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Broadening the Scope of Residential Treatment Outcome: The Information Processing and Object Relations of Externalizing Adolescents

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To the Graduate Council:

I am submitting herewith a dissertation written by Dennis Plant entitled "Broadening the Scope of Residential Treatment Outcome: The Information Processing and Object Relations of Externalizing Adolescents." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

Leonard Handler, Major Professor

We have read this dissertation and recommend its acceptance:

Richard Saudargas, Robert Wahler, Laurence James

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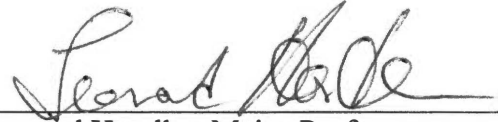
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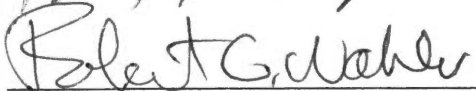
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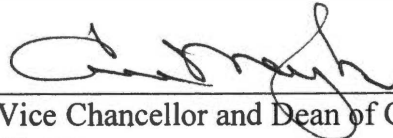


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Acceptance for the Council:



Vice Chancellor and Dean of Graduate
Studies

BROADENING THE SCOPE OF RESIDENTIAL TREATMENT OUTCOME:
THE INFORMATION PROCESSING AND OBJECT RELATIONS
OF EXTERNALIZING ADOLESCENTS

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Dennis Plant

May, 2004

DEDICATION

This dissertation is dedicated to my brother, Michael Plant.

“The community stagnates without the impulse of the individual. The impulse dies away without the sympathy of the community.”

-William James

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I wish to acknowledge every person in my life that has offered me support, encouragement and inspiration to accomplish this doctoral degree. I would like to recognize Dr. Leonard Handler for the steady, consistent mentoring he has provided and the belief he held in my talent and emotional capacity to be a psychologist. I would like to thank the members of my dissertation committee, Dr. Robert Wahler, Dr. Lawrence James and Dr. Richard Saudargas for their support, interest and advice they offered through the evolution of this work. Additionally, I would like to recognize the supervision that I received from Dr. Jack Barlow, Dr. Katherine White, and Dr. David Winecoff that has enriched and deepened my personal and professional life. I would like to thank them for the tremendous wells of inspiration they have provided.

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ABSTRACT

Experimental and clinical research has discovered certain qualities of information processing and object relations to underlie externalizing behavior disorders in adolescence. The purpose of this study was to test the hypotheses that adolescents with externalizing behavior disorders demonstrate distinct and clinically significant information processing tendencies and object relations than non-patient adolescents. Additionally, this study aimed to investigate changes in information processing and object relations among this sample through treatment at a residential treatment center. Finally, this study tested the hypothesis that information processing and object relations changes underlie changes adolescents make in their social behavior as a consequence of psychological treatment.

The 49 participants of this study were recruited from a group of patients admitted to a residential treatment center in eastern Tennessee. The participants were administered the Rorschach Inkblot Method, Minnesota Multiphasic Inventory, Adolescent Version (MMPI-A), and Child Behavior Checklists were rated by staff (CBCL) at admission and discharge.

Results of the study indicated that the majority of information processing and object relations variables on the Rorschach (X-%, F%, ZD, DQC, MOA and AGC) varied significantly from non-patient peers and were consistent with previous samples of age-related adolescents with externalizing behavior disorders. Indices on the MMPI-A (CYN, CON, ANG, and ALN) did not significantly differ from age-matched normative samples, however. When the information processing and object relations of this sample was assessed for changes made upon the Rorschach, MMPI-A and CBCL variables,

significant changes were found to have occurred. The participants made significant behavioral changes as indicated by CBCL scales SOC, AGG, and DEL and made improvements on roughly half of the MMPI-A and Rorschach variables. However, only one of the four information processing variables on the Rorschach, ZD, was found to alter after treatment.

Finally, results indicated MMPI-A changes, but not Rorschach changes, were statistically predictive of behavior changes. Specifically, changes participants made upon scales CON and CYN were highly associated with diminished aggressive behavior and social problems, respectively. The results are discussed in light of the on-going concern that psychological intervention may address dynamic aspects but not structural aspects of personality, especially during briefer treatments.

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CHAPTER 1

LITERATURE REVIEW

Introduction

What makes a child behave badly? The question has generated an immense body of research by psychologists, and has made children and adolescents with externalizing behavior problems the focus of enormous investigative scrutiny. Searches for answers to this question have taken on many different forms. A great deal of research has focused upon the great heterogeneity of externalizing behaviors, and sought to clarify an amorphously defined group of pathology by identifying reliably occurring subtypes of externalizing behavior disorders. Other research has centered upon various psychological, biological and social etiologies of children who display later conduct problems. This has helped elucidate numerous risk factors and potential causal mechanisms involved in the development of pathology. Another line of inquiry has searched for various neurobiological, emotional and cognitive processes that are proximally responsible for aggressive and delinquent behavior.

This chapter is intended to examine research emerging from social cognitive perspectives of childhood and adolescent externalizing behavior disorders. More specifically, the literature investigating the effects of information processing operations upon sociopathic and aggressive behavior will be examined. This chapter will describe research findings that have led to a discovery of the association between aggressive behavior and particular deficits in various cognitive and emotional operations. Finally, this section summarizes recent work investigating distal factors believed to be

responsible for the development and consistency of these cognitive and emotional information processes. To begin, a description of the most recent model of social information processing is offered.

The Social Information Processing Model

Social cognitive theorists have conceptualized an information-processing model that describes cognitive and emotional processes proximally responsible for aggressive behavior in children and adolescents (Huessman, 1989, Crick & Dodge, 1995). These mental operations include sequential steps wherein the individual perceives and interprets social events, and later formulates and evaluates what behavior to later enact. Aggressive behavior is understood to emerge from a failure or deficit in one or more stages of these processing steps. The set of processes will be briefly articulated below.

The first step involved in processing novel social information is described as the *encoding stage*. This stage refers to mental operations involved in filtering and encoding perceptual information. These skills include the process of visually scanning the social environment, selectively attending to and filtering out information, and storing encoded information into short-term memory.

After stimuli are encoded, the individual attributes meaning to the perceived information, a cognitive and emotional process referred to as the *interpretation stage*. People make meaning of social information in a number of ways. Individuals try to determine the causes and meaning of a social event, attribute the intent of other actors in the situation, and evaluate the role they play in their milieu. These interpretations are partially informed by the participants' general perceptions of themselves and other

people. The net result of this process is a mental representation of the perceived information, which is used for subsequent decision making and may be formed as an event in long-term memory.

The prior stages have largely entailed the input of social information-- taking in and interpreting social information. The stages that follow elucidate the output of social action-- the processes by which an individual emotionally and cognitively responds to, and eventually acts upon their environment. The social information-processing model describes the *clarification of goals* as the initial step in this sequence. While prior processing stages influence this step, it involves unique mental operations itself.

Typically, individuals begin the process of selecting responses to the social event that has been scanned and interpreted. Goals people hold for social interactions include the attainment of an internal, emotional state (e.g., security, avoidance of shame, feeling of revenge) or an external, instrumental or relational goal (getting the biggest piece of cake, avoiding a fight with a peer).

Once a goal has been set, the individual determines ways to behave in order to obtain said goal. The mental operations entailed in this stage have been described as the *response access stage*. During this stage, the individual accesses potential behavioral responses or strategies they have in their repertoire (i.e., ways to act recalled from long-term memory) in order to attain the goal they have formulated. People are believed to vary considerably in the number, type (e.g., aggressive, submissive, assertive, cooperative) and quality (e.g., competency, relevancy) of responses they have at their disposal.

After accessing behavioral responses from memory, the individual then must come to a decision upon which of the accessed behaviors would best suit their purposes. Termed the *response decision stage*, the person evaluates the potential responses along a number of dimensions including: 1) the content of the response, which is based upon values, beliefs and social expectations, 2) the likely outcome of the response 3) evaluation of how effective one will be in performing behaviors to obtain the desired outcome. Combined, the decision stage results in a chosen behavior to then *enact*.

Rather than these stages acting in isolation of one another, they are understood to assert mutual influence and effects on each other. For instance, one can only interpret the social information that is successfully perceived, attended to and encoded into short-term memory. Likewise, the number of responses that are accessed by the individual will determine one's evaluations regarding potential behavioral decisions. In the following sections, these stages are examined and reviewed independent of one another. This is done to meaningfully organize distinct mental operations, as well as to elucidate connections between the specific operations and social behavior. While meaningfully related to one another, the processing stages have proven to be constructs that, when measured, are internally consistent and reliably distinct from one another (Dodge, Laird, Lochman & Zelli, 2002).

Correlates between Information Processing Deficits and Externalizing Behavior

A considerable amount of empirical work has been undertaken to investigate variations in these processing stages. The majority of work has focused upon identifying processing deficits and biases among individuals identified as socially maladjusted or

aggressive. A smaller set of research has attempted to experimentally link faulty cognitive operations to displays of aggressive, socially incompetent behavior or attitudes that might lead to such behavior. This section summarizes the accumulated research that exists for each processing stage. Since this paper is concerned primarily with the information processing tendencies underlying disruptive and aggressive behavior, the majority of studies reviewed are made up of samples identified as aggressive or are those that have utilized aggressive behavior as the dependent variable of measurement. “Aggression” in these studies, unless otherwise indicated, has been defined as acts of verbal or physical hostility, intimidation and a wide range of assaultive actions.

Encoding Stage

A number of studies have investigated how aggressive children and adolescents encode social information. The majority of studies have taken the form of selecting groups rated as aggressive and non-aggressive and determining group differences among them with regard to various encoding factors. In other cases, investigators have attempted to assess direct links between encoding deficits and subsequent displays of aggressive behavior or aggressive attitudes.

Studies have typically gone about examining differences between aggressive and non-aggressive groups by asking participants to view videotape or read a story about a hypothetical social scenario. Following the story, participants are asked to recall what events had taken place. The recalled events are tabulated and examined to give an index of the quantity and quality of information that has been encoded.

When compared with non-aggressive children, children who are rated as aggressive have consistently been found to encode less information about the events they witness (e.g., Dodge & Tomlin, 1987, Dodge & Newman, 1981, Dodge, Pettit, McClaskey, & Brown, 1986). Furthermore, they tend to use less information from these social scenarios in order to make interpretations of social situations than do non-aggressive children. This holds true across a number of social scenarios of varying emotional valence. For instance, they have been found to encode less information when compared with normal children in aggressively loaded situations (being provoked by a peer group) or in a relatively neutral social situation (entering into a group to play a game).

In addition, aggressive children are particularly deficient at recalling information that occurs early in social situations, and instead tend to recall and rely upon data that are presented at the end of a situation (Dodge & Tomlin, 1983). In other words, aggressive children appear less adept at encoding initial events in social situations, but are as capable as non-aggressive children in recalling those events occurring closer to the end. These data have led investigators to conclude that aggressive children suffer from a “cue-utilization deficiency”, which appears to lead such children to later distortions in their information processing, such as making biased interpretations of social events based upon limited information (see Milich & Dodge, 1984).

The inability to encode an adequate amount of perceptual information has led to the contention that aggressive children suffer from memory and attention problems (Crick & Dodge, 1994). Furthermore, age has been found to have an effect upon cue detection and utilization (e.g., Dodge et al., 1986, Dodge & Newman, 1981). From these

findings, it is posited that aggressive children may suffer from a developmental deficit in their attention and short-term memory capacities. As children age, they become faster, more systematic and exhaustive in their scanning for perceptual information, yet it appears that aggressive children lag behind in each of these areas throughout development (Pettit, Polaha & Mize, 2001). The encoding deficits among aggressive children and adolescents have proven to remain significant even when intelligence has been statistically controlled (e.g., Coy, Speltz, DeKlyen, & Jones, 2001, Lochman & Dodge, 1994).

Aggressive children appear to struggle in other ways within the encoding stage. It has been argued that aggressive samples are inordinately drawn toward social cues of a hostile or aggressive valence (Strassberg & Dodge, 1983, Coleman & Kardash, 1999). Support for this contention has so far been mixed. When comparing them to a group of age-related, non-aggressive peers, Gouze (1987) found aggressive grade-school boys were more likely to attend to social information of an aggressive valence than of a neutral valence. In addition, the aggressive group had more difficulty diverting attention away from aggressive cues and was more likely to be distracted from other social stimuli by stimuli of a hostile valence. Vigilance of hostile information seems to have the effect of preventing aggressive children from recognizing cues of a more neutral or benign nature, thereby leaving them with unbalanced proportions of “negative” information for which to interpret social situations.

Other investigations, however, have found that aggressive children attend to hostile and aggressive social information at levels equal to their peers. What these investigations have instead found is that such samples do not attend to neutral

information well enough (e.g., Dodge & Frame, 1982, Milich & Dodge, 1984). For instance, Milich and colleagues (1984) investigated the recall capacities of a clinically-referred group of children rated as highly aggressive and hyperactive. This group was compared with other clinical referrals and a group of non-patients in their ability to recall social information of varying valence (hostile, benign, or neutral) within videotaped scenarios. The hyperactive/aggressive group, when compared with non-aggressive control group, tended to recall fewer neutral cues of information, but remembered an equal amount of negative and positive cues. And as was the case with several of the studies previously mentioned, the hyperactive/aggressive group used less information as a whole from the social scenarios to base interpretations of the events.

Rather than the amount of information being of central importance within the encoding stage, certain studies have found the accuracy and relevancy of information encoded seems to best separate aggressive children from controls. For instance, when presented with hypothetical social scenarios, aggressive children have been found, in two studies, to attend to less socially meaningful information than comparison groups (Dodge, Pettit, Bates, & Valente, 1995, Dodge & Frame, 1982). One of these studies found that aggressive and non-aggressive boys encoded similar amounts of hostile, benign and neutral information when watching videotaped social interactions of peers, but displayed inaccuracies and distortions in their information retrieval. (Dodge & Frame, 1982). The aggressive children more often reported events that had not actually occurred on the videotape, but were fabricated by the individual. Similarly, when asked to correctly identify whether an event had or had not occurred in videotaped scenarios, the aggressive boys were more likely to make “false positive” errors than were non-

aggressive boys. That is, they more often mistakenly claimed that incidents not seen on the videotape, but instead, invented by the examiner had actually occurred on the videotape.

Developmentally, encoding problems appear deficient among aggressive samples on into adulthood. In a study examining information-processing differences among adolescent groups rated severely violent, moderately aggressive or non-aggressive, the number of relevant perceptual cues varied as a function of group membership (Lochman & Dodge, 1994). The violent group had significantly fewer relevant cues than both the moderately aggressive and non-aggressive group, while the moderately aggressive group had encoded significantly less information than the non-aggressive youths. Slaby and Guerra (1988) found that clinically referred, antisocial adolescents are apt to use less information to interpret a social situation than are non-patient adolescents, while aggressive non-patients were found to rely upon less information than the non-aggressive adolescents.

Despite a few studies that contradict the claim, the finding that aggressive children attend to less relevant and fewer social information cues seems to be a consistent and durable finding (Dodge, Bates, & Petit, 1995, Harrist, Zaia, Bates, Dodge, & Pettit, 1997). Importantly, some studies have been able to link deficits in encoding relevant information with behavioral problems months and even years later in life, even when controlling for the effects of problems in other stages of the information processing chain (Dodge et al., 1995, Dodge, 1990).

More recently, investigators have found encoding deficits to be associated with particular forms of aggressive behavior. Researchers have become increasingly aware of

the importance of delineating between reactive and proactive forms of aggression (see Dodge & Coie, 1987 for a further elaboration and empirical demonstration of the distinction between the two). It has been demonstrated that many children and adolescents demonstrate one type of aggressive behavior, but little of the other, and that they perhaps reflect separate developmental pathways toward conduct problems. In response to these findings, investigators have begun to search for information processing variations among these posited subtypes of aggressive samples, including those within the encoding stage. So far, this line of research has proved fruitful; encoding errors have been found to occur frequently in individuals who are rated as reactively aggressive but seldom in those defined as proactively aggressive. Importantly, this finding is consistent across samples of adolescents and children (Crick & Dodge, 1996, Dodge, Lochman, Harnish, Bates, & Petit, 1997).

To summarize the most reliable findings within the encoding stage, aggressive children and adolescents, particularly those who behave in a reactive aggressive manner, differ significantly from non-aggressive children in their capacity to recall social information of a benign or neutral nature. This often leaves them with a preponderance of hostile or aggressive social information from which to draw. Put another way, the tendency to focus on an abundance of negative information makes them more likely to understand their world as hostile or unfriendly.

Why aggressive children focus more upon hostile information and disregard neutral information is of great interest to those studying the etiology of externalizing behavior disorders. Borrowing from the attachment literature, researchers have speculated that internal working models of relationships may play a figural role in

determining this and other processing tendencies. Within the encoding stage, latent knowledge structures or internal working models accessed by these samples are thought to selectively filter social information based upon past, figural attachment relationships (Pettit, Polaha, & Mize, 2001). Furthermore, the finding that more distortions occur and less relevant information is encoded among aggressive individuals suggests that they may rely more heavily upon these internal working models than on information that is presented within the actual situation (Dodge & Tomlin, 1987).

Interpretation Stage

The links between the interpretations children and adolescents make about social situations has been the most extensively investigated of any information processing stage. This body of work has largely focused upon the attributions aggressive children and adolescents make about others intentions in social situations. Typically, these studies involve presenting individuals with hypothetical social scenarios in picture or videotape format, and in some cases, live action situations in which the subjects themselves participate. Following the situations, subjects are asked how they interpreted the intent of the other actors in the scenario. From this work has emerged a robust finding that aggressive children and adolescents are more likely than their peers to attribute hostile intent to actors in ambiguous, provocation situations. This tendency has been termed the “hostile attribution bias” (Nasby, Hayden, & DePaulo, 1979).

Additionally, aggressive children and adolescents are prone to misinterpret the intentions of others as hostile even when the other’s intent is portrayed deliberately as benign or non-hostile (Dodge & Somberg, 1987, Dodge et al., 1986). Aggressive

children do not, however, make more hostile interpretations than normal children when the actor is intended to act hostile, and they do not make the incorrect interpretations of events in other ways besides hostile ways (Waldman, 1996). Waldman concluded from this that aggressive children do not suffer from gross, general misinterpretations of reality, but instead are seemingly biased toward aggressive interpretations. Furthermore, the effects of the hostile attribution biases among aggressive children and adolescents remain after controlling for other possible confounds such as intelligence level and impulsivity/attention problems (Dodge et al., 1984, 1990, Waldman, 1996).

The attribution of hostile intent has been strongly associated with the likelihood of aggressive responses to situations, independent of the actual intent of the provocateur (Dodge, Murphy & Buchsbaum, 1984). The hostile bias is thus believed to play a strong causal influence upon later aggressive behavior. A few studies have lent support to this contention. One study demonstrated that hostile attribution biases in preschool children predicted the onset of aggressive behavior problems six months later (Dodge et al., 1990). Hostile attributions in the first, second and third grades were also found to be predictive of externalizing problems later in the third and fourth grade (Dodge et al., 1995). Finally, a study that manipulated children's expectancies about a peer actor's intent found that the manipulation successfully altered the children's interpretations about the intent of the actor's behavior in a later experiment (Rabiner & Coie, 1989).

The term "hostile attribution bias" was initially coined in a Nasby, Hayden and DePaulo study (1979). The study examined the relationship between levels of aggression in children aged 10-16 and the tendency to attribute negative-dominant (i.e., hostile) attributions to individuals in neutral social situations that were presented to individuals

during the experiment. The study found ratings of aggression among the individuals were positively associated with the tendency to erroneously attribute hostile intentions to the presented information. Dodge (1980) replicated this outcome in a separate study of grade school children. However, Dodge found this bias occurred only within situations that were intended to be ambiguous to the sample; the bias did not exist when the depicted scenarios were clearly benign or clearly hostile.

This finding has held up in a number of replicated studies with school aged children. Guerra and Slaby (1989) noted that boys rated as aggressive were more likely to attribute hostile intentions to others only within ambiguous situations. Waas (1988) found that third and fifth grade boys rated as aggressive and socially rejected were more likely than non-aggressive, socially accepted peers to make hostile attributions to social situations in which there was a limited amount of information about an individual's intent. However, the two groups were similar in their intent attributions in those situations in which there was an adequate amount of social information available for them. Similarly, Graham, Hudley and Williams (1994) found differences between aggressive and non-aggressive Latino and African-American middle-schoolers in hostile intent attributions only within ambiguous social scenarios, and not within situations that were defined as pro-social, accidental and or hostile.

Studies have extended these findings to adolescents across clinical, incarcerated, and student populations. Slaby and Guerra (1988) found that male and female adolescents incarcerated for aggressive offenses were more likely to perceive hostility in ambiguous social situations than high school adolescents rated either as highly aggressive or non-aggressive. The difference held across the two groups who were distinguished

more subtly; the students rated as highly aggressive made more intent attribution errors relative to the students rated low in aggression. In a separate study of severely violent, moderately aggressive and non-violent adolescents, the number of hostile attributions was found to successfully discriminate the severely violent group from the other two groups (Lochman & Dodge, 1994). However, violent adolescents were found to have significantly higher levels of hostile attributions than their less aggressive peers only among situations involving an individual that approximated their age. Interestingly, they did not demonstrate the same bias when presented with a scenario that involved an authority figure. This study also demonstrated that the number of hostile attributions was an important discriminator among violent, moderately aggressive and non-aggressive preadolescents, suggesting that intent biases are an enduring characteristic across the life-span of individuals with histories of violent behavior.

Hostile attribution biases may be at play within certain social situations but not in all of them, nor do children labeled as aggressive act aggressively across a variety of situations. One study found that aggressive children make hostile attributions only in those situations in which they themselves are included as subjects (Dodge & Frame, 1982). Put another way, they do not tend to attribute hostile intent in situations when witnessing a peer committing an ambiguously provocative act upon another peer.

Likewise, hostile attributions seem to be made within certain social contexts but not others (Dodge et al., 1986, Dodge & Newman, 1981). Aggressive children have been found to commit hostile attribution biases at a greater frequency than their peers in situations where another peer commits an aggressive act of ambiguous intent towards them. However, the two groups appear similar in their attributions of others intent in

more neutral situations, such as trying to enter into an activity with peers. Likewise, while children who demonstrate attribution biases in provocative contexts are more likely to respond aggressively within provocative social situations, they are not any more prone than peers to behave aggressively in non-provocative social contexts.

This finding has led some to contend that aggressive children tend to be more primed for perceiving threats than their peers, creating marked distortions in their interpretations of social stimuli. Dodge & Somberg (1987) demonstrated support for this contention by manipulating threatening or relaxed environmental conditions in an experiment assessing the differences of hostile attributions between groups of aggressive and non-aggressive boys. The aggressive group was found to vary significantly from the non-aggressive group in the number of hostile attributions made to a peer's intent only under the manipulated threat condition, not during the relaxed condition.

Further support is evidenced by the fact that hostile attribution biases appear linked to reactive forms of aggression but not to instrumental forms of aggression (Crick & Dodge, 1996, Dodge & Coie, 1987, Dodge, et al., 1997). For instance, Dodge and Coie (1987) found that children who were rated as reactively aggressive made higher proportions of hostile attributions to hypothetical social scenarios than did those demonstrating proactive forms of aggression. Interestingly, those children rated as proactively aggressive did not differ from children rated as non-aggressive in the amount of hostile attributions they made.

A study of adolescent male juvenile offenders found that hostile attribution biases were correlated with the DSM-III diagnosis of Undersocialized Aggressive Conduct Disorder (as distinguished from Socialized Conduct Disorder), staff ratings of reactive-

aggressive behavior, and the number of interpersonally violent crimes committed (Dodge, Price, Bachorowski, & Newman, 1990). However, hostile attribution biases were not correlated with Socialized Conduct Disorder (covert delinquency) or non-violent crimes. Thus, attribution biases appear to underlie different dimensions of conduct disorder diagnoses and certain types of aggressive behavior. They appear related to reactive, overt displays of aggression but not with instrumental or covert acts of aggression.

Indicators of distortions in the interpretation stage other than hostile attribution biases appear in the literature, albeit in far less frequency. In a study of depressed, aggressive and normal school age children, the depressed and aggressive groups made similar amounts of hostile attributions biases (Quiggle, Garber, Panak, & Dodge, 1992). However, the depressed group tended to attribute the *causes* of social events to themselves more than did the aggressive group. The aggressive children understood negative social outcomes as having occurred due to external causes beyond their control (in the case of this study, they rated other people as the cause of negative outcomes) rather than related to their own actions. Aggressive samples appear more prone to externalizing blame for events than are other groups.

Another study investigated the differences among aggressive and non-aggressive children in their interpretations of their own and others' behavior (Lochman & Dodge, 1998). This is an interpretation process distinct from those of intent, in that subjects are asked to assess their and their peers' *actual behavior* in a situation. Aggressive and non-aggressive adolescents and preadolescents were found to hold quite different understandings of their own behavior and those of their peers. Within a series of experimentally manipulated social interactions, independent judges rated the amount of

aggressive behavior occurring among a sample of aggressive and non-aggressive grade school children. Compared to the judges' ratings, aggressive boys over-estimated the aggressive behavior displayed by peers but under-estimated the amount they displayed. Non-aggressive boys did the opposite; they over-perceived their own aggression and under-perceived the aggression of peers compared to the judges' perceptions (Lochman & Dodge, 1998).

The study also examined the differences upon which the two groups based their interpretations of their own behavior. Prior to the social interactions, the children were asked how aggressively they expected themselves to act in the upcoming situation. Results indicated that the aggressive group post-hoc ratings of their own behavior were associated more closely with their expectations of how they would behave rather than the behavior they later displayed (Lochman & Dodge, 1998). In other words, the aggressive groups' ratings of themselves matched their predictions instead of their actual behavior. This differed from the non-aggressive group who was more capable of tying their evaluations of themselves to their actual behavior.

In summary, hostile attribution biases appear to be a consistent quality of aggressive children's processing styles, particularly those rated "reactively aggressive". Attributions of hostile intent appear more often in ambiguous social scenarios, but stronger distortions occur when the intent of an actor is clearly benign or neutral. However, at least two conditions seem to strongly affect the likelihood that an aggressive individual will attribute hostility differently than a non-aggressive individual. First, it is much more likely to occur in provocative social situations, or ones of marked ambiguity.

Secondly, attribution biases appear to occur only when the aggressive individual is a participant in the interaction himself or herself, not a third-party observer.

These studies have led theorists to investigate the role that latent, long-standing, and enduring social schemas or internal working models about interpersonal relationships appear to play in this interpretation stage. As was discussed in the encoding stage, individuals with chronically accessible, hostile knowledge structures may be more likely to fill in the “information gaps” in the interpretation stage with hostile attributions of others’ intent (Crick & Dodge, 1996) based upon implicit cognitive and emotional schema of human relationships. The finding that biases occur more often when the provocateur’s intent is ambiguous versus when the intent is clear, and that the misinterpretations are of a hostile rather than non-hostile valence seem to point to their pre-existing notions about relationships. Due to the lack of clear or sufficient information, ambiguous situations call for the use of an individuals own history or “latent knowledge structures” to make sense (or interpret) the social situation.

Additionally, these studies have led more recent researchers to question the role emotions have, rather than just cognition, in the interpretations aggressive children make. Highly emotionally reactive children appear to make distorted interpretations in emotionally charged situations that have direct relevance to them far more often than other children. Thus far, the role of emotion in information processing has been a relatively neglected area among social cognitive scientists (see Dodge & Somberg, 1987 or Quiggle et al., 1992 for some exceptions to this). However, recent studies have contended that “on-line” information-processing is bypassed during emotionally evocative situations, leaving individuals reliant upon automatic scripts or schemas to

provide reflexive interpretations of such events (Crick & Dodge, 1994). More reactively aggressive individuals appear much more likely to rely upon these unconscious, knee-jerk interpretations that are determined by internal working models that anticipate hostility.

Goal and Outcome Formulation Stage

According to the information-processing model, behavior is enacted to attain goals that individuals formulate for themselves within social interactions. It is posited that aggressive children and adolescents hold goals or desire social outcomes distinct from their peers, and often, inappropriate to the situation. Investigation into the differing goals of children with externalizing behavior problems has been the focus of fewer studies than the other information processing stages. However, samples of socially rejected children and adolescents along these lines has been investigated and bears relevance to the information processing problems of externalizing children and adolescents.

Asking children what outcomes they desire within hypothetical social scenarios or to choose a desired social outcome among a list of alternatives is typically the manner in which goals or outcomes are studied. Investigators have consistently found that children and adolescents who are rated as “socially successful” formulate social goals that are pro-social in nature and highly relevant to the situation at hand. On the other hand, those rated as less socially adaptive tend to construct goals that are damaging to relationships, such as being overly competitive or controlling, and less relevant to the interaction (Crick & Dodge, 1989, Renshaw & Asher, 1983, Taylor & Asher, 1989). These differences

exist despite the fact that these groups appear to equally value their relationships with others (Taylor & Asher, 1989).

An additional finding from the body of literature of socially successful versus socially unsuccessful children bears mentioning. While popular and unpopular children seem to differ in their independent formulation of goals to social situations, they tend to be equally capable of recognizing appropriate social goals when they are presented. Furthermore, if given the choice between appropriate and inappropriate goals, the groups are equally likely to choose appropriate goals. In other words, the two groups are likely to be motivated to act in pro-social, situationally-relevant ways if offered the choice (Renshaw & Asher, 1983, Crick & Dodge, 1996). The difference seems to lie in the varying capacity of the two groups to independently formulate such goals.

Of the limited amount of investigations into differences between aggressive and non-aggressive groups upon goal formulation tendencies, findings in the expected direction have occurred. One study examined the varying goals for hypothetical social situations held among groups of incarcerated adolescents and high school students rated highly aggressive and non-aggressive (Slaby & Guerra, 1988). The scenario described a same-sex, unknown peer that, for reasons made unclear, interferes with a personal-instrumental goal of the participant (e.g., getting a piece of cake from a plate). The incarcerated group was more likely than the non-aggressive group to select hostile goals (e.g., seeking retaliation or retribution) by which to respond to the perceived frustration.

Erdley and Asher (1996) found that aggressive groups of children vary considerably from withdrawn and pro-social groups in the social goals they hold for ambiguous provocation scenarios. The aggressive children were found to be more

interested in punishing the provocateur, defending themselves, and were relatively unconcerned with arriving at a constructive agreement or maintaining a relationship at the end of the situation. The difference between aggressive and withdrawn children seems particularly important, in that both groups are considered to be “socially unsuccessful”. While both groups tended to come up with desired goals at odds with their social milieu (i.e., unsuccessful), it appears that the *content or quality* of the goals is significantly more hostile or aggressive among aggressive children.

Finally, Crick and Dodge (1996) investigated the differences between children described as “reactive aggressive” and “proactive aggressive” with regard to their self-reported social goals. The two groups of children were shown videotapes of various social situations, and asked if they preferred a positive instrumental outcome (e.g., the attainment of an object) or a positive relational outcome (e.g., improved relationship with a peer). During conflict situations, reactive aggressive children were more likely to wish to act in a way that maintained positive social relationships, while proactive aggressive children were more apt to choose more non-relational, self-enhancing goals. Proactive aggressive children appear to formulate goals emphasizing attainment of non-social ends at the expense of relationships, a finding that is atypical among reactively aggressive children. While the reactively aggressive children may act as aggressively, it is probably related in part to their automatic formulations toward achieving antisocial goals- perhaps a part of their automatic tendency to attribute hostility and their general emotional reactivity. When directed toward more pro-social aims, they appear more apt to respond pro-socially (Crick & Dodge, 1996). In contrast, proactively aggressive children prefer

instrumental goals even when alerted to the option of more appropriate or relational goals.

Taken together, these studies seem to suggest that aggressive children and adolescents vary greatly from their peers in the goals they formulate for social situations, even peers that are socially “unsuccessful”. However, there may be some variation within aggressive groups regarding the mechanisms that underlie these goals. In the case of reactively aggressive children, it seems that they reflexively come up with aggressive goals to various scenarios. When given more pro-social, appropriate alternatives, they tend to choose them. In fact, reactively aggressive children place great importance in being liked and becoming socially competent (Crick & Dodge, 1996). That reactive aggressive children “automatically” come up with more antisocial goals may be yet an artifact of latent working models of hostile relationships, and/or distortions that have occurred in previous processing stages. Anticipating hostile relationships, encoding hostile information and interpreting hostility all may lead these individuals towards goals that are retaliatory in nature.

The proactively aggressive group may have all together different mechanisms underlying their social goals. Their goals appear to be the result of calculated, conscious decisions unaffected by emotional reactivity or disruptions in the information processing of previous stages. Internal working models among these individuals that take on a decidedly different tone and valence may explain this variance. The schemata of relationships seem likely to include others as seen as devalued, and themselves as detached or disinterested in the attachment between them and their object.

Response Accessing Stage

After formulating a desired outcome to a social situation, the individual begins to formulate how to achieve this goal. According to the information-processing model, the process involves attempts to access “behavioral responses” (i.e., behaviors that they imagine might lead to some goal) from long-term memory. Difficulties generating multiple responses to social problems and an inability to access competent responses with a corresponding preponderance of aggressive responses have both been thought to characterize the accessing tendencies of aggressive children.

Several studies have investigated the capacity for aggressive children and adolescents to effectively access responses. They have been assessed with regard to the quantity of behavioral responses they can successfully access, the quality of the responses- largely through studying the amount of incompetent or aggressive content within the responses-, and the order in which particular types of responses are accessed. Experiments typically take the form of presenting a hypothetical social scenario, followed by a series of questions in which participants are asked to come up with ways they could respond to it. Between-group comparisons of aggressive and non-aggressive children along the three domains just discussed are typically the focus of inquiry. In order to control for confounds from previous processing stages, social scenarios are presented in an explicit, non-ambiguous manner, thereby bypassing possible encoding and interpretation errors as well as variations in social goals that may affect this stage.

Shure and Spivak pioneered the investigation of response accessing and were among the first to speculate that appropriate social behavior is contingent upon an

individual's ability to generate a number of solutions to social dilemmas (Shure & Spivak 1974, 1980). They examined the benefits of a cognitive problem-solving treatment for preschoolers, which focused upon helping troubled children conceptualize multiple ways of responding to problematic social encounters. When compared with a control group of troubled preschoolers, the treatment was found to enhanced the experimental groups' ability to come up with adaptive behavioral responses to hypothetical social situations. The change was highly correlated with decreases in actual problem behavior (defined in this study as aggressive, impulsive or emotionally reactive acts). Children who were defined as not having improved behaviorally were less likely to increase the number of solutions they could generate. Importantly, the investigators were able to rule out other possible effects the treatment could have had on the children. Cognitive skills such as an increased ability to hypothesize consequences of one's behavior or to understand the cause and effect of interpersonal relationships did not prove to separate the improved group from the unimproved group (Shure & Spivak, 1980). Additionally, the study demonstrated that the ability to generate more solutions was not associated with the intelligence of the child.

These findings have extended further into the life-span of aggressive samples. In fact, there may be a more noticeable difference in response accessing between aggressive and non-aggressive groups as they enter adolescence (Slaby & Guerra, 1988). One investigation found that adolescents with a history of criminal offenses came up with far fewer responses to frustrating social situations than did high school groups rated high in aggression and low in aggression. While the highly violent group was less capable of generating an initial effective solution to a problem situation, what appeared most

problematic was their inability to generate any alternative solutions beyond their initial one. Put another way, this sample had a hard time not only coming up with a quality response, but could not come up with alternative responses from which to choose. The paucity of responses aggressive adolescents have at their disposal has been confirmed elsewhere. In a separate study comparing a severely aggressive, moderately aggressive, and non-aggressive adolescent sample of boys, the total number of adaptive solutions each sample generated was the variable that best discriminated the severely aggressive group from the other two groups (Lochman et al., 1994). In contrast to the Slaby and Guerra study, however, the groups did not vary in the number of aggressive or irrelevant responses they generated.

A number of studies, however, have suggested that aggressive samples are hindered by the quality of their responses more than they are by the quantity of their responses. Several investigations have demonstrated that aggressive samples have access to a sufficient number of solutions to many social dilemmas, but the responses they access tend to be highly aggressive. Deluty (1981) found that aggressive elementary school children did not differ from non-aggressive children in their ability to generate a number of possible solutions to social situations. Rather, the difference between the two groups appeared in the proportion of aggressive responses versus appropriate responses generated. Aggressive children were found to have a significantly higher proportion of aggressive responses compared to appropriate responses than were the non-aggressive group (Deluty, 1981). Asarnow and Callan (1985) reported that 4th and 6th grade boys rated as aggressive by their peers, while generating fewer solutions to hypothetical problems than their non-aggressive peers, had a lower proportion of pro-social to total

number of solutions they successfully accessed. In addition, the behavioral responses the aggressive children accessed tended to be less mature and were more often rated as being reactively aggressive.

Dodge et al., (1986) found a similar occurrence when assessing differences in the problem solving strategies of aggressive and non-aggressive children. As was the case in the Deluty study, the two groups were comparable with regard to the amount of responses generated in response to a simulated provocation scenario, but the aggressive group had a higher proportion of aggressive responses. In addition, the amount of aggressive responses generated was strongly associated with aggressive behavior in observational periods during experimentally manipulated scenarios and actual classroom behavior. Finally, the two groups were found to generate a comparable number of competent responses to social dilemmas. This last finding differs slightly from those of Deluty, which suggested aggressive children might lack the capacity to generate a range of competent responses. Instead, the Dodge study suggests that the number of aggressive responses one accesses is the strongest predictor of aggressive behavior among the response access stage characteristics- at least among older grade school children.

The disparate findings between the Dodge and Deluty research and the Slaby and Guerra research have yet to be reconciled. In fact, Dodge himself has found evidence for both quantity and quality of responses in a later study (Dodge et al., 1990). This study demonstrated that in a group of five-year old children, deviations in both the quality and quantity of accessed responses predicted behavior problems 6 months later. Accessing aggressive responses predicted teacher-rated and peer-rated aggressive behavior (the quality factor), failure to access competent responses predicted later teacher-rated

aggressive behavior (the quality factor), and total number of responses (the quantity factor) predicted directly observed aggression of children at school. Groups differing in other types of status (e.g., popularity), do not appear to differ in their ability to generate solutions to situations, indicating differences in response access does not predict a more general social success variable (Feldman & Dodge, 1987). The role that quality, quantity, or both have in shaping aggressive behavioral responses among children and adolescents remains unclear at present.

One possible way to rectify these disparate findings lies in recent research studying adult psychopaths. Investigations have demonstrated that aggressive individuals suffer from executive functioning deficits that are not present in non-aggressive samples, affecting their ability to inhibit aggressive responses (Newman & Kosson, 1986). A study by Lau and Phil (1996) found males rated as aggressive were significantly worse at inhibiting aggressive responses- in spite of having the incentive of a monetary rewards to inhibit aggression- than were non-aggressive males. What some recent investigators contend is that executive functioning problems lead to an inability of the aggressive individual to effectively choose and use appropriate social responses, even when such responses are explicitly offered to them. The ability to filter impulsive, often aggressive behavioral responses from good ones is compromised (Hoaken, Shaughnessy, & Pihl, 2003).

Whatever the role may be of the responses themselves that are accessed, it does appear that the external demands of social situation are consistently found to be a non-factor in determining aggressive responses. Research has consistently found that problematic response accessing tendencies of aggressive children do not appear exclusive

to situations for which aggressive responding is pulled. When compared with non-aggressive peers, aggressive groups generate a greater number of aggressive responses to friendship or group entry scenarios (Rubin & Krasnor, 1986), provocation scenarios (Waas, 1988) and object acquisition dilemmas (Rubin, Bream, & Rose-Krasnor, 1991). They also tend to arrive at a higher frequency of socially incompetent, immature or bizarre behavioral responses across many different social contexts (Dodge, 1993), indicating more general socialization difficulties than a specific tendency to respond aggressively. Nonetheless, response-accessing problems within one situation do not necessarily predict the same problems in different social scenarios (Dodge et al., 1986). For instance, deficits in generating solutions during simulated peer provocation situations were predictive of actual aggressive behavior only in peer provocation scenarios and not during a group entry scenario. The same was true with respect to deficits during hypothetical group-entry scenarios; response-accessing problems predicted behavior problems in group entry situations but not in peer provocation situations. In other words, aggressive children's capacity to access competent, pro-social behaviors may be specific to certain situations, while in other situations, they may be quite capable of coming up with numerous appropriate responses (Dodge et al., 1986). This brings a layer of complexity to understanding the role of response accessing in trying to predict aggressive behavior. Children and adolescents seem to act aggressively in very unique, specific ways. What may cause one child to act aggressively in one situation may very well not be the same thing that causes another child to act aggressively.

Other research concerning the response accessing stage has suggested that it might not simply be the quality or quantity of solutions that is problematic for aggressive

samples, but rather the order in which the various responses are accessed in the child's mind. A study by Richard and Dodge (1982) found that children rated as aggressive by their peers came up with fewer solutions to various social situations than did children who were rated as popular. Although the two groups came up with initial effective solutions at the same rate, the aggressive group's subsequent solutions were more likely to be judged as ineffective than the peer-rated popular group. This finding held across both a peer provocation situation and a friendship initiation situation (Richard & Dodge, 1982). The authors concluded that aggressive children might be highly inflexible in their problem solving style. They seem to stick with one "competent" response rather than attempting to find more than one effective solution to a social situation. Instead, their decision making deteriorates into more aggressive, negative ways of responding. Absent the flexibility to generate a range of responses, they may be more likely to respond aggressively if alternative solutions are not tenable.

More recently, researchers have tried to link latent knowledge structures or internal working models of relationships to the generativity of aggressive responses in aggressive children (e.g., Dodge et al., 2002, Zelli et al., 1999). In each of these studies, internal working models defined as "hostile" have been positively correlated with the number of aggressive responses one can access. This is consistent with the finding that aggressive groups tend to arrive at aggressive behavioral responses most often in ambiguously defined situations- situations which one is believed to rely more heavily upon scripts or working models (Millich et al., 1984, Waldman, 1996). It appears that aggressive children are primed to access aggressive responses on the basis of hostile or exceedingly negativistic models of what to expect from interpersonal relationships.

The distinction between reactively aggressive and proactively aggressive children along these dimensions has not yet been investigated, but seem to be another way in which the two groups may differ. Reactively aggressive children may be more apt to access a limited number of responses that are likely to be toned with hostility. Proactively aggressive individuals may not suffer from limitations in their accessing capacity, but instead may be more prone to access aggressive responses that are in line with the antisocial goals they hold for social interactions.

Response Decision Stage

Independent of the content, number and order of behavioral decisions that are accessed, a separate processing stage involves deciding upon which of these behaviors is best suited to one's social goals. This process has been delineated from the response accessing stage by information processing researchers due to the importance the evaluative process itself appear to hold on aggressive behavior. As aggressive children and adolescents consistently decide to enact aggressive behavior more often than do their non-aggressive peers (Mize & Ladd, 1988, Slaby & Guerra, 1988), it has been hypothesized that the two groups hold different social values.

When compared with other children, aggressive youths have been shown to differ in how they evaluate distinct classes of aggressive, assertive or pro-social behavior (Crick & Dodge, 1994). Presenting children with hypothetical social scenarios, and asking them to place a value on various behavioral responses to these situations has been the typical research paradigm through which differences between groups are assessed. Typically, they are asked to evaluate responses along dimensions of morality or social favorability.

Deluty (1983) examined differences among groups of aggressive, assertive and submissive children in the evaluations they made regarding aggressive, assertive, and submissive solutions to ambiguous situations. Using Likert rating scales of certain adjectives, it was hypothesized that aggressive children would rate aggressive behavior in more favorable terms and would assess such behavior as more effective in achieving a goal. The former, but not the later, appeared to be the case. Children who were rated highly aggressive evaluated aggressive behavior as being more positive or appropriate, but did not seem to view such behavior as leading to what social goals they held. In addition, aggressive children viewed assertive responses as less favorable or appropriate and believed such solutions would be less effective than did the other two groups. Not only did aggressive children appear to evaluate aggressive responses in more positive terms, they rated “appropriate” social responses unwise and ineffective (Deluty, 1983). At least two other studies have found similar results: Aggressive children have been found to evaluate aggressive behavior more positively, while evaluating pro-social responses more negatively when compared with their non-aggressive peers, depressed peers (Quiggle et al., 1992), and popular peers (Asarnow & Callan, 1985).

Other findings have suggested that children who display aggressive behavior view their behavior as more benign than do other children. Relative to popular, average and socially neglected 3rd and 5th grade students, the rejected group (a group defined similarly to aggressive groups) were more likely to rate physically aggressive and threatening behavioral solutions as “friendly”, while rating compromising and polite strategies to negotiate conflict as “less friendly”.

Slaby & Guerra (1988) extended these findings to adolescent samples. Groups of incarcerated antisocial adolescents, highly aggressive high school students, and non-aggressive students were asked to describe their beliefs about the use of aggression in hypothetical provocation scenarios. The incarcerated group was more likely to endorse the belief that aggression is a legitimate use of behavior, that it improves one's self-esteem, and helps to avoid a negative image. In addition, the incarcerated group more often harbored the idea that victims of aggression do not suffer.

An issue separate from the manner in which individuals evaluate certain behaviors lies in how effective they believe they will be in enacting a certain behavior. Asking children to tell how effective they expect various behaviors to be in achieving desired outcomes typically assesses this. An emerging finding is that aggressive children anticipate pro-social or competent approaches as less effective in obtaining a desired outcome (Dodge et al., 1986, Crick & Dodge, 1989). Likewise, aggressive children are more likely to believe that positive outcomes will result from aggression (Crick & Dodge, 1989, Perry, Perry, & Rasmussen, 1986, Lochman et al., 1994). It appears, however, that it is highly dependent upon the goal an individual has for a social situation (e.g., Dodge et al., 1986) and in turn reflects only a minority of aggressive children. This minority tends to believe that aggressive behavior will lead to the attainment of tangible, instrumental rewards or will reduce aversive treatment from peers (Perry et al., 1986, Lochman & Dodge, 1994), but do not believe that such behavior will result in improved social relationships.

It appears then that the likelihood of one expecting a positive outcome for aggressive behavior is largely contingent upon the kinds of outcomes one values. This

suggests that the goal response stage may be a major determinant of how this response evaluation stage proceeds. It appears that aggressive children do not delude themselves into expecting that aggressive behavior lead to improved relationships or that it will not land them in the principal's office. Instead, aggressive subjects expect positive outcomes because the goals they value are distinct from the goals their peers value. Boldizar, Perry and Perry (1989) hypothesized that aggressive children act with aggression based upon their expectations and because they tend to value different outcomes than do non-aggressive children. In order to investigate this hypothesis, aggressive and non-aggressive children were asked about how pleased or bothered they would be if certain consequences occurred in response to their own aggressive behavior. Findings showed that aggressive children were more likely to value perceived control over a victim, were less worried about the prospect of causing suffering to the victim, and were less concerned about retaliation, peer rejection or the prospect of negative self-evaluations (Boldizar et al., 1989).

Crick and Ladd (1990) found similar variations among groups in the value each held for varying social outcomes. In their investigation, rejected children (a group routinely found to be closely related to aggressively rated children) were more focused on instrumental outcomes than were average and neglected children, and less likely to focus on relational outcomes than were the average children.

As noted in the section on the goal formulation stage, individuals rated as proactively aggressive entertain instrumental goals for social situations more often than children rated reactively aggressive (Crick & Dodge, 1996). Therefore, proactively aggressive children who value instrumental outcomes over relational ones are less likely

to recognize the loss of relationships or other poor relational outcomes as negative (see Hart, Ladd & Burleson, 1990). On the other hand, reactively aggressive children tend to value relationship-related outcomes over instrumental outcomes, precluding them from acting in an instrumentally aggressive manner. In hypothetical conflict situations, individuals rated as proactively aggressive are found to be more likely to report positive outcome expectations for enacting aggressive behavior and claim to be more effective using aggression in such situations than are their reactively aggressive peers (Crick & Dodge, 1996). On the other hand, reactively aggressive children tend to hold outcome values and expectations similar to those of non-aggressive groups.

While it appears that most children do not hold positive expectations of aggression, it seems that if an individual does hold such expectations, they are quite likely to respond aggressively. A number of studies have demonstrated that positive outcome expectancies of aggressive behavior are positively related to later displays of aggressive behavior (Dodge et al., 1986, 1995, Dodge, Laird, Lochman & Zelli, 2002). However, these expectancies are not as strong or durable predictors as processing deficits in previous information processing stages tend to be. Correlations between the positive endorsement of aggressive responses and aggressive behavior range from .21 to .31 when the behavioral assessment is made concurrently. However, they reduce to .11 to .16 (but still significant) when predicting behavior 6 months to a year later, and drop to .06 when predicting two years later (Dodge et al., 1986, 1995, 2002). The relationship is most likely mitigated by the fact that, again, only a subset of aggressive children expects positive outcomes following aggressive acts. Investigations have not yet looked into the relationship between exclusively proactively aggressive groups and future observation of

aggressive behavior. However, a recent study demonstrated that children who place high value upon instrumental outcomes tend to be rated highly aggressive by their teachers and parents (Dodge et al., 2002).

Beliefs about an individual's capacity to successfully enact behavior have been thought to be another determinant of how one evaluates behavioral responses. Two studies have searched for differences between aggressive and non-aggressive children in the evaluations of their ability to behave aggressively or to behave pro-socially (Perry, Perry & Rasmussen, 1986 and Erdley & Asher, 1996). Hypothesizing that self-efficacy perceptions and outcome expectations are causal influences of behavior, aggressive children have been hypothesized to be a group who would rate themselves more effective when acting aggressively but less effective to enact appropriate behaviors or to regulate their aggressive behavior. Results from both studies confirmed that aggressive children were more confident in their ability to aggress than were non-aggressive children, and the Perry study indicated that the aggressive groups believed themselves less effective in inhibiting aggressive responding. Lastly, the Erdley and Asher study found aggressive children rated themselves less effective in responding in competent, cooperative ways- a finding that was not supported by the Perry study.

Enactment Stage

Finally, the actual ability to behave competently is understood as another proximal determinant in the social information-processing model of childhood and adolescent aggression. Children vary not only in their capacity to adequately process social information and formulate outcomes, but also in the manner in which actual

behavior is displayed. It stands to reason that poorly enacted, pro-social behavior may lead one to execute alternative behaviors in their stead. In order to test this assertion, experiments have been designed to test children and adolescents in their ability to act out social behaviors scripted by an experimenter. Independent raters are then asked to measure the competency of the enacted social behaviors.

As it stands, only a few studies have compared aggressive children with non-aggressive children in their ability to competently enact certain social behaviors. Instead, rejected and popular children seem to be the sociometric groups most closely examined (e.g., Feldman & Dodge, 1987, Dodge et al., 1986).

While the studies have been few in number, there is some support for the contention that aggressive and non-aggressive children differ in their ability to competently execute social behavior (e.g., Jenson & Howard, 1990). One of the few studies that have examined the association between enactment skills of behavioral responses and aggression found that a significant relationship exists. Dodge et al., (1986) had groups of aggressive and non-aggressive children role-play certain social skills to hypothetical scenarios. Aggressive children were rated as less able to tactfully negotiate a situation in which they were unintentionally provoked by a peer, and were less successful in gaining entry into a peer group, even when they had the behaviors to execute scripted for them. Competency in skill enactment was predictive of success in a peer-entry task that was set up later by the experimenters, but did not significantly predict the presence or absence of later teacher and observer ratings of aggressive behavior. However, Mize and Ladd (1988) found that the competency in which preschool children prescribed behavioral responses predicted subsequent teacher ratings of observed

aggressiveness in these children. The limited amount of research done so far supports the contention that aggressive samples have greater difficulty enacting competent social behavior than non-aggressive peers.

Within-stage Deficits and Across-stage Deficits

As noted earlier in the paper, the information processing stages do not operate in isolation, but instead exert mutual influence and reciprocal effects upon each other.

While many studies have made direct links between stages and aggression after controlling for variations in the other stages, it appears that the sum of the collective stages is greater than its parts. That is, the relation between the individual stages and aggressive behavior tend to be significant but small, while the total correlation between all steps and aggression remains large (e.g., Dodge et al., 2002).

Investigation in this area indicates that the number of stages an individual displays processing problems results in incremental increases in the likelihood of aggressive behavior problems. Dodge et al., (1995) found that children who had deficits in three or four processing stages were more than four times as likely to have clinically significant conduct problems than those children who had no processing problems. Likewise, the mean number of overall processing-stage problems in the clinically deviant group was nearly double that of the normal group. In a separate study, Dodge et al., (1986) found 40 % of children rated as aggressive were found to have processing deficits in two or more stages and 16 % were found to have deficits in three or more stages. Meanwhile, only 21% of non-aggressive children had two processing deficits and none of these children were found to have three or more.

Extending this finding to adolescence, males with extreme types of violent behavior tend to demonstrate deficits in a number of information processing stages rather than just one. One study found that only after combining encoding deficits, hostile attributions and accessed responses together as variables, were violent groups distinguishable from normal groups (Lochman & Dodge, 1994). A later study confirmed these findings among a separate group of violent, aggressive and non-aggressive high-school students (Slaby & Guerra, 1988). Similar to the previous study, encoding deficits, hostile attributions and beliefs supporting aggressive behavior were the three strongest variables in effectively discriminating between aggressive and non-aggressive groups of adolescents, with deficits in each of these areas contributing unique and incremental predictive power to group membership. Together, these findings indicate that the proximal mechanisms of aggressive behavior might be better understood as being related to patterns of deviant information processing, rather than the result of any individual step having gone awry. Furthermore, these findings suggest a broad role that latent knowledge structures may play in determining aggressive behaviors. This proposition will be the next focus of this chapter.

Latent Knowledge Structures

Although a great deal of research has been done to explicate the proximal information processing tendencies that underlie aggressive behavior, only recently have efforts focused upon the investigation of latent mechanisms that may regulate deviant processing patterns. Recent social cognitive models have posited the role “latent knowledge structures” play in guiding information processing (Crick & Dodge, 1994).

Knowledge structures can be defined as “internal mental representations that have been derived from memories of past experiences and... (determine) how people represent, categorize, and interpret ongoing social events” (Burks, 1999). The label “knowledge structures” is used interchangeably in the social cognitive literature with terms such as schemas or scripts (Huesmann, 1988). Notably, the term bears a strong similarity, both in descriptive terms and their purported development from early childhood experience, to “internal working models” that attachment theorists describe (Bowlby, 1982) as well as modern psychoanalytic conceptualizations of object relations (Mitchell, 1988). Social cognitive theorists have made significant progress in describing how these psychic structures affect cognitive processes, and ultimately, social behavior.

Latent Knowledge Structures Role upon Information Processing

An individual is limited in the amount of social information he or she can attend to and encode, must make interpretations of this limited amount of information, and can only access and evaluate a finite number of responses to a given situation. Knowledge structures provide required assistance by “filling in the gaps” of information. Pre-existing ideas individuals have about themselves, other people and relationships serve to focus attention on relevant social information, to interpret this information, influence goals for social interactions, and affect the values and expectations people hold regarding their behavior. Thus, social cognitive theorists posit that many deficits in information-processing tendencies aggressive children display are the result of the variation in their latent knowledge structures (see Huesmann, 1998 for a more detailed discussion).

Graham, Hudley and Williams (1994) made an early attempt at investigating the relationship among knowledge structures, deviant information processing and aggressive behavior. They examined variations in “accessibility” of hostile latent knowledge structures between groups of aggressive and non-aggressive adolescents. The two groups were “primed” to make one of two-knowledge structures (relationships of hostility or neutrality) salient while the children were presented with an ambiguous hypothetical social scenario. The adolescents were then asked to give their interpretations of an actor’s intent in the scenario. The aggressive group was found to be consistent in their interpretations of the social scenario across the two priming conditions, attributing hostility regardless of whether they had been primed for a neutral or a hostile response. The non-aggressive group only interpreted hostile intent in the actor when they had been primed beforehand, but did not make similar attributions when there was no such priming preceding the scenario. The authors attributed the group differences to the chronic accessibility of hostile knowledge structures among aggressive adolescents across situations. Put another way, aggressive children seem to anticipate hostile interactions with or without external priming; they appear to enter situations already primed, through internal mechanisms.

According to Huesmann (1988), schemata individuals have acquired through social learning processes during early development regulate aggressive behavior. Huessman has defined schemata as an organized set of beliefs, attitudes and expectations. These are believed to serve as an individual’s cognitive manual to what is happening in the social world, how to respond to the social world and what the likely outcomes are to those responses. Normative beliefs about aggressive behavior are one component of the

schemata individuals use to process social information in situations that hold the potential for aggression. Huesmann and Guerra (1997) evaluated the normative beliefs a sample of children held about aggressive behavior. They discovered that general beliefs regarding the appropriateness of aggression, and situation-specific beliefs, including that aggression is appropriate when provoked, were positively correlated with peer and teacher ratings of the child's level of aggressiveness. The correlations, however, were not very high and ranged from just .11 to .22. Despite the overall weakness of the relationship, it appeared that strong beliefs about aggression early in life (in this case, age 6) are positively associated with aggressive behavior later in life (at age 8 or 9). Reciprocally, aggressive behavior early in life is associated with individuals who believe that aggressive behavior is appropriate later in life (Huesmann & Guerra, 1997).

Instead of examining the role normative beliefs about aggression have upon behavior directly, Zelli and colleagues investigated the relationship between beliefs and information-processing steps (Zelli et al., 1999). Specifically, they assessed the impact this aspect of latent knowledge structures had upon the interpretation, response accessing and response decision stages. They found the belief that aggression was appropriate in general, and in specific situations such as retaliating for an aggressive act, was positively associated with hostile attributions, accessing of aggressive responses and evaluating aggressive outcomes positively. Furthermore, they found that while normative beliefs about aggression were predictive of aggressive behavior later in life, the statistical relationship was mediated entirely by the role of the processing deficit variables (Zelli et al., 1999).

An investigation by Burks and colleagues assessed the latent knowledge structures of human relationships and their association with deviant information-processing and aggressive behavior. The investigators used a projective test (the Sentence Completion Task) to evaluate the presence of knowledge structures that were hostile in nature. As was the case in the Zelli study, hostile knowledge structures were associated with the presence of hostile attributions. Additionally, their presence was consistent with higher incidences of accessing and selecting of aggressive behavioral responses (Burks, Laird, Dodge, Pettit, & Bates, 1999), with correlations ranging from .11 (for hostile attributions) to .33 (with aggressive response accessing). The study also found that the association information processing had with externalizing behavior was contingent upon the valence of these knowledge structures. While the knowledge structures variable and the information-processing variables were positively associated with externalizing problems later in life, the significant relations between the latter variables were completely accounted for statistically by the knowledge structure variables. Finally, these variables, together, are able to account for the stability between externalizing problems at two separate periods in time, spaced a year apart (Burks et al., 1999).

One important finding that has emerged from this area of study is that latent knowledge structures have a number of emergent qualities to them, beyond the emotional valence. Dodge and colleagues have argued that several different aspects of latent knowledge structures contribute to an understanding of what causes effective and ineffective information processing to occur. Furthermore, they posit that attempts to

assess just one component are likely to miss out on a great percentage of the predictive variance that may be attributed to the knowledge structures.

One quality that was investigated was how appropriate an individual considers certain kinds of social interactions to be. Appropriateness of the knowledge structure is a component distinct from the valence of the structure. While an individual may have a readily accessible model for relationships that is “hostile”, it may not result in aggressive behavior if the individual understands such models as inappropriate, given the social situation. Such individuals may become vigilant to or avoidant of certain types of relationships or situations when these models are accessed. On the other hand, if one anticipates relationships as hostile or aggressive but finds such relationships appropriate, he or she should be less likely to avoid conflict and more prone to interactions marked by aggression. Burks and colleagues sought to determine the relative impact of the valence and appropriateness of the representational models individuals had at their disposal (Burks, Dodge, Price & Laird, 1999). The study demonstrated that socially inappropriate knowledge structures were the greatest predictor of concurrent aggressive behavior and was the only significant component associated with such behavior later in life (Burks et al., 1999). The emotional valence of the knowledge structure was a relatively weak predictor of whether an individual was rated by teachers as aggressive and did not provide any predictive value for later aggressive behavior.

Finally, Dodge and colleagues (2002) questioned whether aggressive children tend to have more bizarre or idiosyncratic latent knowledge structures of human relationships. More specifically, they assessed the children’s ability to be empathic to other children’s emotions and how they understood the motives of other children’s

behavior. Children who generally conceive of their own emotions and those of others around them in an inappropriate or bizarre manner were expected to display more attribution biases, problematic response accessing, deviant outcome expectations, valuing of instrumental outcomes and aggressive behavior in general. In line with predictions, greater emotional understanding was negatively related to all four information-processing deficits (Dodge et al., 2002). Additionally, greater child aggressive behavior was predicted by the inability to accurately perceive fear and sadness in other people. Importantly, the study demonstrated statistically that the emotional understanding variables exerted their influence upon aggressive behavior through the information-processing variables (i.e., the variance of the information processing variables was completely explained by variance in latent knowledge structures), supporting the contention that knowledge structures guide appropriate or deviant cognitive processes.

While still in its infancy, investigations into the role knowledge structures play have already paid important dividends. Knowledge structures have provided a mechanism to explain the development, maintenance and cross-situational consistencies of the deviant information processing patterns that underlie aggressive behavior. In the reviewed studies, children who behave aggressively are more likely to conceive relationships in a manner out of step with consensual reality. Not only do these internal models tend to form unrealistic and highly idiosyncratic conceptions of others, but the models are also imbued with themes of hostility, aggression and domination.

As noted earlier in this section, statistical models have so far confirmed that knowledge structures exert influence on aggressive behavior via the cognitive processes among the various information-processing stages. However, these confirmations have

been on the basis of correlational studies. Causal paths can thus not be assumed between the variables, nor can the possibility be ruled out that an external third variable may be the causal influence on the co-variation of these factors. Additionally, the mediational effects of these variables upon aggressive behavior tend to be lower than expected (Burks et al., 1999, Dodge et al., 2002). There are a number of reasons why this may be the case. First, there are likely to be any number of additional external factors at play that influence the display of aggressive behavior. Sociological, biological and emotional influences tend to be given short shrift in this information processing model. Second, knowledge structures are multifaceted but the studies thus far have typically measured one or two for investigation. Measuring a number of the qualities among children's knowledge structures are likely to result in a more thorough, but complex understanding of the relational models aggressive children and adolescents have at their disposal. Finally, distinct knowledge structures seem likely to underlie either reactive or proactive subtypes of aggressive behavior. Hypothetically, reactive aggressive children seem prone to have more hostile, emotionally charged representations of relationships while proactively aggressive individuals may have less appropriate or empathic models.

Conclusion and Future Directions

The social information-processing model clearly has demonstrated a number of robust findings in support of several of its contentions. Cognitive processes in each step in the information-processing sequence have been associated either with individuals identified as aggressive by their peers or with actual aggressive acts. While the individual stages are demonstrated to offer unique variance to the prediction of

aggression, it appears that patterns of deviant processing across stages have better explanatory power than analyzing them independently. More recently, theorists have incorporated the concept of latent knowledge structures into information processing models, in order to explain the development, durability and cross-situational consistency of deviant processing. This too has met with positive results and appears to be an important direction for further research.

There are, however, a number of limitations to the model. Perhaps the greatest critique upon any social cognitive model of behavior is the lack of attention paid to emotion. The information-processing model holds a “bias” in assigning the primary organizing role of behavior to cognition, while largely leaving out emotional factors. However, of the few studies that have investigated it, the relationship between emotions and information processing appears to be an important one (e.g., Dodge & Somberg, 1987). Integrating emotional factors into the model appears an important requisite for a more comprehensive explanatory thesis into aggressive responding. More specifically, the capacity to regulate affective states, emotions of a highly negative valence, whether they be temperamentally or environmentally determined, would seem likely to exert a great deal of influence upon how one encodes or retrieves social information (see Westen, 1991).

There remain a number of other factors that, at present, limit greater generalizability of the information-processing model. It remains unclear in what way age and gender variables effect processing in each of the stages. Most studies have examined groups of boys, partly owing to the difficulty in identifying a greater sample of females. While deficits in processing stages have been found in childhood and well into

adolescence, it remains to be seen in what way age mediates or exacerbates the role these deficits play. Do encoding deficits seem to worsen as children age? Does maladaptive interpretations of social events become less of a determinant in aggressive behavior in adolescence? Questions such as these remain unanswered.

Another factor that has yet to be investigated is the role other social participants have in contributing to or moderating against the display of aggressive behavior. Certain characteristics of the participants seem likely to exert an influence upon one's processing tendencies. These include physical (strong or weak, tall or short, black or white) and emotional (friend or foe, kind or mean) attributes as well as the synchrony of characteristics between individuals (e.g., an interaction between a dominant child and submissive child will likely be different than the interaction between two dominant children).

Another problem with the model lies in the methods of assessing information processing itself. With very few exceptions, assessments of participant information processing tendencies in studies are made by asking children to reflect back upon these tendencies. Their responses to these questions are influenced only by what they are consciously aware of, what they can remember or what they decide to reveal to the examiner. However, there is evidence within the social cognitive literature that information processing occurs at non-conscious levels, leaving these self-assessments presenting only part of the processing picture. This is likely to be particularly deleterious during assessments in the encoding stage, when individuals are asked to report what they remembered from an event after the fact. In the case of assessing knowledge structures through questionnaires, people may be motivated to report more positive self and other

evaluations when such presentations can be consciously manipulated (see Westen, 1991). In the case of encoding assessments, then, the evaluation seems to be what the individual remembers encoding rather than what was actually encoded. This may then be a measure of one's short-term recall rather than one's capacity to adequately and thoroughly perceive and scan during an interaction. Additionally, assessing knowledge structures more indirectly, via projective assessments, would decrease the chances that an individual presents him or herself in a more socially desirable light.

Researchers attempting to understand latent knowledge structures would undoubtedly benefit from the voluminous amount of work done by psychodynamic writers. The idea of latent knowledge structures, as mentioned earlier, bears great similarity to concepts such as internal working models and object relations; in fact, it is quite difficult to distinguish among them. This may owe to the divergent allegiances among psychodynamic and social cognitive orientations, who are viewed as being at odds with one another. Although attachment research often overlaps significantly with social cognitive work, the two literatures seem to exist largely in isolation of one another. As it stands, psychodynamic writers dating back to Ronald Fairbairn (e.g., Fairbairn, 1952) and D.W. Winnicott (e.g., Winnicott, 1965) to present writers such as Peter Fonagy (e.g., Fonagy, 2001), Beatrice Beebe and Frank Lachman (e.g., Beebe & Lachman, 2002) have discussed in detail the development, qualities and social cognitive sequale of internal representations. Such study may have a great impact upon the way in which social cognitive theorists come to study and research latent knowledge structures.

Integration of these theories and research bases would significantly help to clarify the various processes underlying aggressive behavior as well as providing a richer

conceptualization of the development and maintenance of childhood externalizing behavior disorders. Additionally, it would provide a common lexicon from which various ideological “camps” can come to understand each other when addressing another large area of research among aggressive adolescents and children: their treatment.

Thus far, the information processing changes that occur as a result of psychological treatment/interventions among behaviorally disordered children and adolescents have not been thoroughly investigated. The amount of research done in this area is surprisingly small given the large amount of data existing on the mechanisms of the information processing model itself. As will be reviewed in the following chapter, treatment of behaviorally disordered children and adolescents is a vast area of investigation. Investigating information processes and latent knowledge structures of these patients in treatment, therefore, seems to be a highly promising avenue of research. It therefore seems useful to understand and elaborate the potential changes in the processing and knowledge structures that occur in treatment. It would be beneficial to elaborate the mechanisms of change that occur in treatment in order to develop direct interventions among various deficits. This dissertation represents an attempt to understand the information processing and latent knowledge structure changes that occur in one method of psychological intervention, a residential treatment center for behaviorally disturbed adolescents. As a way of introducing the study, the proceeding chapter will briefly review the literature on psychological intervention and treatment of patients with externalizing behavior disorders through residential treatment.

CHAPTER 2

INTRODUCTION TO CURRENT STUDY

The Study of Adolescents with Externalizing Behavior Disorders

The treatment of adolescents with serious behavior problems has gained growing relevance within the field of psychology. Disruptive behavior problems are among the most frequent reason for clinical referrals to child and adolescent mental health facilities (Hill & Maughan, 2001) and the various direct and indirect costs in the form of incarcerations, legal costs and failed treatments upon society are considerably high (e.g., Robins, 1978). Recent figures estimate prevalence rates of the DSM-IV diagnosis of Oppositional Defiant Disorder range between 2 and 16 percent for the population of adolescents, and Conduct Disorder numbers lie somewhere between 6 to 16 percent in males and 2 to 9 percent for females (DSM-IV, 1994). Adding to the bleak epidemiological picture, indications are that aggressive and antisocial behavior among children and adolescents is on the rise (Farrington & Loeber, 1998, Achenbach & Howell, 1993).

One of the most troubling characteristics of disruptive behaviors among adolescents is the endurance and persistence of the pathology throughout their early development. Numerous studies have noted the high stability of various aggressive and antisocial behaviors across time (Caspi & Moffit, 1995, Haapasalo & Tremblay, 1994, Farrington, 1991, 1994, Loeber, 1982, 1991). The temporal stability of clinically diagnosed behavior disorders has also become evident. One study found that of among a

sample of clinic-referred adolescent boys diagnosed with a DSM-III-R Conduct Disorder, 51% met criteria for the disorder 4 years later (Lahey et al., 1995).

The hopeful adage that predicts adolescents with behavioral problems “will grow out of it” is not well substantiated by epidemiological research. In fact, studies suggest that problems in adolescence are often a harbinger of serious pathology to come in adulthood. Prospective and retrospective investigations have found a significantly high proportion of adolescents with behavior problems living with a variety of social, emotional and behavioral problems in adulthood. The connection between early conduct problems and later antisocial behavior is so intimately linked in past studies that it has become a required criterion for making a DSM-IV diagnosis of Antisocial Personality Disorder (DSM-IV, 1994). One often cited review demonstrated a correlation between early aggression and later aggression to be .63 (Olweus, 1979), a number that approximates the stability of intelligence over time (Loeber & Coie, 2001).

Aside from antisocial problems, adolescents with disruptive behavior disorders are at higher risk for a number of mental health problems that include major depressive episodes, panic disorder, obsessive-compulsive disorder and somatization disorders (Robins & Price, 1991). They have also been linked with a number of poor socialization outcomes including higher proportions of school dropouts (Kessler, Foster, Saunders, & Stang, 1995), teenage parenthood (Kessler, 1997), marital instability (Kessler, 1998), poor health outcomes (Bardone, Moffitt, Caspi, Dickson, Stanton, & Silva, 1998) and violent death (Pajer, 1998). It should come as no surprise that the treatment of adolescents has become an increasingly relevant area for psychologists to investigate.

The Treatment of Behaviorally Disordered Adolescents

Reviews that have investigated the effectiveness of treating adolescents with behavioral problems do not offer much in the way of encouragement. The majority of treatments that have been applied to adolescents with serious behavioral problems have thus far gone unstudied (Kazdin, 2000). Those that have examined treatment efficacy have met with equivocal results, and there is no treatment that has been shown to effectively treat the more serious and stable of these disorders, such as Conduct Disorder, and their long-term course (Kazdin, 2000). While successful, promising treatments have been documented (see Kazdin & Weisz, 1998), many studies have noted that these successes do not seem to translate into successful adjustment after treatment has ended.

The failure to demonstrate either short-term or long-term efficacy at residential treatment centers is similarly problematic. These facilities are typically charged with the task of treating the most resistant and intractable of behaviorally disruptive adolescents (Wells, 1991), doing so at a considerable financial cost (Burns, Hoagwood, & Maultsby, 1997). Many studies have demonstrated changes in therapist ratings over the course of treatment (Whitaker & Pecora, 1984) or in drops of relevant post-discharge behavior (Chamberlain, 1997). However, the majority of studies reviewed in preparation for this chapter were found to have high percentages of individuals treated showing limited or no change at discharge or follow-up, and of those that did show these, the outcome seemed to be of dubious clinical significance. For instance, a recent residential treatment study claimed success by displaying a mean difference in post-discharge arrests among the treatment group (mean = 2.6) compared to the comparison group (mean = 5.4) (Chamberlain, 1999). A statistically significant finding for certain, but the clinical

significance of the disparity between groups seems questionable. The stability of treatment gains following the intervention has also been brought into question. A thorough review of residential treatment outcome studies done by Curry suggested that positive discharge status was not predictive of post-discharge adjustment (Curry, 1991). Investigators have been left only with speculations as to the reasons treatment seems to have been of limited success in procuring durable changes among clinical samples (e.g., Kazdin, 2000). One area of concern is the methodology of outcome studies themselves.

Limitations of Previous Outcome Studies

Reviewers of behaviorally disturbed adolescents note that important methodological issues have limited the knowledge of various treatments within this population (Kazdin, 2000, Frick & Loney, 1999). Among the methodological problems is the issue of assessing outcome itself. In an article reviewing 34 studies of residential treatment and hospitalizations of children and adolescents, the authors called for methodological improvements in the manner in which outcome studies were conducted (Pfeiffer & Strzelecki, 1990). Out of the four main areas for improvement, two of the areas of improvement related to the range of outcome variables that are typically assessed. Citing previous shortcomings, the authors suggested using multiple measures from varying perspectives to assess differences in clients' functioning and noted that studies should assess both micro-level (specific, observable behaviors) and macro-level (broad traits) indicators of outcome. Several other authors have agreed with this contention and called for a broader scope of measures to assess outcome domains (Wells, 1991, Curry, 1991, Fergusson & Horwood, 1993, Kazdin, 2000).

Currently, most studies are restricted to a single measurement method of limited scope. A recent survey of residential treatment centers undertaking outcome studies noted the majority were utilizing a single behavioral rating scale or a self-report measure to assess change (Nansel, Raines, Jackson, Teal, Force, Klingsporn, & Burdsal, 1997). There are many reasons to choose ratings or self-report measures. First, they tie closely to the behavioral nosology of the DSM-IV. As most referrals to residential treatment centers are made on the basis of specific disorders, symptomatic functioning as it pertains to the DSM-IV is the logical target for assessing change. In addition, behavioral ratings such as the Child Behavior Checklist offer sound factor-analytic support for their scales and criterion-related validity data for these instruments are typically high (Achenbach, 1991). Finally, many studies are faced with financial and institutional constraints; ratings and self-report measures are relatively inexpensive, in terms of time and money required to administer and score (Quay, 1986).

What remains in the wake of these outcome studies is a greatly limited amount of knowledge about the changes that adolescents undergo while in treatment. Among these are cognitive and emotional processes delineated in the previous chapters, as well as the internal representations or latent knowledge structures that are believed to underlie these processes. As demonstrated in Chapter 1, the experimental and clinical research literature is replete with empirical evidence suggesting that these processes and knowledge structures underlie and maintain disruptive behavior in adolescents.

The study and assessment of these constructs require tools that typically lie outside the scope of measurements used in the majority of the outcome studies at adolescent, residential treatment facilities. Prevalent measures in clinical research

include the Rorschach Inkblot Method and the Thematic Apperception Test (TAT); (Westin, 1991, Weiner & Exner, 1991). While the assessment of this domain has spread in the area of outcome studies for outpatients, it appears that save for a few studies (e.g., Abraham, Lepisto, Lewis, Schulz & Finkelberg, 1994, Blatt & Ford, 1994), these measures have been neglected in inpatient settings. As it stands, there remain questions regarding the ability of residential treatment centers to address changes in cognitive and emotional processes and internal representations, psychological structures believed to be highly relevant to the disorders these adolescents display.

The evaluation of these constructs offers the potential of a variety of methodological and practical advantages to an outcome assessment. First, it could broaden the scope of the existing knowledge regarding changes adolescents make at residential treatment centers. In doing so, it may provide improved predictability regarding the generalization of treatment gains from the facility into the post-discharge environment (Wells, 1991). It may also be able to provide important prognostic indications of the psychological structures associated with success at a residential treatment facility (Blatt & Ford, 1994).

These measures have additional benefits. Beyond the wider scope and added predictive utility these measures may offer, they also act as safeguards against potential measurement biases that may occur when using self-report or behavioral observations (e.g., Blatt et al., 1994). There are many reasons for the adolescents and staff to present the participants as treatment successes when approaching discharge (see Frick, 1998), such as the desire to look good or to promote a sense within themselves as being ready for discharge. Manifestations of internal representations, and emotional and cognitive

processes cannot be as easily faked. In fact, the participant in perceptual-cognitive or projective tasks typically is not conscious of what it is that is being assessed. Tests like the Rorschach and TAT can often circumvent positive impression management tactics or biases by indirectly measuring constructs of an individual's personality functioning.

Finally, using the Rorschach in conjunction with behavioral and self-report measures is in line with the growing emphasis placed upon multi-method, multi-dimensional assessments of treatment outcome (Ogles, Lambert, & Masters, 1997, Strupp & Hadley, 1977). Using these three measures together offers a broader perspective for assessing outcome that is in line with Strupp and Handley's tripartite model. The Rorschach offers a glimpse at intrapsychic change, the CBCL of the change felt by the individual's social milieu, and the MMPI-A relates the changes the individual reports having been made.

Purposes of Study

The first aim of this study is to broaden the range of outcome assessment in adolescent patients staying at a residential treatment center. As discussed earlier, the effects of psychological interventions upon information processing and latent knowledge structure variables has been the focus of only a limited amount of research. This study will describe the information processing and latent knowledge structure characteristics of a group of behaviorally disordered adolescents. At the same time, self-report and behavioral measures traditionally used in residential treatment outcome studies to assess behavioral and symptomatic change will be employed. These measures offer clear and

direct ties to many of the behaviors and symptoms associated with disruptive behavior disorders.

To assess the various information processing and latent knowledge structure variables, determinants and composite scores from the Rorschach Inkblot Method will be used. The use of the Rorschach in such a way represents a significant departure from the measures used in the studies reviewed in Chapter 1. Nonetheless, the Rorschach has demonstrated its considerable utility in assessing latent knowledge structures, or in social cognitive parlance, internal representations (e.g., Viglione, 1999, Viglione & Hilsenroth, 2001). While often dismissed as a projective measure by those unfamiliar, the Rorschach has enjoyed widespread use as a cognitive task assessing many of the information processes delineated by social cognitive psychologists (see Exner, 2002; Klieger, 1999).

A second issue this study will address is if changes in the quality of internal representations and emotional and cognitive processes across time are related to behavioral changes assessed through the behavioral rating scales. This will allow for an understanding of how information processing variables relate to observable behavior changes. This will be an important first step in determining the role changes in information processing variables play in actual behavior change.

This study does not represent an attempt to justify a certain modality or conceptual framework regarding the treatment of adolescents. In fact, the residential treatment center in this study uses various modalities of treatment, including family therapy, behavior modification as well as contemporary psychodynamic approaches.

CHAPTER 3

METHODS

Treatment Setting

Participants in this study were drawn from newly admitted individuals referred to a residential treatment facility for adolescents in East Tennessee. The facility is located on a secluded campus in the woodlands of the Smoky Mountains. The facility accepts males and females, ages 13 to 18, who are experiencing psychopathology of severe affective symptoms, disordered conduct, substance abuse or chemical dependency, attention deficit, hyperactivity and/or brief psychotic episodes. Most patients at this facility are referred due to the “out of control” nature of their conduct and receive either the DSM-IV diagnosis of Oppositional Defiant Disorder or Conduct Disorder.

Acceptance to the facility is contingent upon the adolescent having the capacity to make use of a milieu type experience. On this basis, there are many personality characteristics that preclude individuals from admission to the facility. Intelligence is required to be at least in the Low Average range. Individuals with an extensive history of fire setting or pyromania, or who are experiencing homicidal intent at the time of admission are not admitted to the facility. Participants are free of physical or medical conditions that would hinder participation in vigorous, outdoor activities. Evidence of entrenched psychopathy also precludes acceptance into the facility. Participants typically had one or more previous inpatient treatments and many have also experienced less restrictive interventions such as outpatient therapy, day treatment programs, and/or boarding schools.

Based upon a thorough psychological evaluation and assessment of family dynamics, treatment is tailored to each individual based upon their current needs. The treatment facility provides each patient with multiple interventions, including individual psychotherapy, group psychotherapy, family therapy, activity therapy, education and vocational training. The treatment is considered comprehensive and broad in scope but highly individualized and flexible for each participant.

Intervention

The rationale and formulation for treatment at this facility is psychodynamic in nature, and has been based upon a model initially elaborated by the work of Donald Rinsley at the Children's Section of the State Hospital (see Reithmiller, 2002 for a detailed description and rationale of Rinsley's work). This model was then adapted to the current treatment facility by Vance Sherwood, the founder of this study's facility (Larry Brown, personal communication, 2001). Treatment is designed to alter many fundamental aspects underlying externalizing behavior disorders:

The essential goal of the...program is to alter the values and personality of these adolescents so as to impart respect for authority, a sense of self as part of a group or larger community, self-restraint, tolerance for tension and frustration, (and) independence in relation to others. (*Peninsula Village*, 2003, pg.2).

The targets for change are toward improved social relationships and a diminishment of aggressive, antisocial behavior.

The course of treatment is divided into three main phases. Upon admission, patients spend the beginning of their stay in a Special Treatment Unit (STU). This initial phase typically lasts between two weeks and two months, depending upon the staff's assessment of the patient's progress. This period is intended to indoctrinate the patient

into the culture at the facility, establish an alliance with the patient toward treatment goals, and to ready the individual for treatment within the second phase. The STU environment reduces the amount of external stimulation for the patient, and limits the patient's social life to school, group psychotherapy and elemental activities of daily living such as eating, bathing and sleeping. Otherwise, the majority of the individual's time is relegated to quiet solitude. The patient's readiness for the next phase is made on the basis of the patient's ability to align themselves to the staff's treatment goals, as well as the patient's psychological capacity to make use of treatment. Regarding this latter point, patients will often be discharged if the individual is psychopathic or psychotic; such patients are not believed to be suitable.

In the second phase of treatment, the patient becomes involved in a wider range of social and therapeutic activities to directly address treatment goals. Upon leaving STU, the patient is assigned a counselor, family therapist, individual therapist as well as a psychologist who coordinates the entirety of the treatment. The patient lives in a cabin with same-sex peers and at least two counselors. He or she attends school, group psychotherapy, individual psychotherapy, psychiatric appointments, as well as engaging in work and milieu activities. Each week, the patient's progress is reviewed by his or her treatment team, at which time goals are assessed, changed or adapted. This stage culminates anywhere from 2 months to 2 years depending upon the severity of the patient's pathology, but economical constraints (e.g., lack of insurance reimbursement) can also lead to premature cessation of this stage.

The final stage of treatment is designed to help the patient terminate his or her treatment at the facility and to facilitate their return to a less restrictive environment.

Family meetings, placement referrals and visits comprise the pragmatic work involved with this stage, while psychosocially, the patient works toward preparation for the emotional requirements of leaving the facility and returning to their home or new placement.

Participants

Participants were drawn from a pool of all patients admitted to the treatment facility between July 1999 and April 2000. Informed consent was required from the participants and their parents to be deemed eligible for the study. The nature of the study and possible side effects were discussed with parents during the first family therapy session or the parents were told over the phone. Parents were asked during the family therapy session or over the telephone to sign and return a copy of the consent form within a month of the request in order for the initial admission assessment to be done as close to admission as possible. If the parents did not sign and return the form within 30 days (or refused to participate) the child was not eligible for participation. Thirteen parents did not return consent forms within the requested month time frame, 5 parents refused to allow their children to participate and one patient refused to participate.

In order to gain a sample consisting of individuals receiving long-term treatment, patients who were believed by staff to not stay longer than two months were excluded from the study. Reasons for a shorter stay were typically due to restrictions of the individual's insurance coverage. During the recruitment period for this study, 23 subjects were excluded due to this criterion. If a participant of the study left treatment early, their admission data were collected, but they were not part of any analyses for this study. A

total of eight adolescents left prematurely from treatment, four due to insurance complications that arose after their admission. The other patients were discharged because they were found to have problems unsuitable for treatment at the facility. Individuals who were discharged primarily suffered from either entrenched psychopathy or an organized psychotic disorder.

Admission data were obtained from a total of 61 participants. Thirty-four participants were male, and all but one of the sample was Caucasian (the other participant was Asian American). The mean age at admission was 15 ($M = 15.35$, $S.D. = 1.52$); the youngest participant was 12, the oldest was 18 years old. An informal review of the socioeconomic status of the patient's family indicated a fairly even spread among lower, middle and upper socioeconomic standing. Approximately a third of the participants' parents were either unemployed or making under \$20,000 a year, while roughly a fourth of the participants' parents held professional jobs requiring advanced education or training. Six of the participants were in state's custody at the time of admission, and 10 other subjects had been living with adoptive families.

Discharge data were collected from participants if they stayed at the treatment facility for an excess of 60 days. As mentioned earlier, 8 patients left the facility prematurely (prior to 2 months) and were not included in the study. Of the remaining 61 participants from whom admission data were collected, 5 did not have discharge data collected. One of the 5 participants eloped from the treatment facility, and four patients were discharged quickly due to pressure from insurance companies or an external placement demand. In these cases, the participant's discharge came too suddenly for the data collectors to administer the tests prior to their discharge. These individuals were not

included in the data set for this study. Of the remaining volunteers who ultimately constituted this study's sample, the mean length of stay was 250 days ($M = 250.21$, $SD = 123.67$) with a range of 67 to 501 days.

The participants' medical charts at the facility were reviewed to determine the DSM-IV diagnoses of each individual. The charts were reviewed by an advanced graduate student and a post-doctoral fellow in clinical psychology, both of whom had taken basic and advanced courses in psychopathology and assessment. Forty-nine of the 61 participants in the study were deemed by the reviewers to meet the DSM-IV criteria for Conduct Disorder. The remaining 12 participants who did not meet criteria for Conduct Disorder all met criteria for other DSM-IV diagnoses. Five participants met DSM-IV criteria for Oppositional Defiant Disorder, 3 met criteria for a diagnosis of Substance Abuse and/or Dependence, while the remaining 2 met criteria for a primary diagnosis of a DSM-IV affective or anxiety disorder. Finally, instances of each participant's history of substance abuse, physical and/or sexual abuse, self-mutilation, and physical violence were reviewed in the chart. Forty-two participants had a documented history of substance abuse, 26 had committed a violent act toward another person, 21 had a history of self-mutilation, 11 had been sexually abused, and 6 had been physically abused.

Measures

Child Behavior Checklist

The Child Behavior Checklist (CBCL; Achenbach, 1991) is one of the most widely used measures of child psychopathology. Raters are given three options to report

the frequency of 113 behaviors, “Not True”, “Somewhat True”, and “Very True/Often True” that form the basis of 8 factor-analytically derived clinical scales. For the purposes of this study, only the ratings contained on the third and fourth pages were requested from raters because the first two pages do not contain any items included in the CBCL scales used in this study.

The CBCL has enjoyed widespread popularity in both clinical and research settings and has an impressive test construction history. Among the advantages are the extensive norming done on the measure, strong internal consistency coefficients for the scales (median = .76) and composites (median = .92) that have high one-week test-retest coefficients (ranging from .75 to .95). Two-year test-retest coefficients for some of the more stable scales reach .87, and the scales have been found to reliably differentiate clinical from non-clinical samples (Achenbach, 1991b). It has been observed that the CBCL “is perhaps the best rating scale currently available for assessing severe symptoms of childhood psychopathology” (Merrell, 1991).

The CBCL was chosen based upon its ability to objectively assess the presence or absence of observable behaviors the participants are displaying throughout his or her treatment. This study used staff members at the facility instead of the participants’ parents to fill out the forms. A recent study examining the use of care workers in residential centers to rate child behaviors found the factor structure of the ratings were identical to that of parents (Albrecht, Veerman, Damen, & Kroes, 2001). Listed below are the various scales and the constructs which they will assess:

Incompetent Social Behavior

Social Problems Scale (SOC)- This scale assesses behaviors relating to the individual's capacity to engage in appropriate peer relationships.

Covert Aggressive Behavior

Delinquent Behavior Scale (DEL)- This scale assesses so-called "covertly aggressive" conduct problems displayed by the adolescent, such as lying, stealing, or cheating. This is one dimension or subtype of conduct problems thought to be distinct in many cases from those exhibiting aggressive behaviors.

Overt Aggressive Behavior

Aggressive Behavior Scale (AGG)- This scales assesses individual behaviors that are confrontational and aggressive in nature. These behaviors are overtly aggressive, and are thought to assess a different dimension of aggressive behavior than Delinquent Behavior Scale.

Minnesota Multiphasic Personality Inventory –Adolescent

The Minnesota Multiphasic Personality Inventory- Adolescent (MMPI-A) is a 458 item, self-report, paper and pencil questionnaire that represents a revised version of the original MMPI. To make the test more amenable to adolescents, the number of items was reduced, certain item content was altered, adolescent norms for the scales were collected and content scales unique to adolescent dilemmas were developed.

The MMPI-A is designed to assess psychopathology for adolescents, ages fourteen through 18, but can be used with 12 or 13 year-olds with adequate social and cognitive maturity (Archer, 1997). The MMPI-As ten clinical scales were developed

through empirical criterion keying while the 15 content scales were founded on more modern methods of test construction. As such, the internal consistency and test-retest coefficients are higher on the content scales than most of the clinical scales. In general, the clinical scales are thought to be a great deal more heterogeneous than the content scales and provide less in the way of evidence for external, criterion-related validity.

The MMPI-A was chosen for this study to assess changes in self-reported attitudes, behaviors and symptoms consistent with disruptive behavior disorders. The scales were chosen based upon their relevance to information processing constructs. As a self-report instrument, the MMPI-A is used in this study as the outcome assessment from the perspective of the patient. The MMPI-A represents the most popular of clinical assessments for adolescents (Archer, 1997) and is commonly used in residential treatment centers. Listed below are the scales that were used along with the relevant construct it assessed:

Knowledge Structures/Internalized Representations of Relationships

Cynicism Scale (CYN)- Associated with mistrustful, suspicious and cynical attitude toward others. Expectations of others as being interpersonally exploitative and typically hostile and unfriendly in relationships.

Alienation Scale (ALN)- Assesses an individual's belief or perception of other's as not understanding, unsympathetic or harsh.

Response Accessing- Aggressive Responses

Adolescent Anger Scale (ANG)- Measures the externalization of anger and potential for physical assaultiveness (Archer, 1997).

Response Decision- The Value of Aggressive Outcomes

Conduct Problems Scale (CON)- Measures the likelihood of being in trouble due to behavior problems, and the existence of antisocial behaviors, and attitudes and beliefs that conflict with societal norms and standards.

Rorschach Inkblot Test

The Rorschach Inkblot Test is a series of 10 standardized cards with inkblots upon each one. Although it has suffered from various criticisms regarding the instrument's validity and reliability, the latest scoring system has acquired newfound psychometric respect (Weiner, 1995). This is in large part due to the growing use of the Exner Comprehensive System that has dictated a more stringent standardized administration and scoring of responses. As such, most of the composite scores enjoy sound test-retest reliability coefficients and a growing number of empirical studies are validating individual scores and indices (Weiner, 1997, Viglione & Hilsenroth, 2001).

The Rorschach was chosen for this study in order to assess several relevant information processing variables. The use of the Rorschach in assessing disruptive behavior in adolescents has a long history that dates back as early as the work done by Robert Lindner (1944). More recently, Gacono & Meloy (1994) have provided a thorough and exhaustive study of modern Rorschach variables among adolescents with diagnoses of conduct disorder, some of which included information processing variables. The Rorschach has also been useful in assessing information processing changes in adolescents at residential treatment centers (Abraham et al., 1994)

There are two categories of Rorschach variables that were chosen to evaluate information processing tendencies of this sample. The first category is composed of Exner Comprehensive System variables that serve to directly measure perceptual-cognitive capacities of an individual. These variables relate to early information processing stages that research has shown to be significantly impaired in samples of adolescents with externalizing behavior disorders. The variables and relevant construct the variables addressed are listed below.

Encoding Deficits

Processing Efficiency Score (ZD) – The ZD score is a weighted score based upon the amount of perceptual information encoded by the individual across his or her Rorschach protocol responses. Lower scores (< -3.0) are indicative of responses that have encoded a paucity of perceptual information. High scores (> 3.0) reflect a protocol in which the respondent takes in more information than is typical, and is associated with people who examine their experience more thoroughly (Weiner, 1998). Scores in the -3.0 to 3.0 range indicate that the respondent, on average, has used a typical amount of information to generate a response. The inability to encode adequate amounts of perceptual stimuli in social situations has been associated with aggressive behavior problems in adolescents (Dodge et al., 1995).

Developmental Quality Complex Percentage (DQC)– This is a score based upon the amount of cognitive organization the individual displayed in formulating a response to the percept. The score is tallied by weighting each response based upon the level of cognitive complexity and amount of perceptual area involved in the formulation of the response. The responses are weighted from low-to-high,

the lowest weight assigned to vague and diffuse impressions of the blot (e.g., “it’s a cloud” or “smoke”). The next highest score is assigned to ordinary responses that have greater form demand but do not require a significant amount of cognitive complexity to formulate (e.g., “a bat” or “a mountain”). A higher weight is assigned to details of the blot that are synthesized in the participant’s response (e.g., “two bears clapping hands”). Finally, the highest weight is given to responses that synthesize aspects of the entire blot in the response, which may or may not include the white space (e.g., “fireworks at the Eiffel Tower”). These last two weights represent increasingly sophisticated formulations of ambiguous information. This measure assesses an individual’s encoding capacities in a manner distinct from the ZD score. Instead of assessing the amount of information encoded, the DQC score assesses the articulation, complexity and flexibility the respondent is cognitively performing to formulate an inkblot response. While deficits in the complexity and sophistication of the encoding effort can be assumed given the preponderance of attention and concentration problems among these samples, the characteristics have yet to be assessed in adolescents with aggressive behavior problems.

Interpretation Deficits

Distorted Form Score (X-%) - This is a measure of the percentage of interpretations of the inkblot stimuli that severely depart from the form demands of the contour. The quality of interpretation an individual makes has been linked to how one responds to an event (Dodge, 1980) and errors are thought to increase the likelihood of aggressive responding (Petit, Polaha, & Mize, 2000).

Response Accessing Deficits (Rigid, Inflexible Responding)

Form Percentage Score (F%)- This is a score reflecting the number of responses to the inkblot using Form as the sole determinant divided by the total number of responses. It is conceptually and mathematically similar to the Lambda variable, but is more suitable than Lambda for parametric analyses due to its relatively normal distribution (Meyer, Viglione, & Exner, 2001). It assesses the individual respondent's tendency to simplify complex stimulus fields in the face of ambiguity. Higher F% scores are indicative of individuals who interpret situations in a rigid, concrete, uncompromising manner in which the barest of motivation or reflection is performed and subtleties are not recognized (Weiner, 1998). Protocols with high F% scores have been linked, in adults and adolescents, to histories of antisocial behavior (Exner, 1993, Gacono & Meloy, 1994).

The second group of Rorschach variables assesses constructs that tap into later information processing stages. These variables measure the amount of aggression, hostility and malevolence the individual perceives or projects into their processing. These variables can also be distinguished from the MMPI-A scales, in that they are indirect measures of the quality of information processing stages which rely upon an "expert" or clinical perspective.

Interpretation Deficits/Hostile Attribution Bias

Aggressive Conduct (AGC) – This is a score that is coded in the presence of aggressive, angry or hostile percepts identified by the respondent. Given the neutrality of the inkblot, it is believed to represent the tendency to imbue ambiguous stimuli with hostility (Baity & Hilsenroth, 1999). The AGC score has

been correlated with behavioral measures of aggression in a large clinical sample (Baity & Hilsenroth, 2002) and has been able to successfully predict behavioral criteria associated with the DSM-IV criteria for Antisocial Personality Disorder (Baity & Hilsenroth, 1999). It has also been found to be significantly related to the MMPI-2 Antisocial Practices Scale and Anger Scale (Baity & Hilsenroth, 1999).

Response Accessing Deficits/Inhibition of Aggressive Responding

Holt Scale of Primary Process-Aggression (Holt-A1)- This scale a content score that is coded for responses that involve primary process thinking with a quality of “intense, overwhelming, murderous, or palpably sadomasochistic aggression”. A response coded as an aggressive, primary process response is thought to represent disinhibited, unmodulated responding, indicative of poor executive functioning (Holt, 1977). High scores on the scale have been related to severe disinhibition problems and affect modulation difficulties within clinical samples (Hilsenroth, Hibbard, Nash, & Handler, 1993; Fowler, Hilsenroth & Nolan, 1998). Problems in the inhibition of unmodulated, aggressive responses under experimental conditions have been linked in the information-processing literature with impulsive, antisocial behavior (Hoaken et al., 2003). Importantly, prior research has demonstrated that the Holt-A1 Scores and AGC Scores are not significantly correlated and seem to be measuring separate psychological processes (Baity & Hilsenroth, 1999).

Knowledge Structures/Internal Representations Deficits

The Mutuality of Autonomy Scale (MOA) – This scale is an ordinal measure rating Rorschach responses which depict interactions between two or more objects. Ratings are made from one to seven based upon the mode of interaction in the response. “One” scores represent mutual, benign and autonomous relationships between objects, while “seven” responses are coded for overpowering, dominant, enveloping relationships, or extreme destructiveness. The MOA scale has been found to be a reliable and valid measure of psychopathological object relations (Blatt, Tuber, & Auerbach, 1990), and is used in this study to evaluate the presence of, and changes among, latent knowledge structures about relationships. As has been done in prior research using the MOA, the overall mean MOA score, the mean for the highest MOA score and the mean for the lowest MOA score will all be included in the analyses.

Hypotheses

Admission Sample

Taking into account the literature on externalizing adolescents mentioned in the first two chapters, several hypotheses were formulated about the admission sample:

1a) Compared to normal adolescents, the admission sample was expected to suffer from significant deficits in their information processing capacities. In order to test these hypotheses, the admission sample was compared with, when available, age-matched non-patient samples upon the following Rorschach perceptual-cognitive (P-C) variables: X-%,

F%, and ZD. Because there are no normative data available for the DQC variable, a main component of the DQ variable, DQV, was compared to the normative sample.

2a) It was also expected that the admission sample would have significantly more pathology in the quality of latent knowledge structures than non-patients. To assess this, the sample was compared to a sample of non-patient children on the following scores: Highest MOA Score (MOA-H), Lowest MOA Score (MOA-L) and Mean MOA Score (MOA-M). These scores were expected to be significantly higher, in a pathological direction, among the admission sample when compared to the normative sample. The only available normative sample was with a group of children with a mean age of 10. While the age discrepancy makes such a comparison less than ideal, some authors question the effect aging has upon MOA scores (Blatt, Auerbach, Tuber, 1990). Nonetheless, the analyses were considered for exploratory purposes only.

3a) The admission sample is also predicted to vary significantly from a normative sample among the two other methods of measurement, the self-report MMPI-A and the behavioral rating CBCL. Based upon previous literature, the admission sample is believed to have more negativistic, suspicious and cynical ideas about relationships than non-patient adolescents. Likewise, they are expected to have more hostile, antisocial, and aggressive attitudes than non-patients. The following MMPI-A scales were expected to be significantly higher in the patient group, compared with the non-patient, normative sample: ALN, ANG, CON, and CYN. Additionally, the admission sample was anticipated to demonstrate high levels of aggressive and delinquent behavior, as well as difficulty socializing with their peers. The following three CBCL scales were expected to be significantly higher than non-patient peers: AGG, DEL, and SOC.

4a) Finally, the admission sample was expected to be similar to samples using adolescents with externalizing behavior disorders. The Rorschach P-C variables, MOA variables and the Aggressive Content score (AGC) were compared to a sample of age-matched adolescents with externalizing disorders existing in the literature. It was anticipated that no significant differences would emerge between groups. The purpose of this analysis is to test whether the P-C, MOA and AGC deficits found in the Gacono and Meloy study are replicable in the current sample. Similarities between this sample and the previous sample would strengthen the contention that a reliable pattern of information processing deficits exists among individuals with externalizing behavior disorders. Differences between the two samples would indicate that information processing deficits were a random artifact of the particular sample investigated.

Outcome Assessment

It is expected that as a function of the psychological treatment, the adolescent sample would change in significant ways at discharge. To assess changes made among the sample, CBCL, MMPI-A and Rorschach variables at admission and discharge were compared.

1b) It was anticipated that the sample would exhibit less delinquent and aggressive behavior at discharge, and would demonstrate better social/interpersonal skills. These changes were assessed by the CBCL variables, AGG, DEL, and SOC.

2b) The sample was also expected to change in their reported attitudes about relationships and how they describe their social behavior. These changes were assessed by the MMPI-A variables, ALN, ANG, CON, and CYN.

Prior literature has suggested that several information processing variables underlie aggressive and externalizing behavior problems. Since it was anticipated that the behavior of the participants would change as a function of treatment, the sample was hypothesized to change on the Rorschach variables that assess information processing tendencies.

3b) The Rorschach variables, AGC, Holt-A1, DQC, F%, X-%, ZD were expected to be less pathological at discharge compared to admission. Thus, the sample was expected to have less pathological latent knowledge structures. It was anticipated that the MOA-H, MOA-L and MOA-M would decrease (i.e., become less pathological) from their level at admission.

Processing Variables Relationship to Behavioral Change

Information processing variables have been demonstrated to be the mechanisms underlying aggressive, delinquent and social difficulties among adolescents.

1c) If changes in behavior are demonstrated at discharge, it is hypothesized that the information processing variables of the Rorschach would alter as well. This is based upon the previous chapter's tenet that such processes underlie and determine problematic social behavior.

2c) Additionally, self-reported beliefs about aggressive behavior and antisociality, as well as attitudes about interpersonal relationships, would also vary as observable behavior varies. Thus, MMPI-A variables are expected to coincide with CBCL changes.

Data Collection

Admission Data

Admission data from the CBCL, YSR, MMPI-A and the Rorschach Inkblot Test were collected from each participant within the first month and a half of their stay. Each participant was administered the MMPI-A within the first week of their admission to the STU. A staff member at the STU supervised each administration. Within the first 2 to 6 weeks, each participant was administered the Rorschach Inkblot Test by one of four advanced graduate students in their fourth or fifth year of an APA accredited clinical psychology program. Each tester had at least three years experience in administration and scoring of the Exner Comprehensive System. Approximately a month into each participant's stay, staff counselors at the facility were asked to rate the participant using a Parent Form of the CBCL. For each participant, two staff counselors were given CBCLs with the instructions to "rate this person on the following behaviors over the last month". Importantly, the staff counselors who were asked to fill out the forms had extensive contact with each participant, often at the rate of 40 hours a week.

Post-STU Data

Due to the dramatic differences between the STU and the post-STU milieus, additional CBCLs were administered after the first month of the participant's entry into their post-STU treatment. As the post-STU environment is far less-restrictive than STU, the second round of data collection in this area was believed to be a more representative sample of the participant's typical behavior in more "real world" situations. Again, two

staff counselors who were familiar with the participant were asked to fill out a CBCL rating form on the participant's behavior during the first month of their post-STU treatment.

Three participants did not have completed CBCLs available due to brief lengths of stay at the facility, and two participants were not administered the second round of data because they were returned to STU due to treatment impasses. In the case of one participant, CBCLs were not returned by the staff members asked to do the ratings.

Discharge Data

When the participant was ready for discharge from the facility, the investigators coordinated a final round of data collection. In all cases, data were gathered from the MMPI-A and Rorschach within the last 2 weeks of the patient's stay at the facility. Either a staff member at the facility or one of four clinical psychology graduate students administered the MMPI-A to each participant. The Rorschach was administered by one of three clinical psychology graduate students who were trained using the Exner Comprehensive System. In all but 5 cases, different testers administered the admission and discharge Rorschachs to each participant. Finally, CBCLs were given to staff members living and working with the participant to "rate the participant on his/her behavior, during the last month of their stay only". Aside from the missing data due to elopements and early discharges, three CBCLs from the sample were misplaced or lost by the staff raters.

Data Coding

The CBCLs and MMPI-As were all scored and entered into a secured statistical database by one of two advanced graduate students in clinical psychology. An advanced graduate student in clinical psychology with greater than 7 years of experience in psychological testing and scoring coded the 110 Rorschach protocols for Exner Comprehensive System scoring variables. This coder was not blind to the time of Rorschach administration (admission versus discharge). All Rorschach scores were then entered into the statistical database.

The reliability of the Rorschach Exner scores was assessed by randomly selecting 20 protocols for separate scoring by a second rater. The second rater was an advanced graduate student in clinical psychology with over 4 years of training and practicum experience in psychological testing and scoring. The second scorer was only partially blind to the time of administration (admission versus discharge), as he administered over a half of the discharge Rorschachs. It was therefore possible for him to be familiar with some of the randomly selected protocols.

Finally, the second Rorschach rater coded all 110 protocols for the Content scores of the Rorschach (i.e., Holt, Mutuality of Autonomy and Gacono scores). Again, this rater had familiarity with a sizeable subset of the discharge data. However, the protocols were assigned dummy identifiers to hide the identity and administration time of each Rorschach in order to minimize possible rater bias. To assess reliability, another graduate student in clinical psychology with 8 years of psychological testing experience was asked to recode 20 randomly selected protocols for each of the Content scores. This coder was blind to the time of administration for the 20 protocols.

CHAPTER 4

RESULTS

Inter-rater Reliability

Following Meyer's recommendations, (1997) inter-rater reliability with the Rorschach was assessed using Kappa chance corrected reliability estimates for all of the major response segments. The Kappa for the Exner variables were as follows: Developmental Quality $r = .74$, Form Quality $r = .60$, and Z-scores $r = .68$. The Kappa for the Content scores were as follows: Mutuality of Autonomy $r = .77$, Holt-A1 $r = .67$, and AGC $r = .71$. Based upon the interpretive guidelines elaborated by Cichetti (1994), the reliability estimates for the major response segments indicate good to excellent reliability. Cichetti defines Kappa greater than .74 "excellent" reliability, .60 to .74 "good", .40 to .54 "fair" and .40 poor reliability. Inter-rater reliability was also assessed for the CBCL ratings by the staff counselors. The average Pearson r correlation between raters for the two administrations was $r = .72$ (.60, .82, .76) (df 55, 47, 48).

Descriptive Statistics

Rorschach Variables

To examine gender differences among the admission sample, one-way ANOVAs were conducted comparing males and females on the 9 Rorschach variables. Appendix A lists the means and standard deviations for the males and females on the Rorschach variables. No significant group differences emerged. To investigate the role of age on the Rorschach variables, Pearson r correlations were conducted. The correlations are

displayed in Appendix B. None of the Rorschach variables correlated significantly with age.

Group Comparison with Normative Sample

Means and standard deviations for the admission sample on the 6 Rorschach variables are listed in Table A-1. Means and standard deviations of Exner's normative sample of 15 year olds for 5 Exner variables are displayed for comparison. Because there are no normative data currently available for the DQC variable, variables for vague Developmental Quality, and vague/synthesized responses were included to provide a comparison to the normative sample.

To test the hypothesis that the admission sample would differ significantly from an age-matched normative sample on the Rorschach P-C Variables, one sample t-tests were conducted. T-values are presented on the right side of Table A-1. All four of the information processing variables were significantly higher, in a pathological direction, for the admission sample than the normative sample. The admission sample struggled more to accurately interpret the world ($X\%$, $t = 13.34$, $p < .001$), and were poorer at encoding perceptual information (ZD , $t = 2.81$, $p < .01$) than the normative sample. Likewise, they demonstrated more vague, unarticulated processing (DQv , $t = 2.23$, $p < .05$), as well as greater difficulty thinking about their experience in flexible, self-reflective ways ($F\%$, $t = 5.54$, $p < .01$).

A sample of normal children's Mutuality of Autonomy scores culled from a separate sample (Tuber, 1992) is included for comparison with the current sample's MOA scores at admission. Following the methodology of previous studies (Gacono &

Meloy, 1994, Tuber, 1992) the total mean MOA score, the mean of the highest MOA score (MOA-H) obtained, and the mean of the lowest MOA score (MOA-L) were all analyzed separately. Unfortunately, the comparison sample was comprised of male children with a mean age of 11, 4 years younger than the admission group of this study. While recent literature has suggested that the MOA may have little to do with an individual's psychological development (Blatt, Tuber, & Auerbach, 1990), there is reason to believe that MOA scores may change, as several Rorschach variables do, as a child matures. Since the comparison group consisted of males, only males from the admission sample were included in this table.

Comparisons with the known, normative sample were conducted using one sample t-tests. The means, standard deviations for both samples and the resultant t-values comparing the two samples are presented in Table A-1. Contrary to expectations, there were no significant differences between the normative sample and admission sample on MOA-L and MOA-M scores. In fact, the MOA-H score was significantly lower (i.e., less "healthy") in the normative sample than in the admission sample. The admission sample did not appear more pathological than a non-clinical group of younger children in the quality of latent knowledge structures.

The above finding is consistent with Gacono and Meloy's study, who found no mean differences between the MOA scores in age-matched conduct disorder and non-patient children. They believed that looking at various proportions of scores within each sample for comparison allowed for more subtle differences between the two groups to emerge. Following their example, chi-square analyses were run comparing the two groups on various proportions of MOA scores. Table A-2 displays the results. As in the

Gacono and Meloy study, the current sample had a greater proportion of highly malevolent MOA scores when compared to the normative group. However, differences did not emerge among the healthier MOA scores. In sum, the admission sample demonstrates having access to more pathological latent knowledge structures, but a similar access to positive schema of interpersonal relationships.

Normative data for comparison of the Gacono and Meloy scores were not available, nor were normative or conduct disordered data available for the Holt scores. Thus, Table A-1 displays means and standard deviations from the admission without comparison data.

Group Comparison with Conduct Disorder Sample

Table A-3 displays comparisons between the admission sample and conduct disorder samples occurring in the literature. For the Rorschach P-C variables, Exner's conduct disordered adolescent sample (both from Exner, 1995) was used for comparison. T-tests were conducted to test the hypothesis that the admission sample had a similar pattern of processing deficits to that of a known sample of conduct disorder adolescents. The means and standard deviations for the two groups, as well as the resultant t-values comparing the two groups' means are displayed in Table A-3. No significant differences were found for three of the four variables, indicating that the two samples had similar problematic information processing styles. However, the known conduct disorder sample had a significantly higher F% ($t = 3.25, p < .01$) than the admission sample, indicating that the earlier conduct disorder sample processed information in the world with considerably less complexity than the sample of this study.

For the Mutuality of Autonomy scores, a sample of 10 year-old conduct disordered children from a Gacono and Meloy study (Gacono & Meloy, 1994) was used. For this comparison of the MOA variables, males and females were included in the comparison sample and admission sample. Means and standard deviations for the two samples are displayed in Table A-3 along with the resultant t-values from the t-test comparison. As expected, the admission sample was found to have similar mean scores for highest, lowest and mean MOA scores, indicating that the admission sample seems to demonstrate a similar level of pathology in their conceptions of interpersonal relationships.

Finally, means and standard deviations for the AGC scores collected from a sample of conduct disordered adolescents (Gacono & Meloy, 1994) are displayed in Table A-3. Contrary to expectations, the admission sample had more responses coded for AGC than did the comparison group of conduct disorder adolescents, indicating that our sample may have a stronger tendency to attribute aggression and hostility to ambiguous situations than might be expected given previous findings.

To further describe the Rorschach data, Table A-4 displays percentages of the three samples falling into clinically significant ranges (per Exner, 1994) on 5 Rorschach scores. Comparisons were made using Chi-Square statistics. As expected, the percentage of individuals falling into clinically significant ranges varied as a function of the sample, with the normative sample having the smallest percentages of clinically significant scores in all but one of the comparisons. Although Chi-Square analyses do not indicate the direction in which the differences occurred, hypotheses can be drawn from inspection of the data. The Conduct Disorder sample had a higher proportion of

individuals who offered a clinically significant number of DQv responses than did the admission sample ($X^2 = 9.00, p < .01$). Thus, the admission sample appeared to be capable of formulating more cognitively complex interpretations of the blot than the conduct disorder sample.

MMPI-A and CBCL Variables

One-way ANOVAs were conducted to compare the 4 MMPI-A and 3 CBCL variables for gender differences. Results are shown in Appendix C. No significant differences emerged between the males and females on the variables. To investigate the role of age on the MMPI-A and CBCL variables, Pearson r correlations were conducted. The correlations are displayed in Appendix D. None of the MMPI-A or the CBCL variables correlated significantly with age.

Table A-5 displays means and standard deviations for the 4 MMPI-A scales and 3 CBCL scales of interest in this study. None of the 4 MMPI-A scales varied from the normative sample age-related adolescents. This finding is contrary to the hypothesis that the admission sample would describe themselves as having more negative, hostile attitudes toward themselves, others and society in general. On the other hand, the CBCL scores were all found to be significantly higher among the admission sample than among the normative sample. Staff members rated the admission sample as displaying more outwardly hostile and aggressive behavior (AGG, $t = 7.24, p < .01$), covertly delinquent behavior (DEL, $t = 15.09, p < .01$) and having problematic social interactions (SOC = 10.51, $p < .01$).

Table A-6 shows the percentages of the admission sample that fell into a clinically impaired range on the 4 CBCL and 3 MMPI-A variables. Results indicated that nearly half of the sample fell into a clinically significant range of impairment in the amount of social behavior and delinquency problems displayed. This is a notably high percentage considering the highly controlled and structured atmosphere of the treatment facility. Approximately a third of the sample was rated as having a clinically significant level of aggressive behavior problems. The results from the MMPI-A analyses revealed greatly lower percentages of clinical impairment in the sample. For the majority of the sample, there was little pathology indicated by their own reported attitudes and behaviors.

Treatment Outcome

In order to evaluate the hypothesis that Rorschach, MMPI-A, and CBCL variables changed from admission to discharge, paired-sample t-tests were conducted. Table A-7 displays the 9 Rorschach variables of interest in this study, along with the means and standard deviations at admission and discharge.

In examining the P-C variables of this sample from admission to discharge, the ZD score proved to be significantly different across time ($t = 2.73, p < .01$). Thus, the sample tended to be capable of processing a greater amount of information in their environment following their stay in treatment. Contrary to expectations, the sample did not demonstrate improvement in their capacity to accurately interpret information (X-%, $t = .77$), interpret perceptual information in complex ways (DQC, $t = 1.97$) or in their tendency to make more abstract, flexible interpretations of ambiguous stimuli (F%, $t = .57$). In fact, a counterintuitive trend was found for the sample to integrate information in

a more vague, unarticulated manner upon discharge (DQC, $t = 1.97$, $p < .10$). Table A-8 displays the percentages of the sample at admission and discharge falling into a clinically impaired range for 5 Rorschach variables.

The MOA-L and MOA-M scores were found to be significantly different for the sample upon discharge. The worst of the MOA responses tended to improve over time (MOA-L, $t = 2.19$, $p < .05$). Likewise, the average pathology of the responses they offered tended to decrease (MOA-M, $t = 3.22$, $p < .01$). Together, the findings indicate that the severity of disruption and malevolence in which the sample viewed relationships diminished. A significant difference did not emerge in the best of the MOA responses offered (MOA-H, $t = 1.55$). The mean AGC count was found to decrease (AGC, $t = 2.10$, $p < .05$), suggesting that the sample tended to make less aggressive and hostile attributions to ambiguous stimuli over time. Finally, the number of Holt-A1 scores decreased over time as well ($t = 2.53$, $p < .05$), reflecting improvements in their ability to make socially appropriate responses to ambiguous situations.

Due to the irregular skew and kurtosis of the distribution of some of the Rorschach variables, the concern arises that such variables would violate the assumption of a parametric procedure. Four of the Rorschach variables were selected due to their skewness (>1.50), and analyzed by the non-parametric equivalent of a paired sample t -test, the Wilcoxon signed ranks test. Table A-9 displays the results. The MOA-M, AGC, and Holt-LVL 1 scores all showed significant differences in mean rank from admission to discharge in the expected direction. The MOA-H variable showed a trend ($p < .10$) for the most healthy, integrated perceptions of interpersonal relationships to improve for the admission sample upon their discharge.

Table A-10 displays means and standard deviations from the selected MMPI-A and CBCL variables compared at admission and discharge. Of the 4 MMPI-A variables assessed, the CYN and ALN scales were found to diminish over time. Adolescents in this sample demonstrated an improved capacity to trust others in interpersonal relationships (CYN, $t = 3.25$, $p < .01$) and believed others to be more understanding and sympathetic (ALN, $t = 2.05$, $p < .05$) when discharged from treatment. However, neither the CON nor the ANG scale changed from admission to discharge. Thus, the sample did not alter their typical attitudes and beliefs about society (CON, $t = .34$) nor their attitudes about the appropriateness of angry outbursts and physical assaultiveness (ANG, $t = .31$). Table A-10 displays the percentages of sample at admission and discharge that fall into a clinically impaired range for the MMPI-A variables.

Table A-10 also displays comparisons of the three CBCL scales of inquiry in this study. All three composite scores were found to decrease across time. Compared to their initial behavior ratings, the sample was rated as displaying less aggressive behavior (AGC, $t = 3.82$, $p < .05$), fewer covert conduct problems (i.e., lying, stealing, cheating, etc.) (DEL, $t = 6.49$, $p < .01$) and less difficulty within social relationships (SOC, $t = 5.77$, $p < .01$). Table A-10 displays the percentages of sample at admission and discharge that fall into a clinically impaired range for the CBCL variables.

Examining Influences Among Difference Scores

To examine the possible influence of gender upon admission-to-discharge difference scores, one-way ANOVAs were run comparing males and females on the outcome variable change scores. Results are displayed in Appendix E. There were no

differences between the males and females on any of the difference scores from admission to discharge on the Rorschach or CBCL scales. It is therefore unlikely that the gender of the sample was a meaningful factor contributing to the differences on the variables from admission to discharge. Among the MMPI-A variables, 1 of the 4 scales, the CYN scale, change from admission to discharge varied as a result of gender, with females showing a larger decrease in the amount of cynicism and suspiciousness with which they viewed relationships. With the large number of group comparisons made, however, it may be that this difference was simply due to chance.

The role of the participant's age upon the outcome variables was examined as well. Pearson r correlations were conducted on the change scores for the Rorschach, CBCL and MMPI-A variables. Appendix F displays Pearson r correlations between age and difference scores of the outcome variables. There proved to be no correlation between age and the changes in the outcome variables of the MMPI-A and CBCL scales, indicating that age did not contribute a significant influence upon who changed in treatment. That is, younger children did not appear to change more than older children or vice-versa. Of the 9 Rorschach variables, 8 Rorschach variables were found to have non-significant relationships with age. Changes in the Holt-A1 scores did appear to have a positive relationship with age suggesting that the older children were more likely to make larger improvements in their ability to access socially appropriate responses than were the younger children. Again, due to the large number of correlations run, the likelihood of 1 in 17 correlations being significant by chance cautions such an interpretation.

Pearson r correlations were also conducted with the outcome variable difference scores and length of stay. Results are displayed in Appendix G. There were no

significant correlations between length of stay and the changes in the outcome variables of the MMPI-A and CBCL scales, indicating that changes in these variables was not effected by how long the individual was in treatment. Of the 9 Rorschach variables, all were found to have non-significant relationships to length of stay.

The absence of a significant correlation between length of stay and the change scores offers some evidence against the influence maturation effects may have had upon changes in the outcome variables. That is, if maturation effects were causal in pre to post changes in the variables, one would expect that a relationship between length of stay and the outcome variables would emerge. In other words, if maturation effects were at play, it might be expected that those who stayed longer in treatment would demonstrate larger changes than those who had shorter stays. While this finding does not rule out the role of maturation effects on the sample (perhaps individuals ceiling out at the amount of change they make, no matter what the stay), it clearly does not *support* such a contention.

Addressing Alternative Hypotheses for Outcome Changes

Rorschach Variables

Although statistically significant differences have emerged on several hypothesized variables, it is unclear if these changes may be better accounted by another, correlated or more general factor. For example, researchers have speculated that the MOA may simply reflect a facet of global psychopathology (Blatt, et al., 1990). Therefore, it could be that changes evidenced on the MOA score are simply an artifact of other, more global changes on the Rorschach, such as improved interpersonal coping

skills. To test this contention, analyses were run upon related Rorschach variables to discern changes from admission to discharge.

There are some alternative explanations to consider in understanding changes in the ZD score at discharge. Improvements in the ability to encode perceptual information might be explained by global cognitive improvements among the participants, or it might be suggestive of a group that has become more hypervigilant or, alternatively, obsessional in their cognitive style (Exner, 1993). To test these alternative hypotheses, paired sample t-tests were run comparing changes in general thinking problems (SCZI) and hypervigilance (HVI) from admission to discharge. The OBS index, which assesses the presence or absence of an obsessional cognitive style of the test-taker, offers a “yes” or “no”, rather than a score. It was, therefore, not included in this statistical analysis.

Appendix H shows the results. The sample displayed no significant changes from admission to discharge on the SCZI ($t = 1.35$, $p = .183$) or HVI ($t = 1.27$, $p = .21$) variables. The sample appeared similar with respect to the degree of cognitive impairment and the amount of hypervigilance they displayed on the Rorschach at discharge. Furthermore, there were no participants in the sample who were positive on the OBS index at admission or at discharge. It appears unlikely that changes in ZD are better accounted by a more general factor or correlated variables on the Rorschach.

As was noted earlier, investigators have suspected that the MOA score may be tapping into general psychological well being. Therefore, it is possible that MOA-M and MOA-L decreases are an artifact of general diminishment of psychological distress or interpersonal coping deficits over time. Alternatively, the changes in MOA may be indicative of decreased egocentricity, or greater interest in human relatedness. To

examine differences in psychological distress the sample made at discharge, paired-sample t-tests were run for the Rorschach Depression Index (DEPI) and D-score (D), a measure of situational stress an individual experiences (Exner, 1993). Changes the sample made at discharge with respect to their general interpersonal coping abilities were assessed by a paired-sample t-test of the Coping Deficit Index (CDI). Finally, changes on the Egocentricity Index (EGO) and total number of human content (SUM H) variables assessed the participant's level of egocentricity and interest in human relatedness, respectively. Changes the participants made in the total number of texture responses (SUM T) were also compared to assess the participants' interest in sensory human contact.

Appendix H displays the results of these analyses. No significant differences were observed from admission to discharge for the amount of situational distress (D, $t = 1.42$, $p = .16$), affective dysfunction (DEPI, $t = .939$, $p = .35$) or interpersonal coping skills (CDI, $t = 1.11$, $p = .27$). This finding suggests that changes in MOA-M and MOA-L from admission to discharge do not appear related to more global improvements in psychological functioning or decreases in affective disturbance. Instead, they seem to reflect specific changes in a discrete area of psychological functioning, the quality of object relations. Finally, there were no changes evident on the variables assessing egocentricity (EGO, $t = .356$, $p = .72$), interest in human relatedness (SUM H, $t = 1.24$, $p = .22$) or interest in physical human contact (SUM T, $t = 1.36$, $p = .18$).

Alternative explanations for AGC and Holt-A1 changes were also examined. Changes in AGC could potentially be due to changes in the amount of oppositionality or anger the individual experiences, or may be a manifestation of a general tendency to see

more damaged imagery in the blot, regardless of whether it is of a hostile or aggressive nature. Changes in the Holt-A1 score might be due to decreases in the amount of global bizarre ideational processes occurring among the sample. In other words, changes may be better explained by general problems accessing appropriate responses than by changes the group made in accessing aggressive responses specifically.

To assess changes in oppositionality and anger the sample made over time, the number of Space responses at admission and discharge were compared. To examine a bias within the sample to interpret ambiguous stimuli as damaged or ruined, the number of Morbid responses (MOR) on the Rorschach were examined at admission and discharge. To examine the amount of general ideation problems, the weighted sum of Rorschach special scores (WSUM6) at admission and discharge was compared.

Due to the high skew and kurtosis of the Space, Morbid and Wsum6 variables, the non-parametric equivalent of a paired-samples t-test, the Wilcoxon Signed Ranks test, was performed to compare the variables. Appendix I displays results for the alternative variables tested. No significant differences emerged in the amount of Space responses ($z = 1.72, p = .09$) or Morbid responses ($z = 1.52, p = .13$). Thus, it does not appear that the amount of change in oppositionality or biases interpretations of damaged, broken percepts adequately accounts for the decreases in AGC at discharge. Likewise, the sample made no significant change on the WSUM6 variable ($z = .58, p = .56$), indicating that the sample made specific changes in the area of accessing aggressively laden responses, and can not be better explained as reflective of more global progress in accessing appropriate responses.

MMPI-A Variables

Research has demonstrated that a number of high correlations exist among scales on the MMPI-A (Archer & Krishnamurthy, 1994). Thus, the changes that occurred on the ALN and CYN are susceptible to being accounted for by changes in either related variables, or more general factors on the MMPI-A. To address these concerns, the DEP, PD and PA scales, which are highly correlated and/or conceptually related to the ALN and CYN scales were examined (Archer & Krishnamurthy, 1994).

Research conducting factor-analysis of the MMPI-A has identified nine reliable, general factors that account for the overwhelming majority of variance on the test. The ALN and CYN scores have been found to be clustered around the more global General Maladjustment (MAL), Immaturity (IMM), and Disinhibition/Excitatory (DIS) factors (Archer & Krishnamurthy, 1994). These were examined in order to discern whether a general change in psychopathology across any of these factors better accounts for post-treatment changes on the two scales. Paired sample t-tests were conducted to evaluate admission-to-discharge changes that occurred along these 6 variables.

Appendix J displays the results of the statistical comparisons. No significant changes were found among the three correlated scales. The sample did vary from admission to discharge on the DEP ($t = 1.15$, $p = .25$), Pd ($t = .85$, $p = .40$) or Pa ($t = 1.18$, $p = .27$) scales. Likewise, no changes were evidenced on the three general factor scores [(MAL, $t = 1.19$, $p = .24$), (IMM, $t = 1.02$, $p = .31$), and (DIS, $t = 1.05$, $p = .30$). This supports the finding that the sample made distinct, specific changes at discharge in two areas thought to be highly relevant to externalizing behavior problems.

CBCL Variables

The changes on the CBCL variables of this study, DEL, SOC and AGG were also notable. In previous studies examining the factor structure of the CBCL, the test has been best understood as measuring two factors, externalizing and internalizing behavior (Achenbach, 1991, Greenbaum & Dedrick, 1999). At the same time, an argument for a one-factor model can also be made; however, it does not appear to be as good a fit for the variables as the two-factor solution (Achenbach, 1991).

The SOC, DEL and AGG have been found to load highly on a general externalizing factor of the test, while the SOC variable also loads highly on the internalizing factor of the test (Achenbach, 1991, Greenbaum & Dedrick, 1999). Appendix J displays the results of the paired-sample t-tests conducted on the two factors of the CBCL. The Externalizing factor of the CBCL was found to change significantly at discharge ($t = 5.58, p < .001$) as did the Internalizing factor ($t = 5.631, p < .001$). It is unclear what the meaningfulness of the SOC, AGG, DEL scales represent independently. The scales are highly correlated and thus may simply be statistically arbitrary groupings of behavior that hold only face validity. It is likely that changes on these three scales can be better understood as emblematic of more general declines in externalizing behavior, or perhaps overall behavior, the sample displayed upon discharge.

Predicting Behavioral Changes with the Rorschach and MMPI-A Variables

It was hypothesized that positive changes in the Rorschach variables would be associated with behavioral improvement. In evaluating the relationship between the Rorschach and CBCL variables, the Exner variables and Content variables were analyzed

separately. This was done to examine separately the influence of variables that directly assess cognitive processing and the variables that are related to the content of responses. A principal components factor analysis with varimax rotation confirmed that the Rorschach variables are constructed along these two groupings, as displayed in Appendix K. In Factor 1, the primary loadings were AGC (.53), MOA-M (.74), MOA-L (.85), and Holt-A1 (.59) which had an eigenvalue of 2.1 comprising 26% of the variance. Factor 2 had loadings for F% (.65), X-% (.56), ZD (.64) and DQC (.65), which accounted for 22% of the variance with an eigenvalue 1.8.

The relationships among the Rorschach variables were analyzed prior to the CBCL relationships, and are shown in Table A-12 and A-13. Among the P-C variables, a significant, negative correlation existed between pre-to-post changes in F% and X-% ($r = .31, p < .34$); individuals who improved with respect to their reality testing capacities also improved their capacity to think in more abstract, sensitive ways. Examining the Content variables, significant correlations occurred between changes in Holt-A1 scores and the MOA-L scores ($r = .44, p < .05$) and, not surprisingly, between the MOA-M and MOA-L scores ($r = .61, p < .001$). It seems that individuals who made changes in their ability to access more socially appropriate responses at discharge also had improved in the way they unconsciously anticipated relationships to be.

Since the AGG and DEL difference scores are highly related ($r = .69, p < .001$), it was decided to drop the variable less related to direct aggressive behavior, DEL, from the analyses. After analyzing correlations within the predictor variables, correlations were run among the Exner variables and two CBCL variables, to determine if information processing changes were associated with behavioral change. Results are displayed in

Table A-14. No significant correlations were found, and in fact were quite weak, with all but one of the correlations falling between $r = .00$ and $.15$. Correlations were also performed between the Rorschach content variables and the CBCL variables. Again, no significant correlations were found, with the majority of correlations ranging between $r = .00$ and $.20$. Based upon the limited relationship among the Rorschach and CBCL variables and lack of potential mediating variables (the weak correlations between length of stay, age, and gender, and the Rorschach variables), it was decided not to run regression with the Rorschach variables.

Finally, the relationship between changes in the MMPI-A variables and the CBCL were examined. It was expected that changes in MMPI-A variables would relate to observed differences in behavior. First, the relationship among the MMPI-A variables was examined, the result of which is displayed in Table A-15. Significant correlations were found among all four variables. Decreases in CYN were related to decreases in CON ($r = .68, p < .001$), decreases in ANG ($r = .56, p < .001$), and decreases in ALN ($r = .48, p = .001$). Decreases in CON coincided with decreases in ANG ($r = .68, p < .001$), and decreases in ALN ($r = .46, p = .001$). Additionally, differences in ANG were associated with differences in ALN ($r = .51, p < .001$). Next, the correlations between the MMPI-A difference scores and CBCL difference scores were assessed. The correlations are displayed in Table A-16. Differences in the CYN scale was found to be positively related to differences in AGG ($r = .43, p < .01$), and SOC ($r = .43, p < .01$), as was the case with CON scores [AGG ($r = .56, p < .001$), SOC ($r = .38, p < .05$). Differences in the ANG scale at discharge were related to diminished AGG ratings ($r =$

.44, $p < .01$), and decreases in ALN were also positively associated with lower AGG ratings at discharge ($r = .41$, $p < .05$).

To further investigate the relationship of the MMPI-A variables to the changes in the CBCL measures, forward stepwise regressions were conducted. The four MMPI-A variables were entered into the regression equation until the addition of the variables ceased to enhance the ability to predict the outcome variables ($p < .05$), first with respect to AGG and then with the SOC variable. Results are displayed in Table A-17. The analyses indicated that for changes in the AGG scale, the CON scale of the MMPI-A emerged as the only nonredundant predictor ($r = .72$, $r\text{-squared} = .50$, $p < .001$). While all four of the MMPI-A scales were highly correlated with AGG, CON alone was able to account for the majority of the variance in the equation. In this sample, changes in CON scores are found to be a very powerful predictor of changes in the AGG scale. Thus, differences the participants made in their self-reported attitudes about social behavior and their report of how likely they were to act in antisocial ways had a strong connection to changes in observations of aggressive behavior.

In attempting to predict changes in SOC scores from the MMPI-A variables, changes in CYN was the only nonredundant input variable ($r = .43$, $r\text{-squared} = .18$, $p = .001$). Again, only one of the four MMPI-A variables was necessary to account for the majority of the variance in the CBCL scale. CYN scale changes appear to be a useful predictor in the change individuals made in their ability to socialize with peers effectively. Individuals who changed in their reported cynicism and suspiciousness in relationships demonstrated improvements in their social relationships.

Finally, Table A-17 displays the results of the forward stepwise regression with the MMPI-A scales used to predict changes in overall externalizing and internalizing behavior. As noted earlier in this chapter, the AGG and SOC scales appear to be an artifact of the more general changes the sample made on the EXT scale. As was the case with the AGG variable, changes in the CON scale emerged as the sole non-redundant variable predicting changes in externalizing behavior ($r = .65$, $r\text{-square} = .45$, $p = .001$). Changes the sample made upon the CON scale appear very closely associated with drops in externalizing behavior ratings. The same was true when predicting changes on the INT scale. Although a weaker predictor, difference scores on the CON scale was found to be the lone non-redundant predictor of changes on INT ($r = .35$, $r\text{-square} = .12$, $p < .05$). Changes in CON appears highly associated with changes in overall behavior ratings among this sample.

CHAPTER 5

DISCUSSION

Admission Data

Rorschach Variables

As anticipated, the sample of adolescents in this study differed from non-clinical adolescents in their capacity to process information. At admission, they were dramatically poorer at scanning their environment adequately for relevant information (ZD) and made a significantly higher number of distortions in interpreting their world (X-%) than is typical of adolescents. Their ability to formulate complex and well-defined understandings of perceptual information is impaired (DQ scores) as is their ability to think more flexibly and sensitively about their environment (F%), when compared to nonpatient peers. Generally speaking, this sample of patients is severely handicapped in their ability to encode, interpret and formulate responses within their social milieu.

The admission sample appeared similarly impaired in their processing abilities when contrasted with an age-matched conduct disordered sample. As expected, the two groups were comparably handicapped in encoding (ZD) and interpreting (X-%) their environment as well as formulating a complex understanding of this information (DQv). The current sample, however, appeared to be slightly less concrete and rigid in their thinking style as a whole than did their counterparts from a previous study. However, it appears that the two groups were comparable when contrasting the percentage within each sample who fall into a clinically significant range in this processing area. The difference between the two groups on F%, while statistically significant, may be of little

clinical significance. These samples are similar in that they both vary significantly from their age-matched non-patient counterpart and the percentage of individuals falling in a clinically impaired range within the two samples are comparable.

These findings not only confirm the existing literature findings regarding the problems conduct disorder adolescents have processing information, but also suggests that there seems to be a fairly consistent pattern to their information processing deficits in the Rorschach. In addition, the Rorschach appears to be an effective, and perhaps a more effective, means of assessing information-processing tendencies compared with many measures described in the literature. This is because the Rorschach is an “on-line” task of information processing compared to other measures existing in the literature, which tend to rely upon the participant answering questions, post hoc, concerning what they *remember* processing. The Rorschach does not suffer from this problem. It assesses information-processing tendencies by coding participants based upon their responses in real time.

Surprisingly, the sample from this study did not appear to be as distinct from non-patient children in measures of their internal representations of relationships as was hypothesized. There are many reasons why this finding may have occurred. Importantly, the ages of the two samples (15 and 10, respectively) may have played a more important role in the group differences than expected. There may be a tendency for younger children to appear more disturbed in their understandings of interpersonal relationships on the MOA measures by virtue of their place in development, making the comparison between the two groups an artifact of the 5-year age difference between groups. However, the failure to find significant differences on the MOA variables between

conduct disordered and normal samples is not unique to this study. Gacono and Meloy (1994) found no differences occurring between age-matched samples of conduct disorder children and nonpatient children. Instead, there appeared to be a non-significant trend for the conduct disorder sample to have less pathological MOA scores (for MOA-M, MOA-H, and MOA-L) than the nonpatients. Indeed, the MOA scores for the adolescent sample and the conduct disorder sample from a previous study appeared very similar, despite their age difference.

Beyond the role age may have played, why significant differences did not occur is not immediately clear. Gacono and Meloy re-analyzed their data to examine proportional differences between the two samples on the MOA scores. They found the conduct disorder sample had a smaller proportion of responses receiving scores 1 and 2 (the more healthy scores) than the nonpatient children, while having a higher proportion of scores falling at 6 and 7 (the more pathological scores). Conducting a similar analysis with the current data, we found the sample having higher proportions of significantly malevolent scores than the nonpatient sample (MOA scores 6 and 7), a finding consistent with the Gacono and Meloy study. Gacono and Meloy concluded that “proportional measures of level of object relations are statistically more powerful than average or distributional measures in these populations” (Gacono & Meloy, 1994, p. 32).

From the findings of the current study, it appears that conduct disordered adolescents consistently have high proportions of responses consistent with highly negative, destructive and malevolent relationship schemata. This finding supports previous studies reporting links between children and adolescents with externalizing behavior problems and pre-existing negative schemata about relationships. The

additional finding that the two groups do not differ in the number or proportion of positive MOA responses deserves mention. It may be the difference between groups is not their access to schemata of relationships that are benign or mutual, but rather to the presence of knowledge structures of relationships that are imbued with malevolence and destructiveness. Children (and perhaps adolescents) may not have the experience of referencing highly negative relationship models when they are processing social information.

MMPI-A and CBCL Variables

Compared to the Rorschach variables, the MMPI-A variables of the current sample are remarkably similar to non-patient adolescents. None of the four scales of inquiry in this study proved to be significantly higher, or more pathological, in the sample when compared to a normative sample. In fact, the admission sample appeared to report less severe social alienation than normal adolescents, although the difference was far from being clinically meaningful. Generally speaking, the admission sample was not describing significant problems in several areas directly tied to externalizing behavior disorders.

The CBCL data were more aligned with the study's hypotheses. When rated by staff members well acquainted with the participants of this study, the sample was significantly higher than a normative sample in the amount of aggressive and delinquent behavior they displayed, as well as overall socialization problems. Importantly, the average of the current sample on the three scales was a standard deviation higher than the

normative sample, suggesting that this group is different from typical adolescents in a way that is clinically meaningful.

In sum, there appear to be no group differences between the normative sample and admission sample on the MMPI-A, while dramatic, clinically relevant differences distinguish the same two groups on the CBCL and Rorschach variables. One possible explanation for the disparity lies in the measurement modality. The MMPI-A is highly vulnerable to test-taker bias. This is especially pertinent for the current sample, a group of adolescents generally characterized by tendencies to externalize problems, difficulty recognizing their own limitations and vulnerabilities objectively, and a lack of consciously experienced interpersonal and social distress. While such test taking biases are thought to be detected by the validity scales of the MMPI-A, there were no differences between the sample and normative group when possibly invalid MMPI-As were removed from subsequent analyses. Furthermore, less than half of the participants in this sample had *at least one* MMPI-A scale at admission fall in the clinically significant range of 65 or greater. Given the significant degree of clinical impairment required for an individual to be admitted to the treatment facility, it is likely that the pathology of this sample was not adequately tapped by the MMPI-A.

This is not an altogether new finding. Previous studies have found that abundantly low levels of psychopathology are indicated when using the MMPI-A in similar samples as the current one. Often, clinical scale elevations appear similar across clinical and non-clinical populations. Archer, Handel, and Lynch (2002) have discussed that the MMPI-A scales have particular difficulty in discriminating between normative and clinical samples within inpatient samples. In their study of a large sample of

inpatient adolescents, McGrath, Poge and Stokes (2002) found that the majority of clinical and content scales of the MMPI-A fell within a standard deviation (i.e., 10 points) of the mean for the normative sample. Using the MMPI-A to tap pathology from an information processing lens, therefore, may not be useful among this population.

Outcome Variables

Rorschach Information Processing Variables

In analyzing the changes this sample made on the Rorschach information processing variables at discharge, mixed findings emerged. Contrary to this study's hypotheses, three of the four Rorschach P-C variables did not change. The sample did not improve their capacity to interpret perceptual information in a consensually valid way (X-%), were equally concrete and narrow in their information gathering tendencies (F%), and were no better able to formulate responses in complex ways (DQC) than before they started treatment. In short, they remained quite impaired in three main areas of information processing. However, the sample did change with regard to the amount of perceptual information they were able to process (ZD). As a group, the sample was capable of encoding more perceptual information than before. The change also appeared to be clinically relevant; the percentage of the sample that was clinically impaired at discharge dropped from 35% to 12%. The change in this variable was not statistically related to their gender, to his or her age at discharge, nor to how long they spent in treatment. Likewise, the change in ZD could not be accounted for by other, related or more general variables on the Rorschach. Instead, changes in ZD appear to represent important, relevant progress in their ability to encode perceptual information.

Has the sample changed from a group that encoded too little perceptual information, to one that encoded too much? The percentage of individuals who processed too much information ($ZD > 3.00$) rose from 14% at admission to 35% at discharge. Thus, the sample shifted from being very narrow to very broad in the attention they paid to their environment, to the point where roughly a third of the sample seemingly became hypervigilant. This finding is not novel nor does it seem to be a troublesome one. Exner (1978), in a study of long-term therapy patients, found that the percentage of overincorporators grew from 17% at pretreatment, to 25% at 18-months to 37% at 24-month retest. He concluded that this change may be of benefit to the patient as psychological treatment places an emphasis on “a greater attentiveness to, and searching through stimuli” (pg. 454, Exner, 1993). Thus, it is plausible that a positive change for the majority of the participants has taken root; in order to begin to interpret the world in a new light, the individual must begin to widen the aperture of their information processing style.

The paucity of change in other areas remains unclear. One possibility is that there simply was not enough time for changes in the other areas to happen. While previous studies have demonstrated differences in F% and X-% across time, the effect sizes have been smaller than they have for ZD (Weiner & Exner, 1991) or the time in treatment has been longer (Abraham et al., 1994). Exner has also contended that the ZD score is “corrected somewhat easily by most forms of intervention” (Exner, 1993, pg. 454). The three other variables, however, appear to be more temporally durable. As has been described by Exner, X-%, F-%, and DQC represent more enduring, stable processes not as easily changed (Exner, 1993).

Rorschach Content Variables

A change among the 5 Rorschach Content variables was more evident than the P-C variables. The sample showed significant improvement with regard to the pathology in which they anticipated relationships (MOA-L, and MOA-M) the amount of hostile and aggressive attributions they made (AGC) and the ability to access socially appropriate responses (Holt-A1). The changes the sample made upon these variables bore no association with age, gender or length of stay. Furthermore, changes among these variables could not be better-accounted for by more general or correlated variables, such as general affective distress or global thinking problems.

The MOA-H score, which represents the responses indicative of the most healthy and benign of relationship schema available, did not alter. Recalling the results earlier in this chapter, only more pathological MOA scores successfully differentiate the admission sample from the sample of nonpatients. It appears that the malevolence of MOA scores may be the area in which change is necessary. That changes occurred only among the lowest and mean MOA responses indicates treatment may be mediating the individual's unconscious expectations of relationships as malevolent or destructive. Since the admission sample was similar to normal samples in the positive, benevolent relationship models at their disposal, the sample appears less in need of making improvements in what the MOA-H is tapping.

There is a notable disparity between the changes observed among the P-C variables and the Content variables. As mentioned earlier, there seem to be important differences between the two sets of variables. The P-C variables are measures of early stage information processing that are related to cognitive skill and have little to do with

abstractions such as “hostility” or “aggressivity” of the percepts. On the other hand, the Content variables are not related to perceptual-cognitive abilities but instead are tapping the emotional and relational quality of the Rorschach responses. Related to the differences between the two sets of variables is the understanding that perceptual-cognitive skills are highly stable, enduring qualities of the individual’s personality. However, the constructs that the Content variables address are seemingly more dynamic. The disparity in changes between the two sets of variables may relate to this factor.

Riethmiller, looking at this same sample, (Riethmiller, 2002), found the majority of Rorschach variables representing more stable personality factors evaluated did not change across time. Citing Rinsley, Riethmiller speculated that changes in these variables are likely to occur only after a significant lapse of time has occurred, an amount beyond the average length of stay in this study. He concluded that deeper changes in personality must happen in the context of the adolescent being capable of adequately trusting their treatment environment. Results from this study suggest the latter might be occurring. While the more enduring, “structural” variables may not have altered, indicators of improved trust in their environment (the MOA variables) have altered. It may be then that the sample has become more capable of trusting their caregivers thereby setting the stage for deeper changes to occur.

Importantly, Dodge and colleagues have statistically demonstrated that latent knowledge structures function as a mediating factor between information processing tendencies (similar to the P-C variables of this study) and aggressive behavior (Dodge et al., 2002). The investigators concluded that latent knowledge structures of relationships “guides behavior at a general level...by influencing information-processing patterns”

(Exner, 1993, pg. 69). It follows then that altering these variables in externalizing adolescents may be a necessary prerequisite for processing patterns to change.

There are other possible reasons behind the disparity between changes among the P-C variables and Content variables. The variables have been shown to differ in the extent to which conscious manipulation is possible with Content variables when contrasted with the I-P variables (Dies, 1995). Despite being told that the testing had no bearing on their discharge status, it might nonetheless be possible that the sample appeared to be seeking to appear “better” in their responses. This may have influenced the sample into censoring aggressive or sick responses they may have otherwise offered. However, it is unclear if the sample would be wishing to look better at discharge anymore than they would like to at admission. The potential motivation to dissimulate seems to be as equally strong at admission as it is at discharge, as the adolescent is equally likely to wish to appear healthy at both stages. Additionally, both the MOA and AGC scores rate the subject’s responses on qualities not immediately obvious. In the instance of the MOA scores, many responses that appear healthy on the surface (e.g., “two people in love that share the same heart”) are actually scored in a pathological direction. Likewise, seemingly neutral percepts such as “teeth”, “bear” or “gargoyle” all are coded for AGC scores. Nonetheless, the fact that the MOA, Holt-A1 and AGC responses do come under conscious control more readily than the P-C variables leaves such a possibility open.

MMPI-A Scores

Changes across time occurred in 2 of the 4 MMPI-A variables. The sample seemed to be less suspicious, cynical and mistrustful toward others (CYN scale), and

believed people to be more sympathetic and understanding toward them (ALN scale).

The changes on these two scales were not correlated with the age of the participant or the amount of time the participant was in treatment. Females appeared to make larger changes than the males on the CYN scale. Furthermore, changes on more general factors or correlated scales on the MMPI-A did not result, indicating that CYN and ALN changes are not better explained by related variables or a broader factor of psychological functioning.

The sample did not diminish the degree of asocial general attitudes and beliefs they held toward the world (CON), nor in attitudes and beliefs associated with potential anger and physical assaultiveness (ANG). Interestingly, the two variables most closely associated with the way in which they perceive interpersonal relationships altered, but more general social attitudes and beliefs did not seem to alter. This finding is consistent with the samples' changes upon the Rorschach Content variables; the group appears to have significantly changed the way in which they anticipate and perceive interpersonal relationships.

This finding is also important with respect to the question of whether the sample dissimulated upon discharge. In this case, the sample appeared unmotivated to alter their responses in a "healthier" direction. It seems less likely, then, that the group would appear motivated to alter Rorschach responses but not self-report items that clearly have antisocial connotations.

CBCL Variables

Changes among the CBCL variables were unilateral and in the expected direction. The staff who rated the sample found them to be exhibiting less aggressive behavior, delinquent behavior and social problems. Furthermore, these changes had significant clinical relevance: The percentage of the sample with clinically significant socialization problems fell from 50% to 14%, the percentage with significant aggression problems dropped from 31% to 16% and the percentage rated with significant delinquency problems diminished from 47% to 16%. The mean for the three behavioral ratings dropped from above a standard deviation to the mean, to within a half of a standard deviation of the mean. The changes were not related to gender, age or length of stay among the sample. It is, however, questionable if changes on the individual SOC, AGG and DEL scales are meaningful. Treatment may best be understood as targeting general behavior problems, and that treatment effects are not exclusive to the set of behaviors SOC, AGG and DEL represent. Treatment appears to be aiding the sample in any number of ways, behaviorally.

Again, accounting for the disparity between the P-C Rorschach changes and the CBCL changes are likely to be similar to the disparity between the P-C variables and the MMPI-A and Content Rorschach variables. Changes in observable behavior, especially in the controlled treatment center of this study are more amenable to change than are perceptual-cognitive abilities. This has been a point of contention in several outcome studies that have used behavioral ratings as measures of change (e.g, Curry, 1991, Wells, 1991). The behavior changes may represent the samples' assimilation to their environment, a willingness to accommodate themselves to the demands of the therapeutic

milieu. One can readily imagine the scenario where internal psychological processes do not alter while external behavior does change. Behavior change may occur if an individual is dissimulating in order to appear healthy or if an individual is making an earnest adaptation to their milieu. With regard to the latter motivation, the behavior change would represent a willingness to adapt or trust their treatment environment. It may be that such an adaptation, much like the relational and attitude changes occurring, must occur prior to changes in enduring, stable personality characteristics. Assessing these same variables at some point beyond discharge is the only means of testing these hypotheses.

Predicting Behavioral Changes from the Rorschach and MMPI-A

Contrary to hypotheses, changes among the Rorschach variables did not appear related to changes in behavioral ratings in this sample. Given the lack of change among the sample on the Rorschach P-C variables (DQC, F%, X-%), it is not surprising that they would have little value in predicting behavior change. Scattergrams describing relationship among the outcome and the P-C variables depicted a random association between the two sets. That is, individuals who made changes in the P-C variables were just as likely to have been rated as changed behaviorally than those individuals who made no, or negative changes. Part of this may be due to the homogeneity of the sample, or lack of sample size. Most studies that have examined information processing variables relationship to aggressive behavior have used larger, more heterogeneous samples, often utilizing clinical and non-clinical groups in the same study. The majority of the current sample displayed significant pathology in information processing skills, thereby

minimizing the variability among the P-C variables. With a larger variation in processing liabilities, like that which would be available if a non-patient group was included, could improve the association between behavior and P-C variables.

There appeared to be no relationship between changes in the Content variables of the Rorschach and changes on the CBCL. A closer examination of the data through the use of scattergrams indicated no trend between changes in the Content variables and changes in the CBCL variables. As was the case with P-C variables, individuals who improved upon AGC, MOA-L, MOA-M, and Holt-A1 scales were not necessarily the individuals whose aggressive behavior or social problems declined. Instead, the relationship between the two sets of data appeared random.

A much stronger relationship existed between changes in the MMPI-A variables and the CBCL variables. Individuals who reported greater declines in CYN, CON, ANG, and ALN scales at admission were more likely to be the ones making greater decreases in their aggressive behavior. While the four MMPI-A scales have minimal item overlap, the scales do appear to be highly correlated with one another, likely tapping one overall construct related to negativistic, antisocial attitudes and relationships. Indeed, when a forward stepwise regression equation was conducted on the four variables, only one of the scales, CON, provided non-redundant predictive value to the equation. Furthermore, changes in CON proved to be the only non-redundant predictor for the more general externalizing and internalizing behaviors.

Individuals who were rated as having fewer social problems by their staff at discharge were likely to demonstrate drops in CYN and CON at discharge. A forward stepwise regression indicated that changes in the CYN scale accounted for the majority of

the variance in changes on the SOC scale, and was the only non-redundant predictor variable. However, given that changes in SOC seem to be better understood as a part of more general improvements in behavior ratings, this finding is of limited import. As was mentioned previously, changes in CON emerged as the only significant, non-redundant predictor of overall behavior changes.

Both MMPI-A findings speak highly of the criterion validity of the scales that served as predictor variables for behavioral change. Changes in CON, which assesses an individual's self-reported tendency to be in trouble because of their behavior and more generally, antisocial attitudes, emerged as a very strong predictor of decreases in aggressive and overall externalizing and internalizing behavior. Meanwhile, changes in CYN, a scale that measures how mistrustful, suspicious and exploitative one expects others to be in relationships, was the variable most associated with decreases in interpersonal difficulties affecting an individual.

With regard to the hypotheses of this study, CYN and CON are tapping constructs very relevant to information processing tendencies. The CYN scale seems to be measuring the presence of negativistic, hostile, suspicious attitudes about personal relationships, which they use to structure their understanding of relationships. Likewise, the CON scale appears to be measuring, in information processing terms, values and goals they have for social interactions which are in part determining how the person decides to behave. If the individual comes to value less antisocial attitudes and behaviors, as is thought to happen if the CON scale is changing, they are more likely to opt for behaviors that reduce the possibility of antisocial or aggressive action.

When compared to the Rorschach variables, the MMPI-A scales assessing conscious attitudes, beliefs and ideas about themselves and the world seem far more related to visible behavior change. This is true even in the case where the MMPI-A and Rorschach Content variables that are tapping related aspects of information processing. Why might this be? One possible explanation is that Rorschach Content variables are indirectly assessing these processes, while the MMPI-A relies upon the individual's self-report. In the case of the Rorschach P-C variables, the person's ability to interpret reality, process visual information, respond in cognitively and emotionally flexible ways are assessed through the individual's response to ambiguous stimuli. The MMPI-A variables, however, seem to be tapping into different constructs, namely attitudes and beliefs that underlie or shape information processing tendencies.

• Compared to the Rorschach variables, MMPI-A variables appear more vulnerable to conscious manipulation. The Rorschach variables are less capable of being manipulated, especially in the case of the P-C variables. The underlying factor that might be responsible for the relationship between the MMPI-A and CBCL then, might be the motivation to appear good in the eyes of themselves and/or their staff, rather than actual changes. It stands to reason that self-reported changes on the attitudes and behaviors tallied on the CON scale would be related to behavior ratings in general. As has been the case in many previous studies assessing outcome at residential treatment centers, changes occur in self-report and behavioral measures prior to discharge, but fail to hold after discharge. Again, only a study that assesses these variables beyond discharge could adequately investigate this contention. It remains to be seen if such changes are authentic, or are a by-product of conscious or unconscious dissimulation.

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APPENDICES

Table A-1**Rorschach Means and Standard Deviations for Normative and Admission Sample**

	Admission Sample (n=49)		Normative Sample (n=110)		
	Mean	SD	Mean	SD	t-value
Exner P-C Scores					
DQC	1.43	.27	N/A	N/A	-----
DQv	1.22	1.48	.75	1.29	2.23*
ZD	-1.27	5.72	1.03	2.96	2.81**
X-%	.32	.13	.07	.05	13.34**
F%	.44	.16	.30	N/A	5.54**
Mutuality of Autonomy Scores <i>1</i>					
MOA-H	1.94	1.31	2.74	1.59	3.13**
MOA-L	5.03	1.47	5.00	1.20	0.13
MOA-M	3.46	1.09	3.83	1.07	1.84
Gacono and Meloy Score					
AGC	5.27	3.44	N/A	N/A	-----
Holt Score					
HOLT-A1	.59	.98	N/A	N/A	-----

**= $p \leq .01$ * = $p \leq .05$ ¹ = Comparison of only male subjects (Admission Sample = 30, Normative Sample = 40)

Table A-2

Comparison of MOA Proportions for Admission Sample and Nonpatient Children

	Admission N = 49	Normative N = 110	X2
<i>Percentage of Subjects</i>			
Best Response 1 or 2	83%	75%	NS
At least one response 3	47%	50%	NS
At least one response 4	49%	3%	26.84**
Worst Response 5-7	68%	60%	NS
Worst Response 7	13%	0%	6.38*
<i>Percentage of Frequencies</i>			
Responses 1 and 2	41%	50%	NS
Response 3	13%	16%	NS
Response 4	17%	2%	7.11**
Response > 5	29%	33%	NS
Response 5	12%	25%	NS
Response 6	13%	7%	NS
Response 7	4%	0%	NS
Malevolent (5-7) at 5	41%	77%	13.30**
Malevolent (5-7) at 6	45%	23%	12.19**
Malevolent (5-7) at 7	14%	0%	7.53**

**= a X2 p-value of $\leq .01$

* = a X2 p-value of $\leq .05$

Table A-3

**Rorschach Means and Standard Deviations for Admission and Conduct Disorder
Samples**

	Admission Sample (n=49)		Conduct Disorder Sample		
	Mean	SD	Mean	SD	t-value
Exner P-C Scores¹					
DQC	1.43	.27	N/A	N/A	
DQv	1.22	1.48	1.41	1.76	0.88
ZD	-1.27	5.72	-0.91	4.77	0.44
X-%	.32	.13	.29	.05	1.70
F%	.44	.18	.53	N/A	3.25**
Mutuality of Autonomy Scores²					
MOA-H	1.94	1.31	1.95	1.42	0.66
MOA-L	4.90	1.65	4.72	2.08	0.73
MOA-M	3.37	1.06	3.33	1.56	0.27
Gacono and Meloy Score³					
AGC	5.17	2.94	3.18	2.80	3.69**

**= $p \leq .01$

* = $p \leq .05$

1= C.D. Sample included 140 subjects

2= C.D. Sample included 60 subjects

3= Comparison of only male subjects (Admission Sample = 30, C.D. Sample = 79)

Table A-4**Rorschach Percentages for Admission, Normative and Conduct Disordered Samples**

	Admission	15 year olds	CD Sample
	N = 49	N = 110	N=100
Exner P-C Scores			
DQv + DQv/+ >3	8%	N/A	32%**
ZD> 3.0	14%	23%	26%
ZD< 3.0	35%	15%	21%*
X-% > .15	90%	02%	51%**
Lambda > .99	45%	07%	31%**

**= a X2 p-value of $\leq .01$

* = a X2 p-value of $\leq .10$

Table A-5

MMPI-A and CBCL Means and Standard Deviations for Admission and Normative Samples

	Admission		Normative		
	Mean	SD	Mean	SD	t-value
MMPI-A Scales					
ALN	46.73	9.37	50.00	10.00	2.43**
ANG	49.49	12.41	50.00	10.00	.29
CON	50.78	10.98	50.00	10.00	.49
CYN	48.47	10.53	50.00	10.00	1.01
CBCL Scales					
EXT	62.64	7.97	50.00	10.00	9.70***
AGG	60.41	8.82	50.00	10.00	7.24***
DEL	64.82	6.37	50.00	10.00	15.09**

***= $p \leq .01$

** = $p \leq .05$

Table A-6**Admission MMPI-A and CBCL Scales in Clinically Impaired Range**

Scales	Percentages
MMPI-A Scales	
CON ≥ 65	14%
ANG ≥ 65	12%
CYN ≥ 65	2%
ALN ≥ 65	4%
CBCL Scales	
SOC ≥ 65	50%
AGG ≥ 65	31%
DEL ≥ 65	47%

Table A-7

Rorschach Means and Standard Deviations at Admission and Discharge

	Admission		Discharge		
	Mean	SD	Mean	SD	t-value
Exner P-C Scores					
DQC	1.43	.27	1.37	.27	1.97*
ZD	-1.27	5.72	1.43	4.64	2.73***
X-%	.32	.13	.30	.13	.77
F%	.44	.13	.43	.13	.57
Mutuality of Autonomy Scores					
MOA-H	1.87	1.25	1.57	1.08	1.55
MOA-L	4.87	1.68	4.15	1.66	2.19**
MOA-M	3.31	1.04	2.75	1.00	3.22***
Gacono & Meloy Score					
AGC	5.25	3.48	4.23	3.09	2.10**
Holt Score					
HOLT-A1	.59	.98	.25	.53	2.53**

***= $p \leq .01$

** = $p \leq .05$

* = $p \leq .10$

Table A-8**Rorschach Indices in Clinically Impaired Range at Admission and Discharge**

	Admission	Discharge
Exner P-C Scores		
DQv + DQv/+ >3	8%	1%
ZD> 3.0	14%	34%
ZD< 3.0	35%	12%
X-% > .15	90%	86%
Lambda > .99	45%	41%

Table A-9**Rorschach Z-Scores for Admission to Discharge Changes**

	Wilcoxon-test
	z-score
MOA-H	1.79*
MOA-M	3.152***
AGC	2.12**
HOLT- A1	2.46**

***= $p \leq .01$ ** = $p \leq .05$ * = $p \leq .10$

Table A-10

MMPI-A and CBCL Means and Standard Deviations at Admission and Discharge

	Admission		Discharge		
	Mean	SD	Mean	SD	t-value
MMPI-A Scales					
ALN	46.73	9.58	43.51	8.60	2.05**
ANG	49.49	12.41	48.80	13.27	.31
CON	50.78	10.98	50.10	12.51	.34
CYN	48.47	10.53	42.98	11.48	3.25***
CBCL Scales					
SOC	64.34	8.10	57.74	7.13	5.77***
AGG	60.41	8.82	56.58	6.89	3.82**
DEL	64.82	6.37	57.63	5.70	6.49***

***= $p \leq .01$

** = $p \leq .05$

Table A-11

MMPI-A and CBCL Scales within an Impaired Range at Admission and Discharge

	Admission	Discharge
MMPI-A Scales		
CON ≥ 65	14%	18%
ANG ≥ 65	12%	16%
CYN ≥ 65	2%	0%
ALN ≥ 65	4%	4%
CBCL Scales		
SOC ≥ 65	50%	14%
AGG ≥ 65	31%	16%
DEL ≥ 65	47%	16%

Table A-12

Pearson r Correlations among Rorschach Exner P-C Variables

	Exner P-C Scores		
	DQC	X-%	F%
ZD	.26	.14	.27
F%	.27	.31*	
X-%	.24		

* = $p < .05$

Table A-13
Pearson r Correlations among Rorschach Content Variables

	Content Scores		
	AGC	MOA-M	MOA-L
HOLT-A1	.21	.23	.26
MOA-L	.26	.61*	
MOA-M	.44*		

* = $p < .01$

Table A-14
Pearson r Correlations between Rorschach and CBCL Variables

	AGG	SOC
Exner P-C Scores		
DQC	-.03	.07
F%	.13	.15
X-%	.15	-.10
ZD	.15	.20
Content Scores		
AGC	.21	.13
MOA-M	-.03	-.19
MOA-L	-.23	-.24
HOLT-A1	.20	.07

Table A-15
Pearson r Correlations among MMPI-A Variables

	MMPI-A Scales		
	ALN	ANG	CON
CYN	.48**	.56***	.68***
CON	.46***	.68***	
ANG	.51***		

* = $p < .01$, ** = $p \leq .001$,

Table A-16
Pearson r Correlations between MMPI-A and CBCL Variables

	AGG	SOC
MMPI-A Scales		
CON	.72***	.38*
CYN	.43**	.43**
ALN	.41*	.18
ANG	.44**	.31

* = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table A-17

Stepwise Regression Summary of MMPI-A Changes to Predict CBCL Changes

AGG Scale				
Variable	R	R-Square	F-Change	p-value
CON	.72	.52	37.37	.000***
SOC Scale				
Variable	R	R-Square	F-Change	p-value
CYN	.43	.18	7.80	.009***
EXT Scale				
Variable	R	R-Square	F-Change	p-value
CON	.63	.39	22.49	.000***
INT Scale				
Variable	R	R-Square	F-Change	p-value
CON	.35	.12	4.77	.036*

*** = $p < .001$

* = $p < .05$

Appendix A

Rorschach Means and Standard Deviations of Males and Females at Admission

	Male		Female		
	Mean	SD	Mean	SD	F
Exner P-C Scores					
ZD	-0.97	5.65	-1.74	5.95	.21
X-%	33.73	14.12	29.79	11.62	1.03
F%	44.20	19.08	43.90	17.90	.00
DQC	1.43	.28	1.42	.26	.02
Mutuality of Autonomy Scores					
MOA-H	1.93	1.41	1.94	1.16	.00
MOA-L	5.03	1.47	4.67	1.94	.54
MOA-M	3.46	1.09	3.22	1.02	.59
Gacono & Meloy Score					
AGC	5.17	2.94	5.42	4.18	.06
Holt Score					
HOLT-A1	.63	.96	.53	1.02	.13

Appendix B

Pearson r Correlations between Rorschach Variables and Age

Variable	Pearson r
Exner P-C Scores	
DQC	.03
F%	-.12
X-%	-.05
ZD	-.10
Gacono and Meloy Score	
AGC	-.15
Mutuality of Autonomy Scores	
MOA-M	-.04
MOA-H	-.15
MOA-L	.00
Holt Score	
HOLT-A1	.17

Appendix C

MMPI-A and CBCL Means and Standard Deviations of Males and Females at Admission

	Male		Female		
	Mean	SD	Mean	SD	F
MMPI-A Scales					
ALN	47.17	9.65	46.05	9.15	.16
ANG	49.40	13.38	49.63	11.05	.00
CON	49.23	11.73	53.21	9.46	1.54
CYN	47.90	11.80	49.36	8.38	.22
CBCL Scales					
AGG	59.88	9.70	61.24	9.00	.21
DEL	65.20	5.60	64.06	7.40	.32
SOC	64.78	9.36	63.53	8.13	.20

Appendix D

Pearson r Correlations between Age and MMPI-A & CBCL Scales

Scale	Pearson r
MMPI-A Scales	
CON	.01
ANG	-.12
CYN	-.18
ALN	.00
CBCL Scales	
SOC	-.26
AGG	.00
DEL	.02

Appendix E

Rorschach, MMPI-A and CBCL Difference Score Means and Standard Deviations of Males and Females

	Male		Female		
	Mean	SD	Mean	SD	F
Rorschach Scores					
DQC	.07	.21	.04	.22	.21
F%	.00	.13	.03	.13	1.42
X-%	.02	.14	.02	.15	.00
ZD	.40	6.95	3.16	7.00	.14
MOA-M	.63	1.32	.48	.99	.16
MOA-H	.32	1.54	.28	.96	.01
MOA-L	.75	2.24	.72	2.45	.00
AGC	.55	3.40	1.74	1.44	.24
HOLT-A1	.35	.76	.26	.99	.10
MMPI-A Scales					
ALN	2.00	11.90	5.16	.94	.96
ANG	-.50	16.63	2.57	14.89	.43
CON	-.30	14.05	2.21	12.87	.40
CYN	2.80	12.47	9.74	9.60	4.26*
CBCL Scales					
AGG	3.17	10.25	4.69	6.46	.27
DEL	7.95	6.60	6.19	7.00	.62
SOC	6.29	7.72	7.00	6.01	.09

* = $p \leq .05$

Appendix F

Pearson r Correlations between Age and Difference Scores on Rorschach, MMPI-A & CBCL Variables

Variables	Pearson r
Rorschach Scores	
DQC	.05
F%	.02
X-%	-.05
ZD	-.08
AGC	.06
MOA-H	-.14
MOA-L	-.09
MOA-M	-.02
HOLT-A1	.32*
MMPI-A Scales	
CON	.04
ANG	.00
CYN	.00
ALN	-.14
CBCL Scales	
SOC	-.34*
AGG	-.07
DEL	.23

* = $p < .05$

Appendix G

Pearson r Correlations between Length of Stay and Difference Scores on Rorschach, MMPI-A and CBCL

Variable	Pearson r
Rorschach Scores	
DQC	-.17
F%	.21
X-%	-.34*
ZD	.08
AGC	.06
MOA-H	-.05
MOA-L	-.25
MOA-M	-.09
HOLT-A1	.01
MMPI-A Scales	
CON	.03
ANG	-.14
CYN	.02
ALN	-.14
CBCL Scales	
SOC	-.25
AGG	.11
DEL	.04

* = $p < .05$

Appendix H

Admission to Discharge Changes in Alternative Rorschach Variables

	Admission		Discharge		
	Mean	SD	Mean	SD	t-value
Alternatives to ZD					
SCZI	3.56	1.76	3.21	1.74	1.35
HVI	3.21	1.69	3.58	1.62	1.28
Alternatives to MOA					
DEPI	4.27	1.30	4.50	1.22	0.93
D-score	-0.76	1.75	-1.12	1.67	1.42
CDI	2.71	1.20	2.92	1.30	1.11
EGO	0.33	0.20	0.34	0.17	0.72
SUM H	2.20	2.18	2.59	2.15	1.24
SUM T	0.24	0.63	0.39	0.64	1.36

Appendix I

Alternative Rorschach Variables Z-Scores for Admission to Discharge Changes

Wilcoxon-test	
z-score	
<hr/>	
Alternatives to AGC	
MOR	1.52
Space	1.72
 Alternative to Holt-A1	
WSUM6	0.58

Appendix J

Admission to Discharge Changes in Alternative MMPI-A Variables

	Admission		Discharge		
	Mean	SD	Mean	SD	t-value
MMPI-A Alternatives					
MAL	0.20	0.24	0.15	0.21	1.19
IMM	0.18	0.21	0.15	0.19	1.02
DIS	0.22	0.18	0.19	0.19	1.05
DEP	52.29	9.90	48.47	10.05	1.15
PD	60.27	8.82	59.00	8.40	0.85
PA	53.61	9.71	52.00	7.70	0.27
CBCL Alternatives					
INT	67.22	6.83	57.50	7.65	5.63***
EXT	62.64	7.97	55.01	9.03	5.58***

Appendix K

Factor Structure of the Eight Rorschach Variables

Rorschach Scores	Factor Loadings*	
	1	2
DQC	-----	.65
F%	-----	.65
X-%	-----	.64
ZD	-----	.56
AGC	.53	----
MOA-M	.74	----
MOA-L	.85	----
HOLT-A1	.59	----
Eigenvalue	2.1	1.8
Variance	.26	.22

*Only factor loadings of .35 or greater are shown

Vita

Dennis Plant currently lives in Cambridge, Massachusetts and works at the Cambridge Health Alliance. In 1994, Dennis received his B.A. in psychology from Vanderbilt University. While at Vanderbilt, he became interested in personality assessment and collaborated with Dr. Leslie Morey, the author of the Personality Assessment Inventory. Following graduation, Dennis was hired at the Diabetes Research and Training Center at the Vanderbilt University Medical Center. There he worked beside Dr. David Schlundt, collaborating in research studying the behavioral dynamics specific to adult and adolescent individuals suffering from diabetes. He co-authored two journal articles published in *Journal of Psychopathology and Behavioral Assessment* and *Patient Education and Counseling*.

In 1997, Dennis was accepted to the University of Tennessee as a doctoral candidate through the Department of Clinical Psychology. While at Tennessee, Dennis became interested in tracking personality changes resulting from psychological intervention. Through his collaboration with Dr. Leonard Handler, he engaged in several research studies that resulted in numerous paper presentations at the Society for Personality Assessment and the Tennessee Psychological Association Annual Conferences, as well as two co-authored publications in the *Journal of Personality Assessment*. In 1999, Dennis completed his Master of Arts in General Psychology at the University of Tennessee.

While at Tennessee, Dennis became heavily involved in clinical work as a psychotherapist and psychological tester. He served 2 years at Cherokee Health Systems as a clinical psychology trainee, and was contracted by Cherokee in 2001 to conduct

psychotherapy in West Knoxville. In 2001, Dennis received his Psychological Examiner License and began to work with Child and Family Services as a psychological examiner conducting assessments for adolescents entering the state domestic services program. Meanwhile, he became closely involved with the Appalachian Psychoanalytic Society, where he deepened his interest in the field of psychoanalysis.

In 2002, Dennis was accepted as a Predoctoral Intern at the Harvard Medical School, where he worked as an outpatient psychotherapist and inpatient clinical coordinator at the Cambridge Hospital. At present, he is a Postdoctoral Fellow at the Harvard Medical School, conducting intensive psychoanalytic psychotherapy at the Cambridge Health Alliance's Program for Psychotherapy. Following the Fellowship, he plans on pursuing psychoanalytic training in the Boston area. Dennis plans on conducting psychoanalysis and psychoanalytic psychotherapy in private practice, and wishes to continue clinical and research endeavors in the field of personality assessment.