AN EXAMINATION OF FACETS OF THE GENERAL AGGRESSION MODEL

Kimberly A. Maurelli

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Dissertation Committee:

George Ronan, Ph.D.	Committee Chair
Donna Ronan, Ph.D.	Faculty Member
Debra Poole, Ph.D.	Faculty Member
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Roger Coles, Ed.D.	Dean College of Graduate Studies
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ABSTRACT

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by Kimberly A. Maurelli

In an attempt to add to the research literature on aggression and treatment, the purpose of this study was two-fold. First, this study derived two stress scales from items that are specifically relevant to an offender population. No psychometrically sound, publicly available measures of stress have been created for use with offender samples. This process entailed selecting items that were conceptually related to stress from self-reported and clinician-rated measures of demographic information, aggression, and risk for future violence routinely completed by offenders referred to anger management treatment. The second purpose of this study was to examine the applicability of facets of the General Aggression Model to an offender sample. Using archival data from an anger management sample, this study examined whether stress, measured by the scales constructed in part one, predicted aggression, and if this relationship was mediated by social problem solving. The results suggested that reported stress, both clinician-rated and self-reported, could predict aggression; however, this relationship was not significantly mediated by social problem solving skills.

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CHAPTER I

INTRODUCTION

Aggression and violence are pervasive concepts in modern day culture, and archaeological evidence indicates that aggression and violence were present in ancestral societies more than 25,000 years ago (DeWall & Anderson, 2011). Aggressive behavior, defined as "any behavior directed towards another individual that is carried out with the proximate intent to cause harm" (Anderson & Bushman, 2002, p. 28), and violent behavior, defined as "aggression that has extreme harm as its goal" (Anderson & Bushman, 2002, p. 29), have negative consequences for not only those involved in the specific incidences, but for society as a whole. As a result of this detrimental impact, much research has been conducted to explore the causes of aggression and to develop effective treatment programs to reduce violent behavior.

This study investigated if components of a major aggression theory could be identified, and whether hypothesized relations between these components could be replicated, using a clinical sample. The final goal was to validate proposed relations between person factors, reported stress which represented a combination of person and situation factors, and subsequent aggression.

Frustration-Aggression Hypothesis

In the 1930s, aggression became an identified social problem that psychologists began to research fervently. A group of Yale researchers formally proposed the frustration-aggression hypothesis in 1939 (Dollard, Doob, Miller, Mowrer, & Sears, 1939). The frustration-aggression hypothesis was to become the basis for the majority of aggression-related research conducted in the following decades (Berkowitz, 1989). Although the hypothesis has been altered and

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undergone modifications, the basis of the frustration-aggression hypothesis first proposed 70

years ago remains today as a monumental influence on aggression research.

The idea that frustration and aggression are related predates this formal proposal, and

early scholars such as William James and William McDougal both referred to this potential

relationship. William James argued that aggression is regulated by a tribe (i.e., an in-group) and

is expressed against competitors. According to Dollard et al. (1939), these competitors can be

viewed as either actual or potential frustrators. William McDougal reported that aggression is an

"instinct of combat" that is aroused by an "obstruction" (i.e., frustration) (Dollard et al., 1939).

Dollard and colleagues (1939) argued that both scholars were referring to the same connection

between frustration and aggression as presented formally in the frustration-aggression

hypothesis.

Although William James and William McDougal both made comments regarding the

connection between frustration and aggression, it was Sigmund Freud who first formally

presented this relationship (Dollard et al., 1939). Freud proposed that the blockage of pleasure-

seeking or pain-avoiding behavior results in frustration and that the "primordial reaction" to this

frustration is aggression (Dollard et al., 1939). Freud elaborated this theory and stated that the

target of this aggression was often the individual or thing deemed responsible for causing the

frustration (Dollard et al., 1939).

Dollard used Freud's writings when formulating his own general principles of frustration

and aggression. The frustration-aggression hypothesis stated that "aggression is always a

consequence of frustration" (Dollard et al., 1939, p.1). Dollard and colleagues (1939) proposed

that, when individuals are faced with internal or external barriers during their pursuit of goals,

they experience frustration. Frustration, defined as "an interference with the occurrence of an

instigated goal-response at its proper time in the behavior sequence" (Dollard et al., 1939, p.7), could lead to a variety of behavioral responses including some that are aggressive. Miller, Sears, Mowrer, Doob, and Dollard (1941) proposed that individuals possess a hierarchy of behavioral responses that are activated when faced with frustration. Miller et al. (1941) suggested that aggressive responses would be at different levels within the hierarchy depending on the individual and the particular frustration. Miller and colleagues (1941) postulated that as individuals implemented non-aggressive actions in an effort to reduce the source of their frustration and were unsuccessful, their likelihood for engaging in aggressive actions would increase. Thus frustration was considered to be an external barrier that prevents someone from reaching his or her goals. In order to determine that a frustration had occurred, two things needed to be verified: (a) that it was possible to conclude that the individual would carry out certain acts, and (b) that something occurred to prevent these acts (Dollard et al., 1939). The Yale group defined aggression as "any such sequence of behavior, the goal-response to which is the injury of the person toward whom it is directed" (Dollard et al., 1939, p. 9).

The first revision to the frustration-aggression hypothesis came shortly after the hypothesis was formally put forth. Neal Miller, working with the rest of his Yale colleagues, Sears, Mowrer, Doob and Dollard, released an article entitled "*The Frustration-Aggression Hypothesis*" in 1941. The article was a response to many of the criticisms that had been leveled at the hypothesis due to its claim that "the existence of frustration always leads to some form of aggression" (Miller et al., 1941, p. 338). Miller rephrased the statement to better represent the authors' intent: "Frustration produces instigations to a number of different types of response, one of which is an instigation to some form of aggression" (Miller et al., 1941, p. 338). Miller and colleagues went on to explain the existence of a hierarchy of instigations that are aroused by

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frustrating situations. The instigation to aggression would be at different levels in this hierarchy depending on the individual and the particular frustration. The responses that were highest in the hierarchy would be attempted first, and in many situations these would be non-aggressive. If these responses were successful in reducing the original frustrated response, then the strength of the motivation towards aggression would be reduced and as a result aggressive actions would be less likely to occur. However, if these non-aggressive responses were tried and did not lead to a reduction in the original instigation, then the next highest responses in the hierarchy would be attempted. The more non-aggressive responses that were attempted and failed to reduce the original frustrating instigation, the more likely it would become that an instigation to aggression would lead to an actual occurrence of aggression (Miller et al., 1941).

Miller and colleagues (1941) also set forth a more complete definition of frustration. They postulated frustration could be represented by an external barrier, but frustration could also be represented by an internal emotional reaction that occurs from an inability to achieve one's goals. This form of frustration occurs if the individual had anticipated a desirable outcome. The strength of the aggressive response generated by the frustration depends on the degree of satisfaction the individual expected to achieve by reaching the goal. This theory has been able to account for situations in which an aggressive response does not follow a frustration, proposing that in such instances non-aggressive responses occur because the aggressive urge is weak, inhibitions due to threat of punishment are strong, or the individual has developed other ways of responding to frustration (Miller et al., 1941).

Leonard Berkowitz attempted to reformulate the frustration-aggression hypothesis in 1962 and re-examined the hypothesis again in 1989. Prior to this, the basic formulation had remained essentially unchanged. Berkowitz (1989) suggested that the frustration-aggression

relationship was simply a special case of a more general connection between aversive stimulation and aggressive inclinations. Specifically, he argued that a frustrating event would increase the likelihood of engagement in aggressive behavior only to the degree that the frustrating event generated negative affect (i.e., anger). Thus anger is an intervening variable between the frustrating stimulus and the aggressive response (Robarchek, 1977). In support of anger as a mediating variable, unexpected events have been found to lead to aggressive responses more frequently than expected events because unexpected events are often perceived as more unpleasant and thus produce greater negative affect. Many of the factors identified by Dollard et al. (1939) as influencing the strength of the aggressive response are related to the degree of anger aroused. For example, Dollard et al. (1939) identified the intensity of the drive and the extent to which a goal is blocked as factors relevant for understanding an individual's propensity to engage in aggressive behavior. If the drive had strong intensity, interference would produce greater feelings of unpleasantness than if the drive had weaker intensity. Likewise, if a goal were completely blocked greater feelings of unpleasantness would occur than if a goal were partially or temporarily blocked. Berkowitz argued that what was important was the degree to which the interference resulted in negative affect (Berkowitz, 1989).

<div align="center">Studies Supporting the Frustration-Aggression Hypothesis</div>

Support for the frustration-aggression hypothesis has been accumulating since the 1940s. Hovland and Sears (1940) examined the relationship between economic conditions (e.g., farm value, cotton value) and lynchings of African Americans in the South between 1882 and 1930. They found a correlation of -.67 between economic conditions and lynchings, indicating that lynchings were more prevalent during times of economic hardship as expected by the frustration-aggression hypothesis (Hovland & Sears, 1940).

<div align="center">5</div>

More recently Catalano, Novaco, and McConnell (1997, 2002) examined the relationship between layoffs and violence. Using time-series methodology, they identified a parabolic pattern representing the relationship between layoffs and aggression (operationalized as number of civil commitments for presenting a danger to others). They found incidences of civil commitment for presenting a danger to others increased as layoffs increased until a ceiling was reached, at which point increasing layoffs did not result in further commitments. The authors suggested that the parabolic curve was accounted for by the "inhibition effect," which suggests that individuals threatened with job loss or seeking to re-enter the work force will regulate their behavior in order to avoid negative consequences (Catalano et al., 1997). Fischer, Greitemeyer, and Frey (2008) found that college students who anticipated not finding employment after graduation reported higher levels of self-reported aggression and evidenced more aggression during a laboratory task (i.e., ice-water paradigm) compared to students who anticipated finding work. A follow-up study verified that unemployed individuals continued to report higher levels of self-reported aggression compared to employed individuals. These effects were moderated by self-awareness, with increased aggression occurring under conditions of low self-awareness (Fischer et al., 2008).

Numerous studies have found support for the frustration-aggression hypothesis at the individual level. Studies involving adults, children, and animals have found that aggressive behaviors increase when individuals are prevented from reaching a desired goal (Azrin, Hutchinson, & Hake, 1966; Buss, 1963; Ulrich, 1966). For example, Berkowitz (1983) conducted a study that indicated physical pain (which produces frustration and negative affect) provoked animals and humans to attack an available target. Psychological discomfort has also been shown to lead to aggressive actions, such that individuals exposed to disgusting images

become hostile afterwards presumably because the images arouse unpleasant feelings (Zillmann,

Bryant, Comisky, & Medoff, 1981).

Recently the frustration-aggression hypothesis has been applied to research on violent

videogame play. Williams (2005) examined the effects of frustration, violence and trait hostility

on videogame play. The variable of interest was state hostility, which Williams (2005) described

as possessing the same cognitive and affective components present during aggressive acts.

Williams (2005) found frustration during game play led to increases in state hostility, after

controlling for trait hostility. This occurred regardless of videogame content, although the effect

was more pronounced when violent content was included in the videogame (Williams, 2005).

The frustration-aggression hypothesis continues to exert a significant influence on

aggression research today. In addition to being the impetus for numerous research studies, the

frustration-aggression hypothesis has informed more recent conceptualizations of aggressive

behavior. The General Aggression Model (Anderson & Bushman, 2002; Anderson & Carnagey,

2004) incorporated findings from the frustration-aggression hypothesis, as well as additional

variables, to provide a more comprehensive explanation of aggressive behavior.

General Aggression Model

The General Aggression Model (GAM), developed by Anderson and colleagues

(Anderson & Bushman, 2002; Anderson & Carnagey, 2004), provides an integrative framework

for understanding human aggression. It is a social-cognitive, developmental model designed to

integrate existing theories of human aggression into a coherent framework (DeWall & Anderson,

2011). In order to account for varying types and degrees of aggressive behavior (e.g.,

instrumental, reactive), the GAM characterizes aggression along four dimensions: "degree of

hostile or agitated affect present, automaticity, degree to which the primary goal is to harm the

victim versus benefit the perpetrator, and degree to which consequences are considered"

(DeWall & Anderson, 2011, p. 18). Knowledge structures are a key feature of the GAM that

account for previously specified developmental models regarding the acquisition and

maintenance of aggressive behavior (Anderson & Bushman, 2002). Knowledge structures are

believed to arise from experience; influence understanding and perception of events at multiple

levels (e.g., selective attention to sources of potential threat); exert influence automatically

through continued use; contain links to emotional states, behavior sequences, and beliefs; and

influence individuals' interpretations and behavioral responses to environmental stimuli

(Anderson & Bushman, 2002). Thus knowledge structures develop through experience and exert

an influence on future events.

The GAM examines how aggression unfolds in the context of a single social interaction

by considering features of the individual, the situational context, the individual's present internal

state, and outcomes of decision-making (Anderson & Bushman, 2002). Although the focus is on

single episodes, past and future events play a role. Individuals possess features that influence

how they respond to situations, which are a result of their past learning histories (Anderson &

Bushman, 2002). The influence of future events is represented by the individual's expectations

for behavior, future plans, and personal goals, which also influence responses to specific

incidents (Anderson & Bushman, 2002).

Factors that influence aggression are categorized as person features or situation features

within the GAM (Anderson & Bushman, 2002). Person features or factors refer to all

characteristics of an individual that influence aggression, including personality traits, beliefs, and

genetic history (Anderson & Bushman, 2002). Person factors that are often implicated include

knowledge structures, traits (e.g., self-esteem), sex differences (which are understood by

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examining differential affective responses between sexes), beliefs (e.g., confidence in one's ability to successfully engage in aggressive behaviors), attitudes (e.g., acceptance of violence), values, long-term goals, and behavioral scripts (Anderson & Bushman, 2002). Situation factors refer to all aspects of the situation that are relevant for aggression, including the occurrence of a provoking incident or aggressive cues (Anderson & Bushman, 2002). Common situational factors identified include aggressive cues, provocation, frustration, physical or psychological discomfort, substances, and incentives (Anderson & Bushman, 2002).

Person and situation factors influence each other and affect aggression through their influence on cognition, affect, and arousal (Anderson & Bushman, 2002; DeWall & Anderson, 2011). The effect of person and situation factors on cognition includes increases in hostile thoughts and activation of aggressive scripts (Anderson & Bushman, 2002). Person and situation factors can directly influence mood by increasing negative emotional states like anger and causing involuntary motor responses to occur in response to experienced emotions (e.g., muscle contractions resembling a frown in response to anger or frustration) (Anderson & Bushman, 2002). Lastly, person and situation factors can exert effects on physiological and psychological arousal, which in turn influences aggression (Anderson & Bushman, 2002). These internal states are interconnected, such that increases in aggressive-related content in one domain can influence aggressive-related content in another (e.g., increases in hostile cognitions can increase negative affect and arousal) (Anderson & Bushman, 2002).

In the GAM, person and situation factors are believed to influence internal states, which in turn influence appraisal and decision-making processes that directly affect the outcomes of the situation (DeWall & Anderson, 2011). Two types of appraisals can occur at this stage: "immediate appraisal" and "reappraisal" (Anderson & Bushman, 2002). Immediate appraisal

occurs automatically and includes three components: affect (i.e., fear and anger-related affect), goals, and intention (i.e., intent to engage in aggressive behaviors) (Anderson & Bushman, 2002; DeWall & Anderson, 2011). Person factors, situation factors, and the individual's present internal state influence the immediate appraisal process (DeWall & Anderson, 2011). The present internal state, in particular, exerts a large influence on the type of automatic inference that is made (Anderson & Bushman, 2002). For example, an individual who has aggressive thoughts activated and is in a heightened state of arousal is more likely to perceive an individual cutting them off in traffic as a potential threat than an individual who does not have aggressive thoughts activated and whose arousal state is lower.

If the individual has adequate resources and motivation, a reappraisal process may occur (Anderson & Bushman, 2002; DeWall & Anderson, 2011). The reappraisal process relies on controlled processes to search for pertinent information about the incident, retrieve relevant information from memory, and identify alternative solutions to the problem at hand (DeWall & Anderson, 2011). This reappraisal process results in deliberate action being taken, whether of an aggressive or non-aggressive nature (Anderson & Bushman, 2002). The action taken then informs the individual's knowledge structure and can influence future episodes (DeWall & Anderson, 2011).

The GAM has been used to explain incidents of aggression in numerous contexts including intimate partner violence, violence between groups, violence resulting from global climate change, and suicide (DeWall & Anderson, 2011; DeWall, Anderson, & Bushman, 2011). It has also been used to explain high rates of non-violence in certain cultures (DeWall et al., 2011). The GAM provides a useful framework for understanding human aggression because it subsumes many theories of aggression into a coherent whole.

The GAM proposes that situation and person factors must be addressed in order to reduce aggressive behavior. Similar to the original therapeutic goal proposed to emerge from the frustration-aggression hypothesis, i.e., "helping the client learn to deal effectively with the frustration" (Lewis & Bucher, 1992, p. 386), the GAM would suggest that as individuals learn to engage in the reappraisal process and identify alternative solutions, their likelihood for aggression will decrease. The skills learned would represent person factors, which directly impacts their experience of frustrating situations as well as their ability to cope with the frustrations.

Situation Factors

One important situation factor is the amount of stress or frustration an individual must contend with during problem situations. Stress has been found to influence a variety of behavioral and mental health phenomenon including eating habits, substance use, psychological disorders (e.g., depression), and susceptibility to diseases (e.g., cancer, heart disease) (Baum, Trevino, & Liegey Dougall, 2011; Bekkouche, Holmes, Whittaker, & Krantz, 2011; Grunberg, Shafer Berger, & Hamilton, 2011; Gutman & Nemeroff, 2011; O'Conner & Conner, 2011). It is reasonable to suspect that stress also plays a significant role in an individual's response to problem situations, because of the impact it exerts on emotional, physical, and mental functioning. However, understanding the influence of stress can be complicated by the myriad of definitions that exist for "stress."

Stress Definitions

Stress has been defined in a variety of ways in research studies, and definitions of stress can broadly be broken down into three categories: response-based definitions, stimulus-based

definitions, and appraisal-based definitions. Early researchers (e.g., Cannon, 1932; Selye, 1950, 1956) conceptualized stress as a biological response triggered by external or internal stimuli (i.e., stressors). The presence of physiological changes during a stress response has been supported in the research literature, however the notion that stress is only a physiological process has been refuted (see Frankenhaeuser, 1975; Lazarus & Folkman, 1984). Later researchers conceptualized stress as a response to a stressor that incorporated psychological (e.g., anger, anxiety), as well as physiological, changes (Lobel & Dunkel-Schetter, 1990). The newer response-based definition accounted for more factors relevant to stress reactions, such as increases in negative emotional states (e.g., anger, anxiety) that often co-occur with physiological stress-related changes. However, this definition has been met with criticism because of its circularity and failure to account for features of the situation or the individual that would influence the stress response (Lobel & Dunkel-Schetter, 1990).

An alternative method of defining stress has been stimulus-based definitions, which equate stress with a stressor (Contrada, 2011). In this approach, stress is measured objectively by assessing the number of major life events (e.g., bereavement, war) or other phenomena experienced by an individual that are expected to elicit stress responses (Contrada, 2011; Lobel & Dunkel-Schetter, 1990). For example, life stress has been conceptualized as the occurrence of severe life events (Monroe & Harkness, 2005), or the occurrence of severe life events in conjunction with mild but longer lasting negative events or "hassles" (Monroe & Harkness, 2005; Weinberger, Hiner, & Tierney, 1987). Unfortunately stimulus-based definitions are also problematic because research suggests people respond to similar events differently and specific events do not elicit equal levels of distress across individuals. Therefore factors other than the

external stimulus (i.e., stressor) must be playing a role (Contrada, 2011; Lobel & Dunkel-Schetter, 1990).

A third method of defining stress is an appraisal-based approach that conceptualizes stress as an interaction between a stressor (e.g., external or internal stimulus) and the individual's perception of the stressor (Lazarus, 1966; Lazarus & Folkman, 1984; Lazarus & Launier, 1978). This definition postulates that if the individual appraises the stressor to present a significant threat of harm, and the individual appraises him/herself as lacking sufficient resources to cope with this threat, a significant stress response will occur. Thus it is the appraisal process that plays a pivotal role in defining the stress response, rather than the stressor or the physiological changes that eventually occur (Lobel & Dunkel-Schetter, 1990).

More recently, integrated and multi-dimensional definitions of stress have been proposed. Based on their findings from structural equation modeling that examined measures of stress derived from the three main approaches (i.e., response-based, stimulus-based, appraisal-based), Lobel & Dunkel-Schetter (1990) defined stress as a multidimensional construct with perceptual and emotional components representing a distinct factor relative to environmental components. Consistent with these findings, Cohen and colleagues defined stress as "a process in which environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease (Cohen, Kessler, & Gordon, 1997, p. 3). What appears central to these definitions of stress is the notion that stress includes an occurrence of mental and behavioral responses that indicate strain or tension resulting from difficult circumstances.

Stress Measurement

Research studies have investigated the effects of psychological stress on a variety of factors (e.g., health outcomes, Weinberger et al., 1987; immune system functioning, Cohen, Janicki-Deverts, & Miller, 2007; work outcomes, Parker et al., 2003; depression, Monroe & Harkness, 2005), and its relationship to aggression in particular has been a subject of interest since the 1930s (Dollard et al., 1939). The measures used to evaluate levels of stress vary from study to study. Several studies have used self-report measures that can take numerous forms: checklists of major life events (e.g., Holmes & Rahe, 1967), daily recordings of minor hassles (e.g., Eckenrode & Bolger, 1995), measures of perceived stress (e.g., Cohen, Kamarck, & Mermelstein, 1983), and measures of negative affect (e.g., McNair, Lorr, & Droppelman, 1971). Although meaningful correlations have been found between stress measured using self-report instruments and behavioral outcomes, the measurement of stress using checklists or measures of perceived stress can be problematic. Checklists can contain items that are not appropriate for the population of interest, and some checklists weight major life events in a manner that does not take into account individual differences in the perceived impact of stressful events (Cohen, 2000). Measures of perceived stress can also be influenced by additional factors such as coping skills, age, and impulsivity (Mooney et al., 2008; Tewksbury & Zgoba, 2010).

An alternative method of measuring stress is using clinician-ratings. Personal interview measures have been created that elicit information about stressful life events (e.g., Brown & Harris, 1978). These measures probe for information about various domains of functioning that can lead to stress and assign a weight for the amount of stress likely caused by the event. For example, the Daily Inventory of Stressful Events (Almeida, Wethington, & Kessler, 2002) presents a hybrid approach that queries respondent exposure to significant life events and

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respondent's appraisal of the severity of the incidents, while integrating investigator ratings to assess the severity of respondent's exposure to stressors (Almeida, Stawski, & Cichy, 2011). Other clinician-rated instruments measure stress reactions to specific life events (e.g., Weiss, Horowitz & Wilner, 1984). These clinician-rated measures can provide useful information about stress reactions and experienced stress that is less biased by personality, age, or other features of the individual of interest.

Another category of stress measurement involves psychophysiological laboratory procedures. Laboratory stress paradigms frequently involve baseline measurements of physiological phenomena, followed by presentation of a stressful stimulus, measurement of the same physiological phenomena, and conclude with a period of recovery after which physiological measurements may again be taken (Gerin, 2011). Physiological methods of examining stress can take a variety of forms such as cardiovascular measures (e.g., blood pressure, heart rate), neuroendocrine measures (e.g., catecholamine, cortisol), or neuroimaging methods (e.g., fMRI, PET scans) (Christie, Jennings, & Egizio, 2011; Gianaros & O'Connor, 2011; Lundberg, 2011). Methods for eliciting stress responses are also varied and include: prolonged stress tasks such as the Trier Social Stress Test (Kirschbaum, Pirke, & Hellhammer, 1993), active coping tasks (i.e., tasks wherein the participant perceives they can influence the outcome with sufficient effort, e.g., serial subtraction), passive coping tasks (i.e., tasks wherein the participant perceives his/her abilities will have no influence on the outcome, e.g., viewing a disturbing film), provocation of negative emotions (e.g., anger-recall task), social interaction tasks (e.g., public speaking), and exposure to aversive environmental stimuli such as cold (Gerin, 2011). Psychophysiological laboratory procedures are designed to evaluate the effect of stress on physiological functioning in order to understand the influence of stress on disease (Gerin, 2011).

Stress Research with Offenders

Of particular interest to the present study is the conceptualization of stress and measures of stress used in research with forensic populations. Few studies exist that examine stress and related constructs in offender populations. Available studies that do examine stress with forensic populations have generally relied on appraisal-based definitions of stress reflected in their use of self-report measures that require offenders to rate their level of perceived stress in response to various situations or domains of functioning. Glass and Bieber (1997) examined a specific type of stress, acculturative stress, and its effects on incarcerated Alaska native and non-native men. Glass and Bieber (1997) conceptualized acculturative stress as stress experienced in response to acculturation and social, familial, and environmental conditions as well as stress experienced in response to perceived discrimination. Acculturative stress was measured using a modified version of the Padilla SAFE (FASE) Acculturative Stress Measure (Padilla et al., 1985), which is a self-report inventory that asks respondents to rate the degree of stress experienced in response to various situations (Glass & Bieber, 1997).

Glass & Bieber (1997), along with several other researchers (e.g., Gurley & Satcher, 2003; Mooney et al., 2008; Tewksbury & Zgoba, 2010), have also examined the effects of global stress in offender populations. The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) or the four-item Perceived Stress Scale (Hewitt, Flett, & Mosher, 1992) have most commonly been used to assess global levels of stress experienced by respondents in research with offender populations (Glass & Bieber, 1997; Mooney et al., 2008; Tewksbury & Zgoba, 2010). The PSS is a self-report measure designed for use with community samples and has normative data based on a sample of the general population (Cohen, 1994) and college populations (Roberti, Harrington, & Storch, 2006). Although stress as measured by the PSS has

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been found to correlate with drug use in women, interpersonal violence in men, and poorer coping strategies in male sex offenders (Glass & Bieber, 1997; Mooney et al., 2008; Tewksbury & Zgoba, 2010), these findings are limited because the validity of the PSS as a measure of stress has not been established with forensic populations.

One study was found that used a self-report measure of stress developed for use with forensic populations. Gurley and Satcher (2003) examined the relationship between stress and substance use relapse or abstinence in a sample of criminal offenders on federal probation. The authors used the Stress in My Life Survey (Gurley & Satcher, 2003), a self-report measure that requires participants to rate their level of perceived stress in five domains: family, financial, employment, peer, and social stress. The Stress in My Life Survey was created for use with criminal populations and contains items related to stress associated with having a criminal history and current involvement with the criminal justice system. Gurley and Satcher (2003) found that substance use relapse in offenders was associated with higher levels of perceived stress.

It is important that measures of stress are validated on offender populations because significant differences can exist in the types of stressors faced by individuals within the criminal justice system compared to individuals not involved in the criminal justice system (e.g., stress related to interactions with court personnel). Furthermore, individuals within the criminal justice system often have thinking patterns that differ from the general population (Zastrow & Kirst-Ashman, 2010), which might contribute to differences in their experience of stressors. The Stress in My Life Survey was the only measure identified in the literature that was designed to measure stress with forensic populations, and it has not been extensively used. Although the Stress in My Life Survey might be a viable option for measuring stress in offender populations, the available

psychometric data is limited. There may also be concerns with the self-report nature of the

instrument. For instance, offenders might not be able to accurately recall, and reflect on, stressful

experiences (Gurley & Satcher, 2003). Clinician-rated measures and psychophysiological

methods have not been extensively used with forensic populations, but they might offer more

objective methods of measuring stress. Because of the limitations in existing measures of stress

regarding their applicability to forensic populations and limited psychometric support, one aim

of this study was to conceptualize a stress measure using items directly relevant to an offender

population derived from existing inventories.

<center>Person Factors and Aggression</center>

One important person factor is how people cope with stressful or frustrating situations.

Since 1971, there has been an emphasis on social problem solving as an important variable that

mediates person-environment interactions (D'Zurilla & Goldfried, 1971). Social problem solving

has been defined as the process of solving problems as they arise in "real world" settings

(D'Zurilla, Nezu, & Maydeu-Olivares, 2004). In order to fully understand this concept it is

important to understand the elements that make up social problem solving. The term "social"

does not necessarily refer to interpersonal transactions. Rather, it is meant as a reference to

problems that effect an individual's adaptive functioning in natural social contexts, whether they

relate to interpersonal relations or not (D'Zurilla et al., 2004). Problems have been defined as

"any life situation or task (present or anticipated) that demands a response for adaptive

functioning but no effective response is immediately apparent or available…" (D'Zurilla et al.,

2004, p. 12). A solution is considered to be a "situation-specific coping response or response

pattern (cognitive or behavioral) that is the product or outcome of the problem-solving process

when it is applied to a specific problematic situation" (D'Zurilla et al., 2004, p. 13). An *effective*

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solution is a solution that allows the individual to reach his or her problem-solving goal while simultaneously minimizing negative outcomes and maximizing positive outcomes (D'Zurilla et al., 2004). The entire problem-solving process has been conceptualized as a "self-directed cognitive-behavioral process by which an individual, couple, or group attempts to identify or discover effective solutions for specific problems encountered in daily living" (D'Zurilla et al., 2004, p. 12). This social problem-solving model was first formally presented by D'Zurilla and Goldfried in 1971, and was subsequently revised and elaborated by D'Zurilla, Nezu and Maydeu-Olivares (2002, D'Zurilla, 1986; D'Zurilla & Nezu, 1982, 1990, 1999; Maydeu-Olivares & D'Zurilla, 1995, 1996; Nezu & D'Zurilla, 1989).

Since the 1980s, theories regarding the development of aggression have included the potential influence of biased social-cognitive information processes (Keltikangas-Järvinen, 2005). In this context, aggression is viewed as a dysfunctional means of solving problems (Keltikangas-Järvinen, 2005). These theories suggest that individuals engage in aggressive responses because they have learned maladaptive problem solving tactics through observing the behavior of others (e.g., parents, peers), reinforcement, and personal experiences (Keltikangas-Järvinen, 2005). Extensive research has been conducted on the problem solving strategies of children and adolescents and the findings suggest children and adolescents who engage in aggressive behavior exhibit deficiencies in their problem solving strategies (Keltikangas-Järvinen, 2005). Specifically, studies have found children and adolescents who exhibit aggressive behaviors are more likely to misperceive others' intentions and evidence a hostile interpretation bias, generate few alternative solutions and evaluate their solutions inadequately, and select inappropriate solutions that are not effective and not prosocial (Lochman & Dodge, 1994; Quiggle, Garber, Panak, & Dodge, 1992, Richard & Dodge, 1982, Slaby & Guerra, 1988).

Aggressive children and adolescents are believed to hold more aggressive problem solving strategies than non-aggressive children, and studies suggest aggressive children are less able to generate appropriate alternative solutions to conflict than non-aggressive children (Keltikangas-Järvinen & Kangas, 1988).

Although many research studies involve children and adolescents, social problem solving skills have important implications for the adaptive functioning of adults as well. Problem solving skills are believed to be a protective factor against psychological distress as they provide an effective coping strategy with which to address negative events (Nezu, Wilkins, & Nezu, 2004). Effective problem solving skills have been found to moderate the relationship between stress and distress, such that individuals with poorer problem solving skills experience more distress in response to stressful events than individuals with more advanced problem solving skills experiencing similar stressful events (Nezu et al., 2004).

Social problem solving skills have been implicated in aggression in studies with adults. Studies have found a significant relationship between problem solving skills and aggression in college students, wherein individuals with poorer problem solving skills are more likely to be aggressive (McMurran, Blair, & Egan, 2002; Ramadan & McMurran, 2005). Ramadan and McMurran (2005) found that problem solving skills mediated the relationship between impulsiveness and aggression, suggesting that impulsive individuals were more likely to be aggressive only if they also possessed poor problem solving skills. Problem solving skills have also been identified as a mediator in the relationship between self-esteem and aggression. In a sample of college students, D'Zurilla, Chang, and Sanna (2003) found that the relationship between self-esteem and anger was mediated by negative problem orientation (one dimension of social problem solving), and the relationship between self-esteem and hostility was partially

mediated by negative problem orientation. D'Zurilla and colleagues (2003) found significant, negative relationships between all dimensions of social problem solving and hostility in this sample. Their results also suggested that holding a negative problem orientation was related to anger, and possessing an impulsive/careless style was related to anger and physical aggression. Hellmuth and McNulty (2005) used a longitudinal design to examine the relationship between problem solving, stress, neuroticism and intimate partner violence (IPV). They found problem solving deficits and stress at the beginning of marriage independently predicted intimate partner violence (IPV) during the first four years of marriage. Their results also indicated that problem solving and stress moderated the relationship between neuroticism and IPV, such that neuroticism predicted IPV more strongly when the individual also possessed poor problem solving skills and experienced high levels of stress (Hellmuth & McNulty, 2005).

Social problem solving skills have also been investigated in offender populations. Research suggests social processing skills deficits are related to criminal behavior in adults (Antonowicz & Ross, 2005). Ross and Fabiano (1985) completed a review of existing research evidence and found support for the relationship between poor problem solving skills and aggression in adults (as cited in Antonowicz & Ross, 2005). Similar to the findings of Hellmuth and McNulty (2005), McMurran, Egan, Blair and Richardson (2001) found that problem solving skills mediated the relationship between neuroticism and criminal behavior in a sample of mentally disordered offenders. Nezu and colleagues (2005) found that the negative problem orientation, impulsivity/careless style, and avoidance style components of the social problem-solving model correlate with sexual offending in child molesters (Nezu, Nezu, Dudek, Peacock & Stoll, 2005).

An Analysis of Person and Situation Factors Predicting Aggression

The GAM suggests that individuals may behave in an aggressive manner in response to an experienced frustration. Social problem solving literature suggests an aggressive response will be more likely if the individual has poor problem solving. Poor problem solving is hypothesized to result from the failure to implement problem solving skills due to lack of motivation or deficits in problem solving skills (McGuire, 2005). Because problem solving is regarded as a skill that can be learned through direction, guided practice, and repetition (McGuire, 2005), it is a skill that can be taught using therapeutic techniques. The underlying assumption is that if individuals are taught how to effectively address their problems, they will experience less stress and frustration, and in turn they will be less likely to engage in aggressive behavior. This study evaluated these proposed relationships with an anger management population.

Hypotheses

The aim of this study was to evaluate whether proposed relationships within the GAM could be supported in a sample of violent offenders enrolled in a violence reduction training program (VRTP) at a Midwestern University. Specifically, this study sought to examine the influence of reported stress, which represents an interaction between person and situation factors, and social problem solving, which represents a person factor, on aggression. One purpose of the current study was to develop measures of emotional stress designed specifically for assessing adults with anger control problems from culling items from existing clinician-rated and self-report questionnaires. It was hypothesized that factor analysis would reveal two separate, but related dimensions of stress – self-reported and clinician-rated.

The second purpose of the current study was to use the newly developed stress scales to examine the relationship between social problem solving skills, stress, and aggressive behavior

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in a violent offender population. It was hypothesized that stress, represented by the latent stress variables created in part one of this study, would significantly predict aggression at time one and re-offense at time two such that individuals with higher levels of stress would be more likely to have engaged in aggressive behavior. Additionally, it was hypothesized that social problem solving ability would significantly mediate the relationship between stress and aggression such that individuals with higher levels of social problem solving ability would be less likely to behave aggressively regardless of their stress levels.

CHAPTER II

METHOD

Participants

The current study used archival data from individuals who attended a violence reduction training program (VRTP) at a Midwestern University between 2002 and 2009. VRTP is a manualized, group anger management treatment program that incorporates many of the components identified by the GAM as necessary for the treatment of aggressive behavior. These include self-monitoring to increase awareness of affective states and aggression-related thoughts, relaxation training to decrease arousal, and social problem solving skills training to strengthen self-regulatory abilities and enhance the decision-making process (DeWall et al., 2011). One goal is to enable individuals to more effectively cope with subsequent frustrating experiences, thus reducing their likelihood of future aggression.

Data from a sample of 224 individuals (151 males, 73 females) were used for analyses. Participants ranged in age from 17 to 74 ($M = 28$). The majority of participants were Caucasian (75.9%), followed by African American (7.1%), Hispanic/Latino (4.5%), Native American (3.6%), and Asian (0.9%). Information about ethnicity was missing for 17 participants. Most of the participants were court-ordered to treatment ($n = 198$), rather than self-referred ($n = 25$). Referral information was missing for one participant.

Measures

Aggression Questionnaire (AQ)

The Aggression Questionnaire (Buss & Perry, 1992) is a 29-item self-report measure of aggression and related behaviors. It has four subscales that measure anger, hostility, verbal

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aggression, and physical aggression. Participants rate on a 5-point Likert-style scale the degree to which each item is characteristic of them or their behavior (1 = least like me, 5 = extremely like me). The Aggression Questionnaire has demonstrated acceptable internal consistency (scale alphas ranging from .72 to .85; overall alpha .89) and test-retest reliability (Buss & Perry, 1992). Items from the Aggression Questionnaire were used in the construction of the self-report measure of stress.

Demographic Questionnaire

The demographic questionnaire was created for use in VRTP. It contains questions related to basic demographic information (i.e., age, ethnicity, gender, and education level) and current stressors (i.e., physical health, relationship quality, and additional concerns). It also contains questions related to reason for referral and history of mental health treatment. Items from the demographic questionnaire were used in the construction of the self-report measure of stress.

Historical-Clinical-Risk Assessment (HCR-20)

The HCR-20 (Webster, Douglas, Eaves, & Hart, 1997) is a semi-structured interview designed to assess the risk of future violence in forensic populations. The interview is divided into three categories that have been found to be predictive of future violence: historical items, clinical items, and risk items. The historical category contains items pertaining to static risk factors including age at first violent offense, employment problems, early maladjustment, and prior supervision failure. The clinical category contains items relating to dynamic and static risk factors including the individual's level of insight, antisocial attitudes, present psychopathology, and impulsivity. The risk category contains items related to dynamic risk factors including

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present de-stabilizers, level of personal support, treatment compliance, and stress. Clinician's rate each item using a 3-point scale that ranges from 0 (the item definitely is absent or does not apply) to 2 (the item definitely is present).

The HCR-20 has been found to have acceptable internal consistency and interrater reliability (Douglas, 2004). The construct validity of the HCR-20 has been well established. The HCR-20 significantly correlates with other actuarial measures of violence including the Violence Risk Appraisal Guide and the Hare Psychopathy Checklist – Revised, and has been found to significantly predict future violent behavior and readmission to psychiatric facilities (Douglas & Webster, 1999; Gray, Taylor, & Snowden, 2008). Items from the HCR-20 were used to create the clinician-rated measure of stress. Additionally, one item from the HCR-20 (Item one: History/Previous Level of Violence) was used in mediation analyses as an approximate measure of violence prior to treatment.

Marlowe-Crowne Social Desirability Scale

The Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960) is a 33-item self-report inventory designed to assess an individual's tendency to present him/herself in an overly favorable manner. The MCSDS has been widely used in clinical and research settings as a method to control for effects of socially desirable responding (Beretvas, Meyers, & Leite, 2002), and has been found to have acceptable psychometric properties with student samples and forensic populations (Crowne & Marlowe, 1960; Tatman, Swogger, Love, & Cook, 2009). The MCSDS was administered to participants during the first treatment session, and scores on the MCSDS were used in meditational analyses to control for positive response biases in the self-report measures.

Social Problem Solving Inventory – Revised

The Social Problem Solving Inventory-Revised Short Form (SPSI-R; D'Zurilla et al., 2002) is a 25-item, self-report inventory that measures perceived social problem solving ability. D'Zurilla and colleagues conceptualized social problem solving as a multidimensional construct (D'Zurilla et al., 2004). Social problem solving was initially thought to consist of two components: problem orientation and problem solving skills. Problem orientation referred to the individual's meta-cognitive beliefs regarding problem solving, which included an individual's attitudes towards solving problems and his or her confidence in his or her ability to problem solve (D'Zurilla et al., 2004). The problem orientation component was believed to serve a motivational purpose in problem solving (D'Zurilla et al., 2004). Problem solving skills referred to the behavioral and cognitive activities individuals used to understand and find solutions for their problems (D'Zurilla et al., 2004). Specific skills were identified including problem and goal definition, generation of alternatives, decision making, and solution implementation and verification (D'Zurilla et al., 2004). These components have been retained in the five-step problem-solving model often used in treatment settings; however, the conceptualization of social problem solving has been altered through subsequent research.

The Social Problem Solving Inventory (SPSI; D'Zurilla & Nezu, 1990) was created to measure social problem solving and the two primary components that were believed to comprise this construct. Factor analysis of the SPSI indicated a five-factor model fit the data better than the two-factor model initially hypothesized (D'Zurilla et al., 2004). Based on these results, the social problem-solving model was revised and the construct was re-conceptualized as consisting of five separate but related components: two types of problem orientation (positive and negative) and three types of problem solving styles (rational, impulsive/careless, avoidant) (D'Zurilla et

al., 2004). The SPSI-R and SPSI-R short form (D'Zurilla et al., 2002) were created to provide a more accurate assessment of these five factors.

The SPSI-R and SPSI-R short form are process measures that examine individuals' typical responses to problems and their attitudes towards addressing such issues (McGuire, 2005). Participants respond to items using a 5-point Likert-style scale with scores ranging from 0 (not at all true of me) to 4 (extremely true of me). The SPSI-R and SPSI-R short form have five scales: positive problem orientation, negative problem orientation, rational problem solving, impulsivity/carelessness style, and avoidance style. Individuals that score higher on the positive problem orientation (PPO) scale are likely to hold constructive, positive attitudes towards solving problems such as viewing problems as a challenge rather than a threat. Individuals who score higher on the PPO scale are likely to be optimistic that problems can be resolved, have confidence in their ability to solve problems, are patient when solving problems, and are committed to problem solving rather than engaging in avoidant behaviors (D'Zurilla, et al., 2003). The negative problem orientation (NPO) scale represents a dysfunctional orientation towards social problem solving. Individuals that score higher on the negative problem orientation scale are more likely to view problems as a threat, lack confidence in their ability to successfully devise and implement a solution to a problem, and respond to problems with frustration (D'Zurilla et al., 2003). The rational problem solving (RPS) scale is a measure of one's knowledge and ability to apply constructive problem solving skills. Individuals who score higher on this scale are more likely to engage in effective problem solving practices similar to those outlined in the 5-step problem-solving model by D'Zurilla and Nezu (1999). This model includes problem orientation (awareness that one is experiencing a problem), problem and goal definition (i.e., gathering information, identifying possible obstacles, realistically defining goals and

solutions), generation of alternatives, decision making regarding alternate solutions, and finally selecting and implementing a solution and evaluating the outcome (D'Zurilla et al., 2003; D'Zurilla & Nezu, 1999). Individuals that score higher on the impulsivity/carelessness (ICS) scale often have narrow, impulsive, careless, hurried and/or incomplete problem solving behavior (D'Zurilla & Maydeu-Olivares, 1995), which negatively affects their ability to implement problem solving skills. The avoidance style (AS) scale is also designed to reveal a problematic problem solving orientation; the orientation is characterized by avoidance, inaction, and reliance on others to solve problems (D'Zurilla et al., 2003; D'Zurilla & Maydeu-Olivares, 1995).

The SPSI-R short form has been found to highly correlate with the SPSI-R (D'Zurilla et al., 2002). Both measures have demonstrated acceptable internal consistency in samples of college students (D'Zurilla et al., 2002; D'Zurilla et al., 2003; Hawkins, Sofronoff, & Sheffield, 2009) and forensic samples (Lindsay, Hamilton, Moulton, Scott, Doyle, & McMurran, 2011; Wakeling, 2007). The SPSI-R and SPSI-R short form have been found to significantly correlate with conceptually related factors including depression, anxiety, hopelessness, self-esteem, locus of control, impulsivity, and facets of aggression (e.g., anger, hostility, physical aggression) (D'Zurilla et al., 2002; D'Zurilla et al., 2003; Ramadan & McMurran, 2005; Wakeling, 2007). The SPSI-R short form was used to provide a measure of problem solving skills in the VRTP sample.

Procedure

The first part of this study involved creating measures of stress derived from clinician-rated and self-reported items that were completed at the beginning of treatment for each VRTP participant. Psychology graduate students administered HCR-20 interviews to participants individually prior to the start of the treatment program. VRTP participants completed the demographic questionnaire and various measures of aggression and problem solving (including the Aggression Questionnaire and the SPSI-R short form) during the first treatment session. Two graduate students familiar with the aggression literature conducted content analyses of the Aggression Questionnaire, demographic questionnaire, and HCR-20 and selected items that were conceptually related to stress. A broad definition of stress, similar to the multidimensional conceptualization put forth by Cohen and colleagues (1997), was used to select items that referred to perceived stress or the presence of a stressor. The following definition of stress was given to the graduate raters to guide their selection of items, "[stress is] a state of mental or emotional strain or tension resulting from adverse or very demanding circumstances" (Apple Inc., 2007).

Data Analysis

The initial dataset of 224 participants was split into two separate datasets for analyses. Data from 112 participants were used for exploratory factor analyses (EFA), and data from the remaining 112 participants were used for confirmatory factor analyses (CFA). EFA was used to determine if an underlying stress variable(s) could be identified from the clinician-rated and self-reported items selected during the content analyses. The items were analyzed using principal axis

factoring (PAF). In PAF, the first factor derived accounts for the greatest amount of shared variance, the second factor derived accounts for the greatest amount of shared variance after the influence of the first factor has been removed, and so on (Pett, Lackey & Sullivan, 2003). The Kaiser-Guttman rule was used to determine the initial number of factors to be extracted. This rule states that a factor should be extracted if the eigenvalue (i.e., the amount of variance of the total variables accounted for by the factor) is greater than or equal to 1 (Pett et al., 2003). The scree plot was also examined to determine the number of factors to be extracted, because reliance on the Kaiser-Guttman rule alone can result in over factoring (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Additionally, parallel analysis was performed to further examine the number of factors to be extracted. Parallel analysis involves generating random datasets with the same sample size and number of items as the real dataset, and then comparing eigenvalues from the random dataset to the real dataset. It is recommended that factors be extracted from the real dataset only if they explain more variance than corresponding factors in the random dataset (Fabrigar et al., 1999).

Oblimin rotation, a unique form of oblique rotation that is used when it is expected that factors will be correlated (Pett et al., 2003), was then used to aid in the interpretation of factors. This form of rotation was chosen because it was hypothesized that if two or more factors were derived they would be correlated and related to different facets of stress. Factor loadings were examined to determine the factor structure of the scales and to refine scale content. It has been recommended that each item have a minimum loading of .30 to .35 in order to be retained on any factor (Spector, 1992), and this criterion was used.

Reliability analyses were performed to aid in further refining the scales' content. Cronbach's (1951) coefficient alpha was calculated to evaluate the internal consistency of each

scale. A minimum alpha coefficient of .70 is generally required in order to consider a scale to possess acceptable levels of internal consistency reliability (Nunnally, 1978), although alphas in the .80 to .90 range are desirable (DeVellis, 2003). Corrected item-total correlations (CITCs) were examined and items with low CITCs ($< .50$; DeVellis, 2003) were considered for removal.

Confirmatory factor analyses were then performed on the scales to confirm the factor structures in an independent sample of 112 participants. One-factor and two-factor solutions were examined to evaluate the more appropriate model fit. CFA was chosen for this purpose because it is designed to test specific hypotheses regarding factor structures (Spector, 1992). CFA involves specifying a hypothesized factor structure and then evaluating how well data fit the model (Spector, 1992). The assessment of overall model fit was examined using several statistical tests including the chi-square goodness-of-fit statistic, comparative fit index (CFI; Bentler, 1990), and root mean square error of approximation (RMSEA; Browne & Cudeck, 1993).

In order to obtain factor scores to be used in subsequent mediation analyses (see Phase Two), an exploratory factor analysis incorporating items selected through previous EFA and CFA procedures was performed on all data ($N = 224$) restricting the model to two factors. Maximum likelihood extraction with direct oblimin rotation was used in factor extraction because this is the method used in CFA and most closely approximated the results found in the original CFA analysis. Bartlett's factor scores were derived and used to represent the latent stress variables in subsequent analyses.

Procedure

The second part of this study involved examining the stress scales' ability to predict

aggression at two time points, and evaluating the influence of problem solving as a mediating

variable. Re-offense data were collected for the 224 participants used in part one of this study.

Because the re-offense data were intended to represent subsequent acts of aggression, only

offenses of a violent nature were included (Table 1).

Table 1. *Categorization of Offenses*

Violent Offenses	Non-Violent Offenses
Aggravated Assault	Breaking and Entering
Assault and Battery	Disturbing the Peace
Assault with a Dangerous Weapon	Delivery of Controlled Substance
Assault with Intent to do Great Bodily Harm	Embezzlement
Assault with Intent to Commit Murder	Fraud
Criminal Sexual Conduct (1st or 2nd degree)	Indecent Exposure
Domestic Violence	Interfering with Electronic Communications
Home Invasion	Joyriding
Property Destruction	Larceny
Resisting/Obstructing a Police Officer	Manufacture of Controlled Substance
Stalking	Non-Sufficient Funds
	Operating While Intoxicated
	Operating While Visibly Intoxicated
	Possession of Controlled Substance

Data Analysis

Two models were constructed. The first model included the latent stress variables, SPSI-

R short form scores at pre-treatment, and history of aggressive behavior (as assessed by HCR-20

Item one: History/Previous Level of Violence). The second model included the latent stress

variables, SPSI-R short form scores at post-treatment, and number of violent re-offenses. The

second model was examined for treatment completers only. There were too few treatment non-completers with sufficient data ($n = 32$) to perform separate mediation analyses.

Preacher and Hayes' (2008) bootstrapping method was used to examine the relationship between frustration (represented by the latent stress variables), aggression, and social problem solving. This process was completed for each stress variable independently. The Preacher and Hayes (2008) method of testing for mediation effects uses a bootstrapping procedure. This approach does not assume normal distribution in the sample, and is therefore less prone to Type I errors than the Baron and Kenny (1986) mediational model or Sobel's test (Sobel, 1982). Bootstrapping is a nonparametric re-sampling procedure that involves sampling n cases with replacement from the original sample (Preacher & Hayes, 2008). The total and specific indirect effects of X on Y are estimated in each replication, and this process in repeated k times ($k \geq$ 1000). This allows for an empirical approximation of the sampling distribution of indirect effects. Confidence intervals are derived from the k estimates, and are examined to determine if mediation occurred.

CHAPTER III

RESULTS

Part One

Preliminary Analyses

Twenty-five items identified through content analyses were selected for inclusion in

preliminary analyses (Table 2). The data were examined to determine if they met the

assumptions necessary to perform exploratory factor analysis (EFA) and confirmatory factor

analysis (CFA). EFA and CFA both require that data are normally distributed, highly

intercorrelated, and have five times as many participants as variables (Fabrigar et al., 1999;

Gorsuch, 1983). Item frequencies and histograms were examined to inspect the distribution of

items. One item (AQ13) was significantly skewed (skew > 2.0; West, Finch, & Curran, 1995)

and therefore was removed from further analyses. Visual inspection identified several other

items that were moderately skewed, but they were included in further analyses as the

distributions were not substantially non-normal and factor analysis is robust to minor violations

of the normality assumption (West et al., 1995).

Table 2. *Items Used in Preliminary Analyses*

Measure	Item Content	Abbreviation
Aggression	I flare up quickly but get over it quickly	AQ3
Questionnaire	I am sometimes eaten up with jealousy	AQ4
	I often find myself disagreeing with people	AQ6
	At times, I feel like I have gotten a raw deal out of life	AQ8
	I sometimes feel like a powder keg ready to explode	AQ11
	Other people always seem to get the breaks	AQ12
	I get into fights a little more than the average person**	AQ13
	I am an even-tempered person*	AQ15
	I wonder why sometimes I feel so bitter about things	AQ16
	I know that "friends" talk about me behind my back	AQ20

Table 2. *Items Used in Preliminary Analyses(continued)*

Measure	Item Content	Abbreviation
Aggression Questionnaire	Sometimes I fly off the handle for no good reason	AQ22
	I have trouble controlling my temper	AQ25
	I sometimes feel that people are laughing behind my back	AQ26
Demographic Questionnaire	Rate your relationship with your current spouse or mate*	Relationship
	I would rate my physical health as*	Health
	Number of Additional Concerns (e.g., financial problems)	Add_concerns
HCR-20	Relationship Instability	HCR3
	Employment Problems	HCR4
	Substance Use Problems	HCR5
	Major Mental Illness	HCR6
	Personality Disorder	HCR9
	Exposure to De-Stabilizers	HCR12
	Lack of Personal Support	HCR13
	Stress	HCR15
	Active Symptoms of Major Mental Illness	HCR18

Notes. *Indicates item is reverse coded. For all items, higher numbers indicate greater amounts of stress. **Indicates item was eliminated because it did not meet preconditions for factor analysis.

The remaining 24 items suggested the need for a sample size of 120. The sample used for EFA was 112. Although this did not meet the minimum 5:1 ratio recommended by some (e.g., Gorsuch, 1983), others have stated that this ratio may not be necessary because sample size requirements are influenced by the degree of over-determination of the factors and communalities of the measured variables (Fabrigar et al., 1999). The factors were over-determined in the EFA, and the general minimum requirement of at least 100 participants was met (Fabrigar et al., 1999).

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was examined on the initial stress items to evaluate the homogeneity among variables. The KMO was .69, which is acceptable but less than ideal (Pett et al., 2003). Bartlett's Test of Sphericity was examined to

evaluate whether the variables were significantly correlated. The results indicated the variables were significantly correlated, Bartlett's Test of Sphericity $\chi^2(276, n = 112) = 676.06, p < .01$.

Exploratory Factor Analyses

The 24 items (Table 2, p. 35) were analyzed using principal axis factoring (PAF) with direct oblimin rotation. The Kaiser-Guttman rule supported extraction of six factors that accounted for 61.9% of the shared variance. The scree plot and parallel analysis both suggested that up to three factors could be extracted. Visual inspection of the rotated matrix suggested that most self-reported items loaded highly on the first factor, whereas the clinician-rated items were spread throughout the remaining six factors. Conceptually it was most logical to attempt to extract two factors and to determine if they represented self-reported and clinician-rated items. Therefore, PAF was performed again restricting the model to two factors. The Kaiser-Guttman rule supported extraction of two factors that accounted for 42.1% of the shared variance. This was also supported by the scree plot and parallel analysis. The first factor contained self-reported items and accounted for 30.4% of the shared variance. The second factor contained clinician-rated items and accounted for the remaining 11.6% of the shared variance.

Factor loadings were examined to identify items that did not load substantially on the factors and/or lacked face validity in order to refine the scales. Using the criterion of a rotated factor loading .50 or higher (DeVellis, 2003), there were nine self-reported items retained on factor one, and there were eight clinician-rated items retained on factor two (Table 3). The health variable loaded most highly on the factor containing clinician-rated items; however, it was a self-reported item and did not fit conceptually with this scale and was therefore removed.

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Table 3. *Rotated Factor Loadings*

Item	Factor Loading	
	Factor 1	**Factor 2**
AQ3	.46	-.09
AQ4	**.67**	.14
AQ6	**.59**	-.01
AQ8	**.73**	-.05
AQ11	**.85**	.00
AQ12	**.54**	-.15
AQ15	.30	.16
AQ16	**.74**	.14
AQ20	.41	-.02
AQ22	**.77**	.06
AQ25	**.88**	-.08
AQ26	.48	.27
Relationship	.31	.11
Health*	.03	**.65**
Add_Concerns	**.60**	.32
HCR3	.10	**.51**
HCR4	.08	**.63**
HCR5	-.25	**.51**
HCR6	.20	**.59**
HCR9	.21	**.71**
HCR12	-.15	**.79**
HCR13	-.07	**.59**
HCR15	.17	**.64**
HCR18	.23	.43

Notes. Loadings in bold are values above .50. *Item selected for removal because it lacked face validity.

Reliability analyses were performed separately for the two factors to examine corrected item-total correlations (CITCs) for each item and further refine the scales' contents. Items with low CITCs were considered for removal. The first factor, herein referred to as the self-reported stress scale, contained nine items. Internal consistency reliability analysis was performed and indicated adequate internal consistency, $\alpha = .73$ for the initial nine items. The CITCs were relatively high (> .40); however, results suggested that removal of the item "additional concerns" would increase internal consistency (Table 4). This item was removed and internal consistency analyses were re-run. Cronbach's alpha = .90 with eight items, and CITCs were high (> .50).

However, results suggested that removal of the item "AQ6" would not reduce internal consistency. In an attempt to make the scale as parsimonious as possible, this item was removed and reliability analyses were re-run. This resulted in α = .90 with seven items.

Table 4. *Reliability Analyses for Self-Reported Stress Scale*

Item	Corrected Item-Total Correlation		
	First Analysis	**Second Analysis**	**Third Analysis**
Add_Concerns*	.55	--	--
AQ4	.68	.70	.68
AQ6*	.44	.53	--
AQ8	.63	.70	.70
AQ11	.72	.81	.82
AQ12	.51	.63	.61
AQ16	.69	.68	.68
AQ22	.68	.71	.72
AQ25	.72	.73	.75

Notes. n = 109 after excluding cases with missing data. *Items selected for removal.

The second factor, herein referred to as the clinician-rated stress scale, contained eight items. Internal consistency reliability analysis was performed and indicated adequate internal consistency, α = .79 for the initial eight items. Examination of CITCs suggested that the item "HCR5" should be removed in order to improve internal consistency (Table 5). This item was removed and internal consistency analyses were re-run. Cronbach's alpha = .80 with seven items, and CITCs were high (> .40). All remaining items were retained in order to maximize internal consistency.

Table 5. *Reliability Analyses for Clinician-Rated Stress Scale*

Item	Corrected Item-Total Correlation	
	First Analysis	**Second Analysis**
HCR3	.49	.45
HCR4	.54	.50
HCR5*	.24	--
HCR6	.46	.49
HCR9	.57	.62
HCR12	.65	.64
HCR13	.49	.50
HCR15	.52	.56

Notes. $n = 90$ after excluding cases with missing data. *Item selected for removal.

Confirmatory Factor Analyses

Confirmatory factor analysis was performed on an independent sample of 112 subjects in order to confirm the factor structures of the scales identified through exploratory factor analysis. One and two-factor models were tested to determine the most adequate model fit. Items included in the confirmatory factor analysis consisted of the final seven items selected for inclusion in the self-reported stress scale, and the final seven items selected for inclusion in the clinician-rated stress scale.

The results suggested a two-factor solution provided an acceptable model fit for the data (see Table 6). As seen in figure 1, the items were substantially related to their hypothesized latent variables. The chi-square statistic was significant, $\chi^2(76, n = 88) = 120.47$, $p < .05$; however, this is not unexpected given the large sample size. The results of other measures of model fit (i.e., RMSEA, CFI, SRMR, AIC) suggested good fit. In contrast, results of the one-factor solution suggested it did not provide an acceptable model fit (Table 6). Consistent with this finding, the comparison of the one and two-factor solutions suggested the one-factor solution significantly worsened the model fit relative to the two-factor solution, $\Delta \chi^2(1, n = 88) = 59.26$, $p < .01$.

Therefore the two-factor solution was selected as the appropriate model to represent the latent stress variables.

Table 6. *Goodness of Fit Indices for CFA Models*

Model	χ^2	df	p	RMSEA	CFI	SRMR	AIC
1	120.47	76	.00	.08	.95	.07	180.64
2	179.73	77	.00	.13	.88	.10	249.28

Notes. *n* = 88. Model 1 = two-factor solution. Model 2 = one-factor solution. RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized root mean square residual; AIC = Akaike Information Criterion.
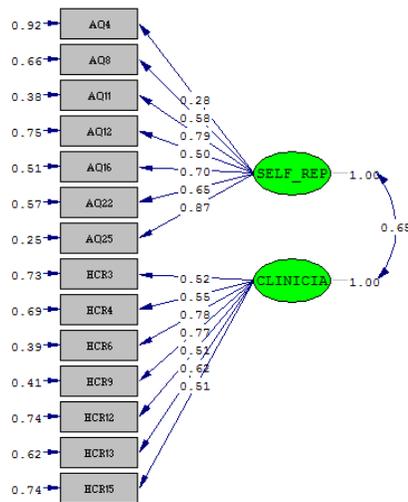
Figure 1. Path diagram of two-factor solution with standardized estimates.

Part Two

Preliminary Analyses

Descriptive statistics were used to examine scores on the problem solving measure, social desirability measure, and proxy measures for aggression (Table 7). Participants' scores on the SPSI-R short form (time 1 *M* = 67.36, time 2 *M* = 71.02) were found to be higher than reported norms (*M* = 60.48; D'Zurilla et al., 2002) and were found to significantly improve from pre to

post-treatment, $t(156) = -2.68$, $p < .01$. Participants' scores on the Marlowe-Crowne Social Desirability Scale ($M = 19.18$) were consistent with forensic norms ($M = 19.42$; Andrews & Meyer, 2003). On the item used to assess levels of aggression at time one, most participants were rated as having possible/less serious previous violence. The number of violent offenses committed by participants, which represented the proxy measure for aggression at time two, ranged from 0 to 5 with 12.95% of the entire sample violently reoffending. Among individuals who committed a subsequent violent offense, the majority of individuals (68.96%) reoffended within one year of treatment participation regardless of their treatment completion status.

Table 7. *Descriptive Statistics for Measures*

Measure	Sample Size	Mean	Standard Deviation	Range
MCSDS	221	19.18	6.19	4 to 33
SPSI-R Time One	220	67.36	17.09	5 to 100
SPSI-R Time Two	159	71.02	13.77	31 to 99
Aggressive Acts Time 1	191	1.17	0.77	0 to 2
Aggressive Acts for Reoffenders Time 2	29	2.03	1.32	1 to 5

Notes. Sample size varied between measures due to missing data. Aggressive Acts Time One was assessed by HCR-20 Item One: History/Previous Level of Violence. Aggressive Acts for Reoffenders Time Two was assessed by the number of violent offenses committed within three years of treatment completion and included only data on individuals who committed a subsequent violent offense.

Independent samples *t*-test was performed to examine differences in levels of aggression at time one between treatment completers and non-completers. The results suggested there was a significant difference in rates of aggression between treatment completers and non-completers at time one, $t(81.9) = -2.01$, $p < .05$, with treatment non-completers rated as having higher levels of aggression than treatment completers. The number of violent offenses committed within three years of treatment completion, which served as a measure of aggression at time two, was also examined between completers and non-completers. It was found that 9.43% of treatment

completers ($n = 159$) committed a violent offense within three years, whereas 21.54% of treatment non-completers ($n = 65$) committed a violent offense within three years (Table 8). The difference in 3-year recidivism rates between treatment completers and non-completers was significant, $\chi^2(1, N = 224) = 6.00, p < .05$.

Table 8. *Reoffense Rates by Treatment Completion Status*

| | **Completer** ($n = 159$) | | **Non-Completer** ($n = 65$) | |
	Cumulative %	# of Perpetrators	Cumulative %	# of Perpetrators
Year 1	6.29	10	15.38	10
Year 2	6.91	1	20.00	3
Year 3	9.43	4	21.54	1

Mediation Analyses

Four separate mediation analyses were performed to examine the relationships between stress, social problem solving skills, and aggression using Preacher and Hayes' (2008) bootstrapping method. The first two analyses included the entire sample of VRTP participants who had sufficient data, whereas the last two analyses included only treatment completers with sufficient data. The Marlowe-Crowne Social Desirability Scale (MCSDS) was entered as a control variable in all analyses to mitigate the effects of socially desirable responding on the self-report measures. The correlation matrix for the measures is depicted in Table 9.

Table 9. *Correlation Matrix for Social Problem Solving, Stress Variables, and Aggression Measures*

	SPSI-R Time 1	SPSI-R Time 2	Self-Report Stress	Clinician-Rated Stress	Aggression Time 1
SPSI-R Time 2	.57*				
Self-Report Stress	-.58*	-.19*			
Clinician-Rated Stress	-.32*	-.20*	.54*		
Aggression Time 1	-.23*	-.08	.29*	.41*	
Aggression Time 2	-.12	-.07	.11	.21*	.22*

Notes. Table shows partial correlations, controlling for social desirability with Marlowe-Crown Social Desirability Scale. *Indicates partial correlation was significant at the $p < .05$ level.

The first analysis examined whether self-reported stress could significantly predict pre-treatment levels of aggression and if this relationship was mediated by pre-treatment levels of social problem solving skills. As illustrated in Table 10, self-reported stress significantly predicted social problem solving at time one, $B = -8.98$, $t(172) = -8.93$, $p < .01$, and aggression at time one, $B = .17$, $t(172) = 2.71$, $p < .01$. Social problem solving at time one did not significantly predict aggression at time one, $B = .00$, $t(172) = -0.61$, $p = .54$, but it did attenuate the relationship between self-reported stress and aggression at time one, $B = .14$, $t(172) = 1.88$, $p = .06$. However, social problem solving was not found to be a significant mediator in this model, with a bias corrected 95% CI of -0.05 to 0.11.

Table 10. *Mediation Results: Self-Reported Stress Predicting Aggression at Time 1*

Path	Coefficient	SE	t	p
a	-8.98	1.01	-8.93	<.01
b	.00	.00	-0.61	.54
c	.17	.06	2.71	<.01
c'	.14	.07	1.88	.06

Notes. $n = 172$. SPSI-R Time 1 entered as mediator variable. Marlowe-Crowne Social Desirability Scale entered as covariate.

The second analysis examined whether clinician-rated stress could significantly predict pre-treatment levels of aggression and if this relationship was mediated by pre-treatment levels of social problem solving skills. As illustrated in Table 11, clinician-rated stress significantly predicted social problem solving at time one, $B = -2.93$, $t(172) = -2.89$, $p < .01$, and aggression at time one, $B = .24$, $t(172) = 4.79$, $p < .01$. Social problem solving at time one did not significantly predict aggression at time one, $B = .00$, $t(172) = -1.12$, $p = .27$, and it did not affect the relationship between self-reported stress and aggression at time one, $B = .23$, $t(172) = 4.44$, $p < .01$. Social problem solving was not found to be a significant mediator in this model, with a bias corrected 95% CI of -0.00 to 0.05.

Table 11. *Mediation Results: Clinician-Rated Stress Predicting Aggression at Time 1*

Path	Coefficient	SE	t	p
a	-2.93	1.01	-2.89	<.01
b	.00	.00	-1.12	.27
c	.24	.05	4.79	<.01
c'	.23	.05	4.44	<.01

Notes. $n = 172$. SPSI-R Time 1 entered as mediator variable. Marlowe-Crowne Social Desirability Scale entered as covariate.

The third analysis examined whether self-reported stress could significantly predict violent reoffense within three years of treatment completion and if this relationship was mediated by post-treatment levels of social problem solving skills. As illustrated in Table 12, self-reported stress significantly predicted social problem solving at time two, $B = -2.49$, $t(140) = -2.18$, $p < .05$. However, self-reported stress did not significantly predict 3-year violent recidivism, $B = .07$, $t(140) = 1.20$, $p = .23$. Social problem solving at time two also did not significantly predict 3-year violent recidivism, $B = .00$, $t(140) = -0.55$, $p = .58$.

Table 12. *Mediation Results: Self-Reported Stress Predicting Aggression at Time 2 for Treatment Completers*

Path	Coefficient	SE	t	p
a	-2.49	1.14	-2.18	<.05
b	.00	.00	-0.55	.58
c	.07	.06	1.20	.23
c'	.07	.06	1.08	.28

Notes. *n* = 140. SPSI-R Time 2 entered as mediator variable. Marlowe-Crowne Social Desirability Scale entered as covariate.

The final mediation analysis examined whether clinician-rated stress could significantly predict violent reoffense within three years of treatment completion and if this relationship was mediated by post-treatment levels of social problem solving skills. As illustrated in Table 13, clinician-rated stress significantly predicted social problem solving at time two, $B = -2.27$, $t(140) = -2.26$, $p < .05$, and 3-year violent recidivism, $B = .13$, $t(140) = 2.51$, $p < .05$. Social problem solving at time two did not significantly predict 3-year violent recidivism, $B = .00$, $t(140) = -0.31$, $p = .76$, and it did not affect the relationship between clinician-rated stress and aggression, $B = .13$, $t(140) = 2.39$, $p < .05$, with a bias corrected 95% CI of -.02 to .04.

Table 13. *Mediation Results: Clinician-Rated Stress Predicting Aggression at Time 2 for Treatment Completers*

Path	Coefficient	SE	t	p
a	-2.27	1.01	-2.26	<.05
b	.00	.00	-0.31	.76
c	.13	.05	2.51	<.05
c'	.13	.05	2.39	<.05

Notes. *n* = 140. SPSI-R Time 2 entered as mediator variable. Marlowe-Crowne Social Desirability Scale entered as covariate.

CHAPTER IV

DISCUSSION

The current study evaluated whether stress variables could be created from clinician-rated and self-reported items taken from existing measures designed for use with offender populations. The aim of the first part of this study was to create measures of stress that reflected stressors and stressful experiences specific to a criminal justice population. The current study also evaluated whether proposed relationships within the General Aggression Model (GAM) between reported stress (represented by the scales created in part one), social problem solving, and aggression could be supported in a sample of violent offenders enrolled in a violence reduction training program (VRTP) at a Midwestern University. In particular, the second part of this study examined whether the derived stress variables could significantly predict aggression at two points in time (pre and post treatment) and if this relationship would be mediated by social problem solving.

For part one of this study, it was hypothesized that two separate, but related, stress variables would be derived from clinician-rated and self-reported items taken from existing measures. One variable was hypothesized to represent stress as assessed by the clinician, whereas the other variable was hypothesized to represent self-reported stress. These hypotheses were confirmed. By culling items from established measures designed for use with forensic populations, a 7-item self-reported stress scale and a 7-item clinician-rated stress scale were derived that possessed acceptable internal consistency reliability and content validity. The factor structures of the scales were confirmed by confirmatory factor analysis in an independent sample, which indicated a two-factor solution with one scale containing self-reported items and one scale containing clinician-rated items best fit the data. Although further research is needed to

validate the self-reported stress scale and clinician-rated stress scale, these scales might represent novel measures for examining stress in offender populations. They contain items that are directly relevant to offenders, but they do not rely on respondent's ability to consciously recall and appraise the stressfulness of past events. The clinician-rated stress scale in particular might be advantageous for examining stress in future research, because it allows for a means of measuring stress that is not contingent on the participant's ability to engage in self-reflection.

Part two of this study involved examining the relationships between the latent stress variables, social problem solving, and aggression. Based on the General Aggression Model, it was hypothesized that the self-reported and clinician-rated stress variables would significantly predict pre-treatment levels of aggression and 3-year violent reoffense such that individuals with higher levels of stress would be more likely to have engaged in aggressive behavior. The hypotheses were supported with one exception. The self-reported and clinician-rated stress variables were able to significantly predict pre-treatment levels of aggression, and the clinician-rated stress variable was able to significantly predict 3-year violent reoffense as expected. However, the self-reported stress variable was not able to significantly predict 3-year violent reoffense.

This study also examined whether the relationship between reported stress and aggression would be mediated by social problem solving. It was hypothesized that social problem solving ability would significantly mediate the relationship between reported stress and aggression such that individuals with higher levels of social problem solving ability would be less likely to behave aggressively regardless of their stress levels. This relationship was not observed in any of the meditational models. Social problem solving was found to attenuate the relationship between self-reported stress and pre-treatment levels of aggression, but it was not a significant mediator.

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Social problem solving had no discernible effect on the relationship between reported stress and aggression in any of the other models. These findings appear to relate to the minimal correlation between social problem solving and aggression. As seen in Table 9 (p. 44), the SPSI-R post-treatment scores were not significantly correlated with aggression at pre or post-treatment, and the SPSI-R pre-treatment score was only correlated with aggression at time one.

The findings provide partial support for the General Aggression Model. The notion that reported stress, which is conceptualized as an interaction between person and situation variables, could predict aggression was supported. Individuals with higher levels of self-reported and clinician-rated stress were more likely to have higher levels of aggression at pre-treatment, and they were more likely to violently reoffend within three years of treatment completion. These findings highlight the importance of addressing stress and stress management in anger management programs. Although the measure of social problem solving used in this study was not found to mediate the relationship between reported stress and aggression, training in social problem solving and other stress management strategies might still play a crucial role in successful anger management programs. One of the main focuses of VRTP is teaching social problem solving skills, and the results suggest treatment completion was significantly associated with lower 3-year rates of violent reoffenses. Thus it is possible that individuals who completed treatment learned useful problem solving strategies that they employed and thereby reduced their likelihood for further engagement in aggressive behavior. However, it is also possible that there are characteristics of participants who did not complete treatment that increased their risk for violent reoffense separate from treatment completion status.

Limitations and Future Directions

There are several limitations to this study that should be acknowledged. There were many cases with missing data that limited the sample size used in various analyses. The sample was also comprised of predominantly Caucasian males court-ordered to treatment, which suggests that the generalizability of the results to other outpatient anger management populations is limited. The mediation results in model one suggested that social problem solving attenuated the relationship between self-reported stress and aggression at time one such that self-reported stress no longer significantly predicted aggression, but social problem solving was not found to be a significant mediator. This result might have been significant had the sample size been larger. There were also relatively few individuals who re-offended within three years of treatment completion ($n = 29$). The study should be replicated with a larger, more diverse sample.

There are also limitations related to the derived stress scales. The measures of stress that were created were comprised of items from aggression-related measures. The items were selected based on their conceptual similarity to stress, however they were not validated by comparison to established measures of stress. That is, they have content validity but their construct validity has not been verified. Future studies should examine the construct validity of these stress scales by correlating them with established measures of stress. Additionally, examining the relationship between the self-reported stress scale, clinician-rated stress scale, and Stress in My Life Survey would be useful because it would provide a means of assessing the relationship between three measures that contain items specifically relevant to forensic populations.

The measure of social problem solving employed in this study was a self-report, process measure. Previous research has suggested that self-report measures of social problem solving,

while useful for examining attitudes and skills related to problem solving, might not be the best suited for examining actual problem solving performance (D'Zurilla & Maydeu-Olivares, 1995). Future studies should examine the proposed relationships between reported stress, aggression, and social problem solving using a behavioral measure of problem solving such as the Personal Problem-Solving System (PPSS; Ronan, 1990).

CHAPTER V

CONCLUSION

This study provides support for some of the basic tenets outlined in the General

Aggression Model. The notion that person and situation factors influence an individual's

likelihood of engaging in aggressive behavior was supported by the findings that reported stress,

both clinician-rated and self-reported, significantly predicted aggression. Social problem solving,

which was conceptualized as a person variable, was not found to significantly mediate the

relationship between reported stress and aggression, but this null finding might relate to the small

sample size and the self-report, process measure of social problem solving employed in this

study. The findings support the usefulness of the General Aggression Model for understanding

aggressive behavior and identifying targets for treatment.

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