neglect must be so severe that it is life threatening. Children under the age of three years are most vulnerable to life threatening and significant developmental consequences from neglect. Poverty, alone, does not constitute neglect unless the person responsible for the care of the child does not access known and readily available resources to prevent serious emotional or physical harm to the child. Poor parenting practices that do not result in emotional or physical suffering are not considered neglect.

"Physical abuse" means physical injury, for example, bruises and fractures, resulting from punching, beating, kicking, biting, burning, or otherwise harming a child. Although the injury is not an accident, the person responsible for the care of the child may not have intended to hurt the child. The injury may have resulted from extreme physical punishment that is inappropriate to the child's age or condition. The injury may be the result of a single episode or of repeated episodes and can range in severity from significant bruising to death. Any action that involves hitting with a closed fist, kicking, inflicting burns, shaking, or throwing the child may be considered child abuse even if no injury was sustained if the action placed the child at risk of grave physical danger. Minor injury on a child older than ten would not be considered physical abuse unless the actions that caused the injury placed the child in grave physical danger.

"Sexual abuse" means rape, sodomy, incest, lewd or indecent acts, or proposals and sexual exploitation. Sexual exploitation includes allowing or encouraging a child to engage in sexual acts with others, prostitution, obscene photographing, filming or depicting of the child, and exposure to adult sexuality such as allowing a child to observe pornography or adult sex acts. In general terms, sexual abuse is any sexual activity, including sexual propositioning between the person responsible for the care of the child and the child or any acts committed or permitted by the person responsible for the care of the child for the purpose of sexually stimulating the child, the person responsible for the care of the child, or others.

http://www.policy.okdhs.org/ch75/Chapter_75-3/340-75-3/340_75-3-2._Definitions.htm

Oklahoma State University
Institutional Review Board

Protocol Expires: 10/9/2004

Date: Thursday, October 23, 2003 IRB Application No ED0426

Proposal Title: Utility of the Youth Self Report and Adolescent Anger Rating Scale in Predicting Aggression of Adolescents in an Impatient Sample

Principal Investigator(s):

Shawn Hirsch
434 Willard
Stillwater, OK 74078

Terry Stinnett
445 Willard
Stillwater, OK 74078

Reviewed and Processed as: Expedited (Spec Pop)

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are *unanticipated and impact the subjects during the course of this research; and*
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact me in 415 Whitehurst (phone: *405-744-5700, colson@okstate.edu).*

Sincerely,

Carol Olson, Chair
Institutional Review Board

VITA

Shawn Lowell Hirsch

Candidate for the Degree of

Doctor of Philosophy

Thesis: UTILITY OF THE YSR AND AARS IN DISCRIMINATING AGGRESSIVE VERSUS NON-AGGRESSIVE ADOLESCENTS IN AN INPATIENT SAMPLE

Major Field: Educational Psychology

Biographical:

Education: Graduated from North Caddo High School, Vivian, Louisiana May 1993; received Bachelor of Science degree in Psychology from Louisiana State University, Baton Rouge, Louisiana in May 1997; received Masters of Arts in Counseling from Oral Roberts University, Tulsa, Oklahoma in May 2000. Completed the requirements for the Doctor of Philosophy with a major in Educational Psychology at Oklahoma State University in July 2005.

Experience: Raised in Vivian, Louisiana; employed by Oklahoma State University, School of Applied Health and Educational Psychology as a graduate teaching assistant, 2001 to 2004. Employed by Girls and Boys Town, as a psychology intern, 2004 to present.

Name: Shawn Lowell Hirsch Date of Degree: July 2005

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: UTILITY OF THE YSR AND AARS IN DISCRIMINATING AGGRESSIVE VERSUS NON-AGGRESSIVE ADOLESCENTS IN AN INPATIENT SAMPLE

Pages in Study: 123 Candidate for the Degree of Doctor of Philosophy

Major Field: School Psychology

Scope and Method of Study: The amount of youth in the mental health care system, particularly in out of home placements, has dramatically increased over the last two decades. Youth aggression is both a significant societal problem not only in the settings of community, home, and school but also within inpatient facilities who treat youth with behavioral or emotional concerns. The goal of this study was to determine whether or not aggressive behavior of inpatient youth could be predicted, upon their admission, by the use of self-report measures of behavior and personality. 87 adolescents admitted to the inpatient psychiatric units of Tulsa Regional Medical Center, a hospital in Tulsa, Oklahoma were given a brief interview, the Child Behavior Check List Youth Self Report, and the Adolescent Anger Rating Scale. The Retrospective Overt Aggression Scale was used to gather information, via staff direct report as well as chart review, about the actual aggressive behaviors demonstrated by the youth in the study for the first two weeks of their stay.

Findings and Contributions: The results of this study indicated that higher levels of total aggressive behavior displayed on the inpatient unit by the youth were predicted by the construct of reactive anger. Higher levels of verbal aggression were significantly predicted by the combination of having a history of physical aggression and being raised in a non-intact household. The results of the study also indicated that aggressive youth could be discriminated from non-aggressive youth by the Oppositional Defiant Disorder scale of the Youth Self Report. The findings of this study could help inpatient units screen youth admitted to their programs to determine potential for aggressive behavior on the unit. This may lead to more specific and appropriate treatment planning as well as milieu management.

Advisor's Approval: Terry Stinnett, Ph.D.