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## State Anxiety and High-Risk Developmental Influences on Laboratory-Provoked Aggression Among College Men

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STATE ANXIETY AND HIGH-RISK DEVELOPMENTAL INFLUENCES ON  
LABORATORY-PROVOKED AGGRESSION AMONG COLLEGE MEN

by

Samantha L. Chase  
Master of Arts, University of North Dakota, 2009

A Dissertation

Submitted to the Graduate Faculty

of the

University of North Dakota

In partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

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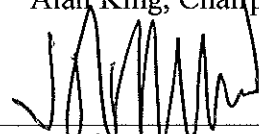
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This dissertation, submitted by Samantha L. Chase in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done, and is hereby approved.



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## ABSTRACT

Recent literature has identified a subtype of anxious people who appear to be at risk for aggression as opposed to inhibited and withdrawn as might be otherwise predicted among anxious individuals. While physical aggression is not typically associated with anxiousness, the current study examined the effect of both state and trait anxiety and other development factors on laboratory-provoked aggression in males.

Participants (N = 56) were randomly assigned to anxiety induction and control groups. An attempt was made to induce anxiety using a videotaped speech procedure. Several self-report measures were completed to gather developmental information such as history of aggressiveness, childhood abuse, exposure to domestic violence, executive functioning skills, and trait aggression. State anxiety was measured using heart rate and self-report measures, and aggressiveness was measured using the Taylor Aggression Paradigm (TAP), which required participants to compete and administer shock to a fictitious opponent. Consistent with hypotheses, increased provocation was successful in increasing the level of shock participants administered to fictitious opponents in a reaction time competitive task. State and Trait Anxiety were not found to have a significant impact on the level of aggressiveness observed in the laboratory experiment. Executive functioning, history of violent experiences, and trait aggression were not found to effect the aggressiveness of these laboratory participants. Implications for the

impact of provocation and a range of personal attributes on aggressiveness were discussed.

## CHAPTER I

### INTRODUCTION

Aggression is a complex and multifaceted construct that has been examined for decades both in the natural environment and laboratories (Parrott & Giancola, 2007). There are many definitions, forms, measurements and ways of expressing aggression making it difficult to analyze, theorize, and treat. A moderate amount aggression research is in the peer reviewed literature, but there is virtually no peer-reviewed research examining the effects of anxiety or anxious states and provocation on aggressive behavior in adult males.

According to Baron & Richardson (1994) aggression is “any form of behavior directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment” (p. 7). This provides perhaps the most comprehensive definition although research teams can independently decide on whatever operational definition they wish to apply. The two factors are usually central to the definition and they are negative intent and injury.

Over several decades of aggression research much advancement has been made. This historically broad construct has been simplified into subgroups and categories for ease of assessment and deeper levels of understanding (Parrott & Giancola, 2007). The more commonly mentioned categorizations are direct versus indirect, physical versus verbal, active versus passive (Buss, 1961), proactive versus reactive (Dodge, 1991),

overt versus covert (Buss, 1995), and overt versus relational (Crick, 1996). Despite the advancements in these classification permutations, many criterion inadequacies still exist and need refinement.

This study focused on direct and physically reactive aggression. Direct aggression is defined as acts directed toward a face-to-face or identifiable person where the victim is easily identified. Active aggression is defined as an active attempt to inflict harm on a victim. Physical aggression will be defined by actions intended to deliver physical pain or injury to a victim (Parrott & Giancola, 2007).

This study also focused on reactive aggression which is explained by emotional or “explosive aggression”. An individual who responds aggressively to frustrations or perceived offenses often due to emotion deregulation would be considered a reactive aggressive. Proactive aggression, which is usually the opposite of reactive, is not characterized by preceded provocation, but involves planning and deliberate acts in means of obtaining a desired goal. This would most likely be a school bully or “cold hearted” predatory aggressor of some sort.

It is assumed that emotions play a significant role in causing aggression, and several theories have been developed to account for the impact of affective factors on aggression. Two major competing theories differ in their speculation about the locus of the driving force for aggression. The frustration-aggression hypothesis (Dollard, Doob, Miller, Mower, & Sears, 1939) links situational factors (obstacles in goal pursuit) to aggressive acts. On the other hand, Catharsis theory suggests that the source of aggression is unexpressed anger and emotions build up over time and released when opportunities arise. Catharsis theory is influenced strongly by the assumption that

aggression is an innate or instinctual behavior, and these two fundamental models differ in their assumptions about whether or not aggression is internally or externally driven.

Contemporary researchers tend to emphasize the role of environmental factors and role models in the genesis of aggressive behavior. The venting anger models tend to enhance the aggressiveness of observers (Geen & Quanty, 1977) and put them at higher risk for engaging in angry acts in the future (Bushman, Baumeister, & Stack, 1999). These theories suggest and support several variables that could account for a person's aggressive behavior.

Other theoretical models emphasize the functions served by aggressive acts. Affect Regulation Theory (Bushman, Baumeister, & Phillips, 2001) posits that an individual aggresses with the expectation that it will lead to regulating their mood and feeling better. Emotion oriented theorists suggest that negative emotions are a primary factor of aggressive behavior. Berkowitz (1988) suggested that negative affect is a primary source in aggressive acts, which are produced by frustrations. Berkowitz (1990) has referred to the emotion and aggression relationship as Cognitive-Neoassociationist theory. In summary, his theory suggests that when an individual becomes aware of a negative or uncomfortable feeling he or she becomes highly activated in their cognitive realm. This translates into thinking about their feelings and considering the best way to act or behave. Those who are less able to engage their cognitive processes in coping with negative emotion may be more likely to respond in an aggressive or hostile manner. A natural extension of this model would include the role of executive functions as measured in neuropsychological testing as a mechanism to dampen and control negative emotion when exposed to conditions of duress.



Cognitive theorists have found the link between negative emotion and aggressiveness to be less clear. Chermack, Berman, and Taylor (1997) examined the emotional effects of provocation on men in the laboratory. They found that emotions did not contribute to the relationship between provocation and aggression as suggested by theorists, but provocation alone did have a significant impact on the aggression exhibited by the participants. They also did not find that emotions moderated the relationship between provocation and aggression. In essence, participants who were in a group in which opponents exhibited lower levels of shock were not as aggressive as participants who were competing with an opponent with significantly higher levels of provocation, regardless of intensity of emotional state. The current study attempts to incorporate both the emotions-aggression theory and cognitive theories that suggests a person's perceptions of the social environment, such as provocation, are direct antecedents of aggression.

#### Anxiety and Aggression

The relationship between anxiety and aggression is not thoroughly understood and there have been wide individual differences found in this relationship within experimental samples. Substantial research does establish frequent comorbidity between anxiety symptoms and reactive aggression in children (Card & Little, 2006; Marsee, Weems, & Taylor, 2008; Vitaro, Brendgen, & Tremblay, 2002). Adult samples have also frequently been researched within these two areas, but is less conclusive by producing a positive and negative correlation between the two, which has presumably sparked curiosity among researchers. Storch, Bagner, Geffken, and Baumeister (2004) conducted a study that exhibited a positive relationship between social anxiety and both

relational and overt aggression in a sample of 287 undergraduate college students. DeWall, Buckner, Lambert, Cohen, and Fincham (2010) conducted a series of studies examining the relationship between social anxiety, hostility, and aggression with adult males and females. The first in the series was an on-line survey study with 1,689 participants examining the relationship between social anxiety and feelings of hostility toward others. As predicted, social anxiety was a significant predictor of hostility; results also suggested that individuals with social anxiety disorder reported significantly higher levels of hostile feelings toward others than the non-socially anxious group. The positive relationship between these two clinical variables increased when the level of anxiety was in the clinically significant range. They conducted a follow up study to validate and expand on these findings. They yielded results indicating those who reported experiencing social anxiety symptoms not only reported higher feelings of hostility, but also perceived others as hostile also. To test their hypothesis that socially anxious individuals perceive violent acts as negative, their third study assessed how socially anxious individuals perceive intimate partner violence through the use of questionnaires. Results supported the literature in that socially anxious individuals have less positive attitudes toward people who are aggressive toward ones relationship partner. In their final study, they examined whether socially anxious individuals responded aggressively when placed in confrontational situations. They hypothesized that they would not act aggressively due to their fear of being rejected for acting out and results supported this hypothesis. Overall, DeWall et al. (2010) found that socially anxious individuals had more hostile attitudes toward others and perceived others as being more hostile. Such individuals also had a less positive

view of aggressive acts and, therefore, were less likely to act out aggressively in fear of being negatively viewed by others.

Opposing some of these findings, Phillips and Giancola (2008) evaluated 80 males, and how experimentally induced anxiety can attenuate alcohol related aggression. Their results suggested that induced anxiety attenuated aggression in intoxicated subjects. In contrast, another recent investigation found that social phobics (Social Anxiety Disorder) were at greater risk to respond aggressively to provocation. Two different patterns of response were found within their socially anxious sample, a typical pattern of behavioral inhibition and withdrawal to avoid rejection, while the other group was curiously impulsive, novelty seeking, and aggressive (Kashdan & Hofmann, 2008; Kashdan, McKnight, Richey, & Hofmann, 2009). These findings suggested that a subset of individuals placed in anxiety provoking situations may act out aggressively for defensive benefits that are not fully understood. There was some suggestion that the atypical disinhibited and aggressive responses were more likely among male compared to female social phobics. A growing literature does suggest heterogeneity in the expression of aggression among socially anxious participants. The current study aims to further investigate the atypical subset of anxious individuals and how their state and trait anxiety after provocation may contribute to their level of aggressiveness.

Social anxiety is invariably associated with avoidance tendencies from situational factors that are associated with threat or rejection. One study by Erwin, Heimberg, Schneier, and Liebowitz (2003) found that highly socially anxious individuals experience more frequent anger, severe depression, and had less effective

anger expression skills than non-anxious control participants. The anxious individual's possessed maladaptive anger expression, which resulted in them turning the anger "in" or internalizing the anger. However, the socially anxious participants were no less likely than controls to outwardly express anger toward people or objects or to assess or control their anger expression (Erwin et al., 2003; DeWall et al., 2009), which could lead to unhealthy or impulsive expression of anger such as physical aggression. Insel, Scanlan, Champoux, and Suomi (1988) conducted a study that induced anxiety using an anti-anxiolytic drug (GABA antagonist) in Rhesus monkeys during 18-24 months of life. In the monkey's first year of life prior to drug administration the monkeys were raised in two groups differing in degrees of mastery or control of basic needs (food, water, and treats). One group had a high level of control and the other had no control of when their basic needs were going to be met. The monkeys raised in the high level of control group displayed more aggressive behavior in observations than the yoked subjects, who responded with the expected fear response after a high dose of the anxiety-inducing drug. Indeed, the study by Insel et al. (1998) presents a sociophysiological model of the impact of anxiety on aggressive behavior. The environment the monkeys were raised in and the physiological impact of anxiety seems to have fostered different expressions of that anxiety. A longitudinal study by Nichols, Graber, Brooks-Gunn, and Botvin (2006) examined overt aggression and delinquency of urban adolescent males and females. Results suggested that across gender, anger and self-control were significant predictors of an increase in overt aggressive behaviors among urban minority adolescents. One could speculate that high perceived control and social dominance is more inclined to generate independent, even antisocial qualities

that lead to aggressive coping responses in response to provocation. Timidity may be magnified by uncontrolled environmental settings during development and seems to be more likely to produce inhibition as a coping response. After reviewing these studies, it seems evident that some set of mediating factors must come into play in determining who will and will not respond actively and aggressively to situational provocation; therefore, more investigation of some of these mediating factors is much needed.

#### *Abuse Exposure and Adult Aggression*

The potential impact of role modeling is an important factor and should also be taken into account in efforts to explain the development of aggressive proclivities. Albert Bandura's Social Learning Theory (1977) has led to many compelling demonstrations regarding the impact of role modeling on aggressiveness. In their classic study (Bandura, Ross, & Ross, 1961) pre-school children were assigned to one of three different conditions (an experimental group that observed aggressive adult models, another group that observed non-aggressive adult models, and a control condition who did not observe adult models at all). Participants who observed the aggressive adult models behaved similarly to what was demonstrated for them. They engaged in aggressive acts significantly more than participants in the non-aggressive and control condition. Thus, vicarious learning history may also serve as an interaction variable in determining adult reactions to threat. Bandura's theory has been used to explain the relationship of the General Aggression Model (GAM; Anderson & Dill, 2000). The GAM is a multi-stage system in which personal traits (e.g. trait aggression) and situational (e.g. provocation) input variables lead to aggressive (or non-aggressive) behavior. A study by Chermack and Walton (1999) adds to the literature, results

indicate that the experience of aggression and violence during childhood is significantly related to the expression of aggressive and antisocial behavior in adulthood. These results are consistent with the social learning view of aggression proposed by Bandura (1977). Lending to the socialization of aggressive tendencies, White and Humphrey (1994) also found that predictors of physical aggression are past aggressive tendencies in adolescents, exposure to parental aggression and past victimization of aggression. A number of studies have observed the impact of observed domestic abuse. Henning, Leitenberg, Coffey, Bennet, and Jankowski (1997) found that participants who reported witnessing domestic abuse during development demonstrated higher levels of psychological distress, as assessed by self-report measures, compared to peers reporting minimal to no such instances. Moe, King, and Bailey (2004) conducted a laboratory study examining the effect of childhood abuse on aggressive behavior in college males. The results suggested physically abused children and adolescent males were significantly more aggressive as adults than the control subjects. One could speculate that exposure to childhood physical abuse, witnessing domestic abuse, or being exposed to aggressive acts can be influential variables in the development of aggressive patterns of responding to provocation. Just as other unhealthy or healthy coping mechanisms are learned from what is modeled in childhood by parents or guardians, the same is true for coping with anger and hostility. Adding to the victimization literature, Mugge (2011) examined the effects of executive functioning (EF) deficits and childhood abuse on laboratory aggression. She found that individuals, who reported experiencing adverse childhood events, particularly bullying and teasing during childhood, were more aggressive than those who did not have these experiences.

Aggressive responses to anxiety have been more thoroughly and frequently researched in children than adults, and understanding this relationship in children could lend insight into adult behavior as well. Research has suggested that reactively aggressive children are more likely to have experienced a history of abuse and emotional regulation difficulties, which results in them displaying higher levels of anxiety disorder symptoms (Dodge, Lockman, Harnish, Bates, & Pettit, 1997). Bubier and Drabick (2009) conducted a study examining anxiety and disruptive behaviors in children and adolescents. Their results suggested shared risk factors that included neighborhood violence, parental behaviors, and genetics underlies the co-occurrence of anxiety and disruptive disorders. However, in a study by Dodge (2006) it was demonstrated that aggressive behavior was most prevalent in young child prior to entry into school, which contradicts the notion that aggression is mainly socially learned. This lends to the literature claiming that other important non-social factors contribute to aggressive behavior.

### *Executive Functioning*

Executive functioning (EF) is a generally constructed term to describe higher order cognitive functioning such as planning and organization, which are involved in the self-regulation of goal-directed behavior. Deficiencies in EF, such as poor impulse control, lack of planning and organization skills, and limited empathy for others are all aspects that make up executive functioning deficiencies. Executive functioning deficits have been shown to be strongly related to aggressive and violent behavior (Giancola & Zeichner, 1994; Moffitt, Lynam, & Silva, 1994). Giancola (2004) also found a negative relationship between EF and aggression, meaning as EF improves aggressive behavior

lessens; however, this finding was only significant in male participants. Their results also indicate the effects of alcohol are more likely to increase aggression in males with lower levels of EF and not females, likely because alcohol attenuates anxiety. They suggest the gender difference could exist for several reasons such as societal expectations that women do not express aggression and other speculative reasons. In addition, Hoaken, Shaughnessy, and Pihl (2003) examined the relationship between executive functioning and the ability to inhibit impulsive behaviors. This study utilized the Taylor Aggression Paradigm as a measure of aggression, similar to the present study. Impulsive behavior was examined using the Go/No Go discrimination task, which measures an individual's capacity to withhold a response to a stimulus that has been paired with reinforcement or punishment (Helmers, Young, & Pihl, 1995). Those who scored poorly on measures of executive functioning were more aggressive when completing the TAP (Hoaken, Shaughnessy, and Pihl, 2003).

#### *Gender Differences*

It has been widely found that males are more apt to engage in direct physical aggression than women (Richardson & Hammock, 2007; Giancola, Levinson, Corman, Godlaski, Morris, Phillips, and Holt, 2009). Women, however, have been shown to be more likely to engage in indirect or relational aggression (Crick & Grotpeter, 1995; Vaillancourt, Miller, Fagbemi, Cote & Tremblay, 2007). When Giancola et al. (2009) examined gender differences among intoxicated individuals they found that being intoxicated increased aggression in men and women, but more so in males. Harris (1996) administered self-report measures to an ethnically diverse sample of university students and found gender differences similar to previous research; males experienced



and reported being more aggressive than women. Gender differences were most apparent when analyzing physical aggression. Storch et al. (2004) found that males were more overtly and relationally aggressive than females. Given this trend in the literature one could deduce that physically aggressive behavior will likely be more prominent in males.

### *Laboratory Induced Anxiety*

In previous research there has been several methods employed to induce stress or anxiety in a laboratory setting, such as having participants run in place, turn head from side to side, or engage in a public speaking task. Such public speaking tasks have been commonly used as a method of increasing stress and anxiety in the laboratory.

Stress responses are most reliable when assessed using multiple measures (Sayette, 1999). The present study assessed heart rate and self-report anxiety, which are both commonly used measures of stress induction (Sayette, 1993). Hazelett-Stevens and Borkovec (2001) examined several relaxation strategies on decreasing anxiety before engaging in a public speaking task. Heart rate and subjective measures were used to assess anxiety levels throughout the experiment. Their results indicated that anxiety levels of the relaxation and control groups declined at an equivalent rate across five speeches. One could presume that practicing or repeating a speech naturally decreases anxiety similarly to those who use and employ relaxation techniques before delivering a speech. The group that was allowed to worry prior to the speech delivery reported increased anxiety across speech presentations. Overall, the practice, rehearsal, or thought of giving a speech activated fear in all three groups. Similarly, a study conducted by Rutigliano (1999) also utilized a public speaking task to induce anxiety

where participants were asked to deliver a speech or write a paragraph about their hometown. They were also tested with homographs, which are words that are spelled the same but pronounced differently, to assess cognitive bias of the participants. Participants with high-anxiety interpreted more threatening messages from the homographs than the low-anxiety group. Previous research suggests the addition of a video camera enhances the anxiety response by increasing evaluative pressure on the participant (MacIntyre & Gardner, 1994).

### Overview

The current literature could benefit from additional study of the role of anxiety on laboratory-provoked aggression. While research is available on emotion-aggression correlation and provocation on aggression, minimal data is available regarding the induction of anxiety and aggression within highly controlled laboratory settings. Anxiety is generally assumed to inhibit aggression because of fears of retaliation or rejection. Conversely, there is growing literature demonstrating a subset of individuals with anxiety problems who behave atypically, by behaving aggressively in anxiety provoking situations. Kashdan et al. (2009) found that participants that were categorized into the risk prone group had lower SES, education, and was younger in age. The present study examined other developmental variables that could contribute to aggressive or antisocial tendencies. If such an atypical manifestation of anxiety does exist, such information could aid in the earlier detection, more accurate diagnosis, and employment of effective treatments with patients who likely are not receiving appropriate treatment.

One could speculate that individuals with social anxiety disorder are likely to act aggressively as an atypical way of avoiding evaluation. The frustration-aggression hypothesis might suggest that provocation proves more frustrating for anxious individuals, resulting in them being more aggressive. The present study attempted to address the interaction of emotion-oriented (anger and frustration) and cognitive or perception (provocation or barriers) theories on aggression. Given the trend in the literature that suggests males are more physically aggressive than women, the current study exclusively examined male participants.

It was hypothesized for the current study that the effects of anxiety on aggressive responding in the laboratory depended on a number of secondary, interaction factors such as executive functioning, locus of control, previous aggressive experiences, history of violent experiences, and trait anxiety.

1. Higher aggression is predicted to occur among male participants with evidence of executive functioning deficits, a history of violent experiences during upbringing, and/or trait aggression.
2. The increase of provocation is predicted to increase aggression
3. Higher aggression is expected to have significant relationships among those categorized “at risk”, such as those with higher trait anxiety, state anxiety, abuse history, and with a more external locus of control.

## CHAPTER II

### METHOD

#### Participants

Participants for this study consisted of 56 college males, ages 18 to 40. The age of participants was restricted because antisocial behavior (DSM-IV-TR, 2000) and aggressive behavior has been shown to decline with age (Rushton, Fulker, Neale, and Nias, 1989; Dabbs, 1997). Participants were recruited through flyers, electronic research website, psychology courses, and word of mouth. Those who chose to participate were compensated for their time with the choice of a monetary stipend of \$10.00 or 1 hour extra credit in an undergraduate psychology course. Participants with major medical conditions or heart problems were not allowed to participate, due to study procedures.

#### Measures

The following materials make up the questionnaire packet that was administered to participants during the study; the questionnaires assessed for demographic information, state anxiety, trait anxiety, violent experience history, aggression history, self-report aggression, executive functioning, and locus of control.

#### *Informed Consent*

Participation in this study was anonymous and all information confidential. Participant's data was coded numerically in the database and informed consent forms

were stored separately from the data packets to prevent an individual's association with the study. Informed consent was created in accordance with the guidelines of the Institutional Review Board (IRB). Risks and benefits of participating in the study were explained. It was also explained to the participant that their participation is completely voluntary and they are free to withdraw at any time without consequence.

#### *Demographic Questionnaire*

The demographic questionnaire was constructed by the principle investigator to inquire about potentially relevant factors within the following categories: age, gender, education, and marital status. It provides information regarding general characteristics of the sample.

#### *Violent Experiences Questionnaire-Revised (VEQ-R)*

The previous version of the Violent Experiences Questionnaire-R (Moe, King & Bailly, 2004; Moe, 2005) was used to estimate the frequency with which individuals have experienced or observed parental aggression during childhood (ages 5 to 19). The VEQ is comprised of ten items that describe common acts of parental anger directed toward either the child or other parent (usually the mother) during childhood. Frequency is counted retrospectively (calculated from a nine-point rating scale) for five of these ten actions and are used to generate subscale scores for family conflict (minor disagreements & heated verbal arguments) and aggression (pushing/shoving, striking/punching, & threats of physical violence during heated arguments). VEQ scores range from 0 to 365 signifying the number of days on average per year during childhood that a specific act was either Witnessed (between parents) or directly Experienced (delivered by either parent). Participants were classified as positive in

child physical abuse (CPA) if they reported one or more incidents (Experienced Aggression) per year (over the 15 year retrospective recording period) of being pushed, shoved, struck, punched, or threatened with physical violence during heated arguments. King (2002) found that VEQ Experienced Aggression scores had acceptable six-week test-retest reliability,  $r(86) = .86, p < .001$ . Individuals generating elevated ( $> 9$  incidents per year) Experienced Aggression scores infrequently ( $< 5\%$ ) recanted their recollections of parental abuse in retesting.

King (2009) later revised the VEQ item wording and subscale structure (VEQ-R) since the VEQ and prior measures of abusive parental behavior failed to distinguish between participant descriptions of corporal punishment and physical abuse. The potential benefits of distinguishing between parental and sibling perpetrators of physical abuse were recognized as well in the VEQ-R with an expansion of index events that included step-parents and step-siblings. The recording period for these retrospective events was narrowed to ages 5 through 16. The VEQ-R now provides 15 subscales of respondent recollections during childhood:

- 1) corporal punishment (**CORP**);
- 2) parent-child verbal discord (**PCD**);
- 3) sibling-child verbal discord (**SCD**);
- 4) parent-parent verbal discord (**PPD**);
- 5) parent-child violence threats (**PCT**);
- 6) sibling-child violence threats (**SCT**);
- 7) parent-parent violence threats (**PPT**);
- 8) parent-child physical abuse (**PCA**);
- 9) sibling-child physical abuse (**SCA**);
- 10) parent-parent physical abuse (**PPA**);
- 11) parent-child violence consequences (**PCC**);
- 12) sibling-child violence consequences (**SCC**);
- 13) parent-parent violence consequences (**PPC**);
- 14) peer bullying index (**PBUL**);
- 15) peer teasing index (**VBUL**).

All of these VEQ-R indices are still scored on a 0 to 365 metric interpreted as the average number of days per year that one or more events in the index class occurred over the course of 12 years during the 12-year retrospective recording period of ages 5 to 16.

Subscale scores can be derived as well for any of the three recording periods (5-8, 9-12, or 13-16). Normative data generated from the Experienced Aggression subscale of the VEQ (generally interpreted as “parental physical abuse”) should correspond closely with Child physical abuse scores from the VEQ-R.

#### *Buss-Perry Aggression Questionnaire*

The Buss-Perry Aggression Questionnaire (BPAQ; 1992) is a widely used measure of assessing trait aggression. It consists of 29 items in which participants respond on a 7-point Likert scale (1=Extremely Uncharacteristic of Me; 7=Extremely Characteristic of Me); the participant is encouraged to answer in a manner that best describes their aggressive response tendencies. The original measure created by Buss and Durkee (1957) was commonly used to distinguish between violent and non-violent men, delinquent and non-delinquent adolescents, and to group high and low aggressors for research purposes (Buss and Perry, 1992). There are four subscales that make up the aggression total score: Physical aggression, Verbal aggression, Anger, and Hostility. The BPAQ has been shown to have solid psychometric properties (Buss and Perry, 1992; Tremblay and Ewart, 2005).

### *State Trait Anxiety Inventory*

The State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, and Jacobs, 1970) is a widely used instrument to measure situational anxiety and long standing anxiety qualities in adults. The STAI is popular for its utilization with individuals of varying races, gender, and educational backgrounds. The STAI requires at least a sixth grade reading level. It is also helpful in distinguishing between feelings of anxiety and depression. The STAI is comprised of 40 items, twenty items per subsection. The score for each subsection ranges from 20-80; a higher score indicates greater anxiety (Spielberger et al., 1970). In this study the STAI will be used to assess subjective ratings of general and situational anxiety of participants.

### *Executive Functioning Index*

The Executive Function Index (EFI; Spinella, 2005) is a brief, subjective measure of executive functioning in clinical and non-clinical populations. A total of 27 items on a 5-point likert scale ranging from “not at all” to “very much” makes up the EFI. It consists of five factors, which are related to recognized domains of executive functioning: Empathy (EM), Strategic Planning (SP), Organization (ORG), Impulse Control (IC), and Motivational Drive (MD). Adequate reliability and validity for the EFI has been established in previous research (Spinella, 2005). In the current study, the EFI was used to assess the relationship between participant’s executive functioning and aggressive responding.

### *Rotter’s Internal-External Locus of Control Scale*

The Locus of Control Scale (Rotter, 1966) is a 29 item subjective measure of general (internal vs. external) locus of control that is still commonly used. Of the



twenty-nine items, twenty-three of them measure locus of control and the other six are “filler” items. It is a forced-choice format and scored by allotting points to particular responses. The higher the score the more likely an individual believes they do not have control over their fate and give credit to chance or luck (external locus of control). Additionally, research has established this measure has high concurrent and discriminant validity (Zerega, Tseng, & Greever, 1976).

### *Taylor Aggression Paradigm*

The Taylor Aggression Paradigm (TAP; Taylor, 1967) is a direct physical aggression paradigm that has sufficient validity as a measure of direct physical aggression in men and women. Participants are led to believe they are competing in a computerized time reaction task against a fictitious opponent. The participant receives shocks if they lose a trial and are allowed to administer shocks ranging in intensity to their fictitious opponent if they win a trial. Since it is a computer based program provocation and number of trials can be manipulated. Aggression was operationally defined by the average shock intensity selected by the participant for their fictitious opponent within a set of trials. There is external validity for the TAP indicating that an individual who responds aggressively on the TAP is a person who will likely respond aggressively outside of the laboratory (Giancola & Parrott, 2008). The TAP has been widely used in research investigating the effects of alcohol on aggressive behavior. Alcohol increases aggression for both men and women; however, alcohol has a much stronger effect on men than it does women (Giancola, Levinson, Corman, Godlaski, Morris, Phillips, & Holt, 2009).

### *Heart Rate*

There are several means that have been utilized in past research to measure the intensity of stress response in stress-induction paradigms. Heart rate, in addition to galvanic skin response, blood pressure, and cortisol activity has all been used as objective measures of physiological arousal. Heart rate has been widely used to measure objective physiological arousal to emotions such as panic, anxiety, and anger. Lavoie, Fleet, Laurin, Arsenault, Miller, and Bacon (2004) utilized heart rate as a measure of panic symptomatology in a study regarding the presentation of panic in patients with coronary artery disease. Muftizade (2006) utilized heart rate, blood pressure, and state-anxiety reports to determine the effectiveness of “metamorphic technique” (defined as, “a light touch to the spinal reflex points of the feet, hands and head”) in the reduction of objective and subjective measures of anxiety.

### *Procedure*

Participants voluntarily signed up for the present study. When participants arrived individually to the lab they were first explained the consent form and an overview of procedures of the study.

Thank you for participating in this study. As you may or may not know this study is examining the effects of stress on reaction time. Before we get started I would like you to complete a few questionnaires and turn them into me. I will then take your heart rate and we will continue with the remainder of the study. It is important that you understand you can choose to discontinue your participation in this study at any time. Do you have any questions?

Participants completed the survey packet, which consisted of the Demographic questionnaire, VEQ, Buss Perry Questionnaire, Locus of Control measure, EFI, and the STAI. Participants were then informed that since the study is examining stress

induction and reaction time they had to prepare and deliver a 3-minute speech about their hometown experience in front of a video camera. They were also informed of the reaction time task they needed to complete before delivering their speech.

*Anxiety Induction.* For those individuals who were randomly assigned to the anxiety induction groups, the manipulation was carried out as follows: They were read the following script:

You will be taking part in a portion of the study that will be testing your stress tolerance and reaction time. We are interested in your ability to think quickly with limited time to prepare a personal speech. Research has shown that this skill is related to reaction time. For this task you must quickly prepare and deliver a short speech about your home town and what you liked and disliked about it in front of this video camera that will record your speech. You will be given 3 minutes to prepare a three-minute speech. You will deliver your speech immediately following your completion of the reaction time task. It is very important that you think about the speech you are about to give. This has been shown to improve performance on the reaction time task. This clock will now give you a 3-minute countdown. You will have this time prepare your speech in your mind. When the 3 minutes are up you will begin the reaction time task.

In actuality, participants who received this manipulation did not have to deliver a speech; this was only employed to induce anxiety. Immediately following, the participants heart rate was taken a second time and then they were given 3 minutes to prepare their speech. After the 3-minute speech preparation period and prior to the aggression task the participant's heart rate was assessed for the third time. Also after the 3 minutes they completed the STAI to assess self-report anxiety and then immediately participated in the reaction time task. Those who are not receiving the anxiety induction waited for 3 minutes after completing the questionnaire packet and were re-administered the State Anxiety portion of the STAI and had their heart rate measured prior to the aggression task to remain equivalent to the experimental group.

The experimental group was led to believe that following the reaction time task they would begin delivering their speech in front of the video camera. In actuality, the participants were given the manipulations check to assess their thoughts about the reaction time task and their opponent. Following the completion of these measures the participant was thoroughly debriefed and compensated with either extra credit or ten dollars for their participation.

*Aggression task.* For the aggression task procedure participants were seated at a table with a computer monitor and keyboard facing them. The keyboard had keys noticeably labeled 1 to 10, for choosing shock intensity.

The following procedure and pain threshold is equivalent to, with the exception of minor details, the procedure utilized by Phillips and Giancola (2008). Following completion of the STAI and assessment of heart rate for the second time the aggression task was explained to the participant. They were informed that after the words “Get Ready” appears on the screen the words “Press the Spacebar” would appear, and at this time they were instructed to hold down the spacebar. Following this, the words “Release the Spacebar” appeared on the screen and they were to lift their fingers off of the spacebar as fast as possible. The computer told them whether they won or lost against their factitious opponent. If they won they saw the words “You Won. You Get to Give a Shock” and if they lost they were signaled by the words “You Lost. You Get a Shock.” If participants won a trial they were allowed to administer a shock to their opponent and if they lost a trial they received a shock from their opponent. Keep in mind there was no actual opponent receiving or administering shock. Participants chose a shock for their opponent of varying intensity and the keyboard reflected the numbers

one through ten. Participants were told that #1 delivers a “very mild” shock and were explained as “definitely not painful” and #10 is the highest amount of shock and was explained as “painful.” This procedure is a widely used measure of nonaggressive response option and is widely used (Giancola & Chermack, 1998). The participants were led to believe the same rules applied for their opponent and that if they lose a trial they will receive a shock in which the intensity will be chosen by their opponent. The participant was left alone in the room during the 3 minutes of speech preparation, but not during the aggression task.

There were two blocks of trials, each block consisting of 16 trials. During both blocks the participant lost and won an equal number of trials (eight wins and eight losses), which were presented in fixed-random order by the computer. The first block represented low provocation and the participant only received shock intensity between “1” and “4” after they lost a trial. The second block represented the high provocation and participants received shocks with intensity between “7” and “10” after losing a trial. There were also two transition trials between blocks in which participants lost both trials and received a shock of “5” and “6” intensity. These trials were added to make the transition to more intense shocks smoother. Overall, there were a total of 34 trials. All shocks delivered to the participant will be 1 second in duration. In actuality, response time was not recorded.

Orozco and Lukas (1999) found that both males and female ethnic minority participants responded more aggressively towards the ethnic group in which they self-identified. Thus there was no indication to what ethnicity, age, or affiliation their factitious opponent is. They were led to believe they are competing against a participant

of their same gender, which has been employed in previous research (Giancola et al., 2009).

*Deception manipulation.* To disguise the task as a measure of aggression, participants were given a factitious cover story. To convince participants that they were actually participating against another person, several gestures and dialogue was told to the participant to emphasize that there was another participant in an adjacent room. After the researcher assessed the participant's pain threshold and tolerance the researcher went into an adjacent room to assess the "opponent's" tolerance levels. The actual participant was also asked to sit and wait for a few moments right before the TAP task began to check and see if the other "participant" in the other room was ready to start as well.

*Pain threshold and tolerance testing.* Before beginning the aggression task participants were assessed for their pain threshold and tolerance to determine intensity parameters for the shocks they received. This was done by administering shocks of short duration (1 second) that increased in intensity in a stepwise manner beginning with the lowest shock which was unapparent, until the shocks reached a subjectively verbal reported "painful" level. All shocks were administered through a two finger electrode attached to the index and middle fingers of their non-dominant hand with Velcro straps. Participants were asked to inform researcher when the shocks were first "detectable" and when they reached a "painful" level. During the actual testing the participants received shocks that range from 1 to 10. These shocks were set at 55%, 60%, 65%, 70%, 80%, 85%, 90%, 95%, and 100% of the highest tolerated shock

intensity. The tolerance procedure was conducted while the participant was seated in the testing room and the researcher in the same room.

*Post-aggression task measure.* After completion of the aggression task participants were given the AEQ, a questionnaire that assessed their history of physically aggressive behavior after the age of 14.

*Manipulation Check.* Following completion of the aggression task participants also completed a short questionnaire indirectly assessing the credibility of the experimental manipulation, which aided in determining if deception was successful.

Participants were then fully debriefed to the true nature of the study and asked not to disperse the deception information as it may hinder further experimentation. The participant was compensated for their time with a choice of \$10 cash or extra credit in a psychology course.

## CHAPTER III

### RESULTS

#### Manipulation Check

An exit questionnaire was used to assess the success of the deception utilized in the TAP task. Participants were asked about his or her perception of the opponent's age, identity, and aggressiveness. All but 11 of the participants indicated a belief that they were competing against a real opponent, providing evidence that the deception was successful. When asked on the exit questionnaire if they had an idea of who their opponent was, these 11 participants responded in a fashion that indicated they thought they were competing against another researcher or the computer. These 11 participants were excluded from any analysis related to the TAP measure.

#### Descriptive Statistics

Fifty-six male subjects participated in this study, twenty-nine of which were in the control group and twenty-seven of which were assigned to the experimental or anxiety induction group. A large majority of subjects were undergraduate students enrolled in a psychology course and likely participated in research for extra credit. Of the 56 participants, 78.6 % were Caucasian, 3.6 % Native American, 3.6 % Hispanic, and 5.4 % African American. The average age of participants was 20.4 years old; sixty-nine percent of participants were single and 26.8 % were in a relationship. Of particular interest was the extent to which participants endorsed experiencing anxiety



on average (Trait Anxiety), endorsed deficits in dimensions of executive functioning (EFI), and the degree to which participants were bullied or exposed to violent experiences in childhood or adolescents (VEQ-R). Also of interest was participant's locus of control (Rotter's LOC) and history of aggressive experiences (AEQ). The outcome measure of primary interest was the average intensity of shock that participants administered to fictitious opponents in the laboratory competitive exercise (TAP). The statistics for the independent and dependent variables examined in this study are summarized in Table 1.

Table 1. Independent and Outcome Variable Distribution Summary for Overall Sample, N=56.

	<i>Range</i>	<i>Mean</i>	<i>SD</i>
Age	18-34	20.42	3.14
Grade Completed	9-16	13.23	1.37
Aggressive Experiences Questionnaire (AEQ)	0-15	2.1	2.79
Table 1 continued.			
AEQage	0-23	14.43	7.03
Violent Experiences Questionnaire (VEQ-R)			
<i>Corporal Punishment</i>	0-104	5.95	15.28
<i>Parent-Child Verbal Discord</i>	0-56	11.51	17.12
<i>Parent-Child Violence Threats</i>	0-12	.62	2.5
<i>Parent-Child Physical Abuse</i>	0-.75	.07	.19
<i>Parent-Child Violence Consequences</i>	0-.08	.00	.01
Sibling-Child Verbal Discord			
<i>Sibling-Child Violence Threats</i>	0-104	20.12	30.62
<i>Sibling-Child Physical Abuse</i>	0-104	6.60	18.20
<i>Sibling-Child Physical Abuse</i>	0-38.6	3.84	8.82
<i>Sibling-Child Violence Consequences</i>	0-.08	.00	.01
<i>Parent-Parent Verbal Discord</i>	0-104	8.8	22.61
<i>Parent-Parent Violence Threats</i>	0-17.95	.64	2.93
<i>Parent-Parent Physical Abuse</i>	0-12	.26	1.61
<i>Parent-Parent Violence Consequences</i>	0-12	.21	1.60
<i>Bullied</i>	0-56	5.16	13.31
<i>Teased</i>	0-69.50	10.05	16.48
Executive Functioning Index (EFI)			
<i>Motivational Drive</i>	79-116	97.82	7.41
<i>Organization</i>	11-20	15.82	2.35
	16-27	20.93	2.87

Table 1 (continued)

	<i>Range</i>	<i>Mean</i>	<i>SD</i>
<i>Strategic Planning</i>	16-28	21.14	2.60
<i>Impulse Control</i>	7-22	15.93	2.99
<i>Empathy</i>	18-29	24.00	2.97
Buss-Perry Aggression Questionnaire (BPAQ)	47-143	84.36	20.33
<i>Physical Aggression</i>	10-55	29.09	10.55
<i>Verbal Aggression</i>	8-27	17.55	4.81
<i>Anger</i>	7-38	16.55	6.41
<i>Hostility</i>	8-52	21.16	8.98
Taylor Aggression Paradigm (TAP)			
<i>Average Shock Intensity</i>	1-10	4.57	2.64
<i>Average Shock at Baseline</i>	1-10	4.05	3.21
<i>Average Shock Duration</i>	92-1645	430.59	
390.31			
<i>Highest Shock</i>	1-10	7.71	3.13
Rotter's Locus of Control	7-20	12.41	3.06
State Anxiety	20-60	33.14	10.23
Trait Anxiety	21-53	35.27	8.13

Table 1 shows the data for the State and Trait Anxiety scale, with 80 being a maximum score for one subscale of the STAI. Each subscale also was successful in producing a wide variability with the present sample (Figure 1 and 2). On average, a participant's score on the Rotter's Locus of Control (LOC) scale was 12.41, with a possible high score of 23; higher scores indicate a more internal LOC and lower scores a more external LOC. The average number of past aggressive experiences was 2.1 and the average age of these experiences occurred is 14.43 years of age (AEQ age).

Figure 1 shows the data for the Trait Anxiety total scores for the present sample as measured by the STAI. This measure appears to be successful in generating fairly wide variability in the extent to which participants reported experiencing anxiety in general. The average participant had a mean score of 35.27 with a standard deviation of

8.127, which does not differ markedly from other data derived from college samples ( $M=38.30, SD=9.18$ ). In particular, this mean score falls at the 33<sup>rd</sup> percentile for college males and a score of 40 is indicative of clinical significance, indicating a level of anxiety that may cause some difficulties in daily functioning (Spielberger et al., 1970).

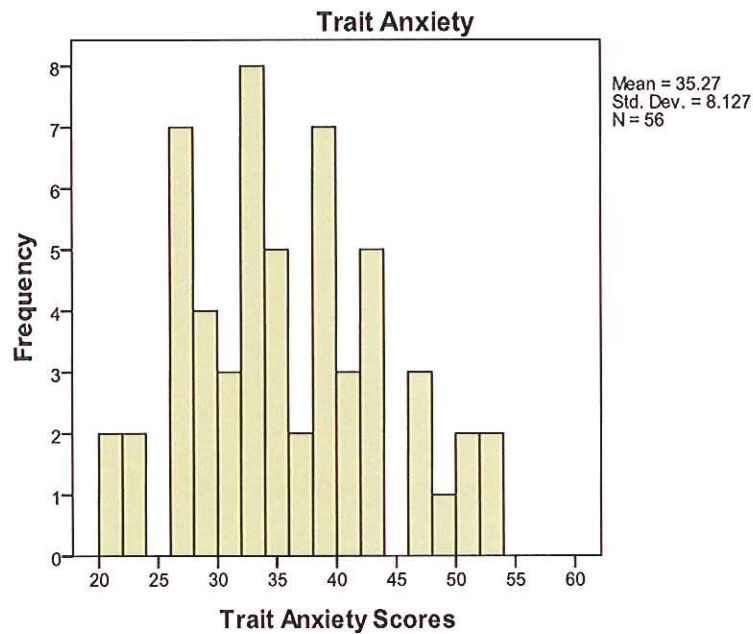


Figure 1. Frequency distribution for the Trait Anxiety subscale of the STAI measure.

Figure 2 shows the distribution of State Anxiety total scores as measured from the STAI, which displays that the present sample reported a wide variability in the amount of State Anxiety experienced. The average participant has a mean score of 33.14 falling in the 46th percentile for college males. Scores of 38 or higher fall in the clinically significant range and indicates that the level of anxiety may be problematic (Spielberger et al., 1970).

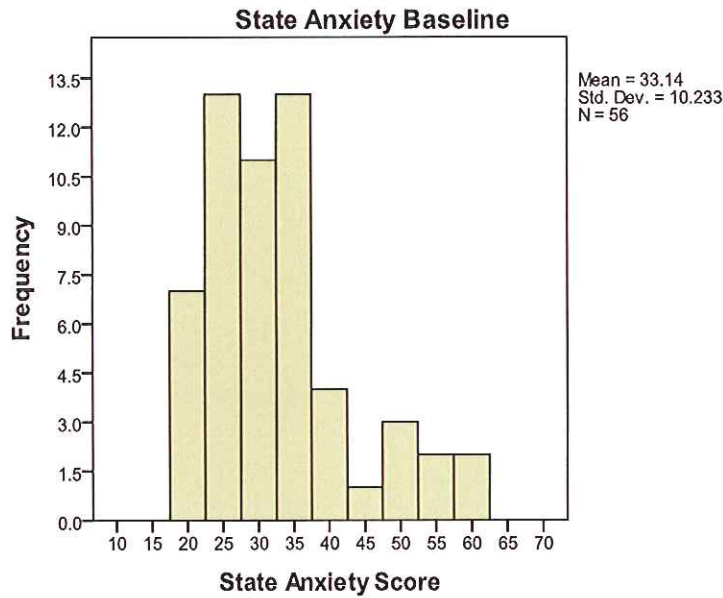


Figure 2. Frequency distribution of State Anxiety scores pre-manipulation or wait time as measured by the STAI.

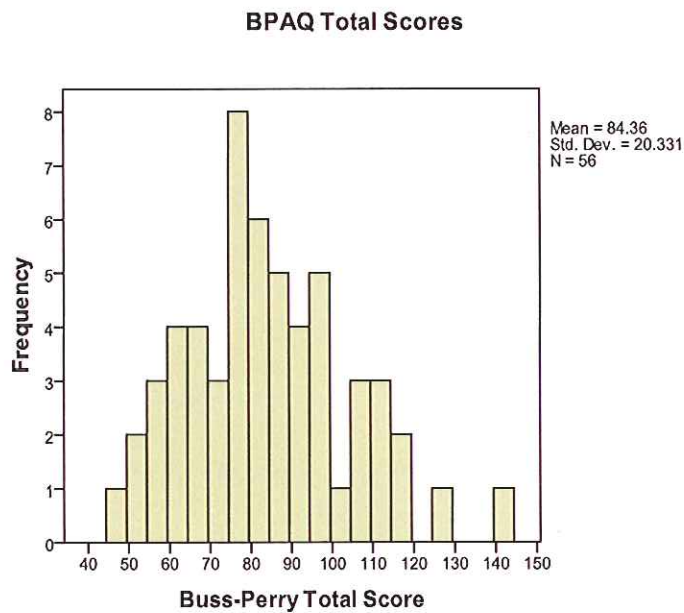


Figure 3. Frequency distribution of the Buss-Perry Aggression Questionnaire scores.

Participants in the present sample showed relatively low trait aggression and wide variability as indicated by the BPAQ (see Table 1), although this score does not

appear to differ markedly from other data derived from college samples (Buss & Perry, 1992).

EFI total and subscale scores are presented in Table 1. The average participant obtained a score of 97.82 for a total score on the EFI, with the lowest possible score being a 27 and highest possible score of 135 (if correctly completed); higher scores on the EFI and its subscales indicate higher functioning in that particular area. The EFI scores indicate the present sample's responses display wide variability in their executive functioning abilities (see Figure 4).

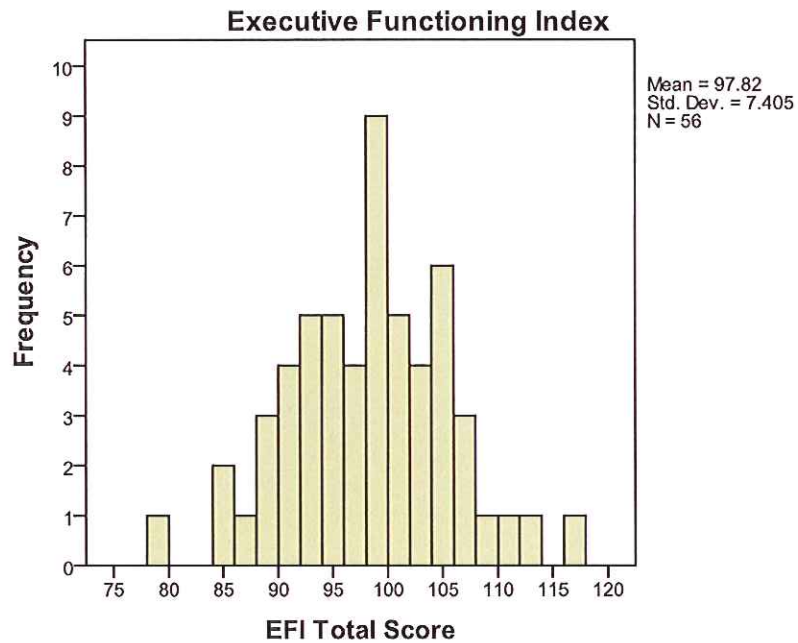


Figure 4. Frequency distribution of the Executive Functioning Index total scores.

Figure 5 displays the mean distribution of the EFI subscale scores for the whole sample (N=56) of subjects, which do not differ markedly from other data derived from community samples (Spinella, 2005).

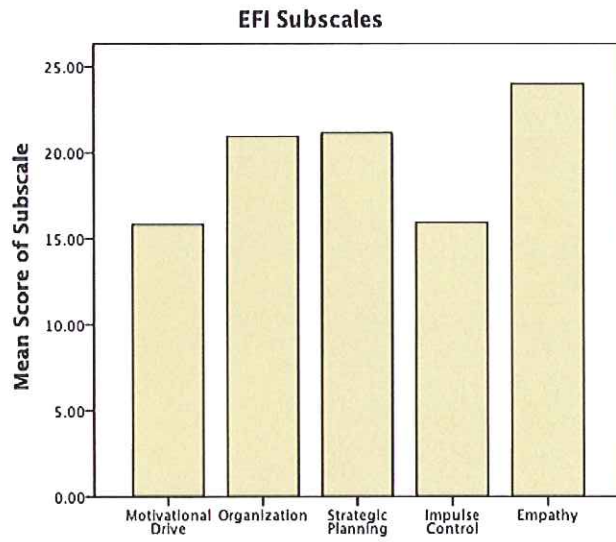


Figure 5. Executive Functioning Index subscale mean scores, N = 56

Average number of days each category was experienced

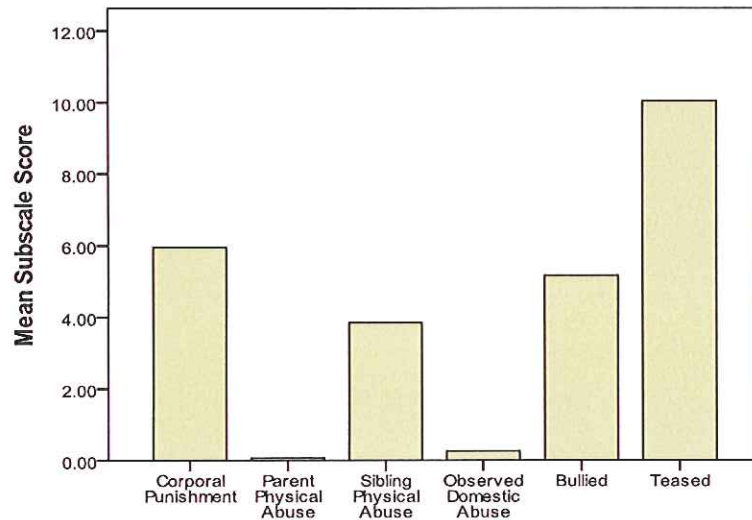


Figure 6. The average amount of days per year over twelve years, subjects reported experiencing or observing violent experiences in each of the VEQ-R subscale, N = 56.

A history of being teased was the subscale most endorsed and reported compared to other violent experience subscales, with the average participant experiencing 10.05 instances of teasing in their childhood and adolescents. Bullied and Corporal punishment were also more prominently endorsed than other experiences of abuse or witnessing domestic violence, see Figure 6.

The TAP dependent measure procedure did appear to be successful in generating fairly wide variability in the extent to which participants were willing to inflict shock on fictitious opponents in a competitive laboratory exercise.

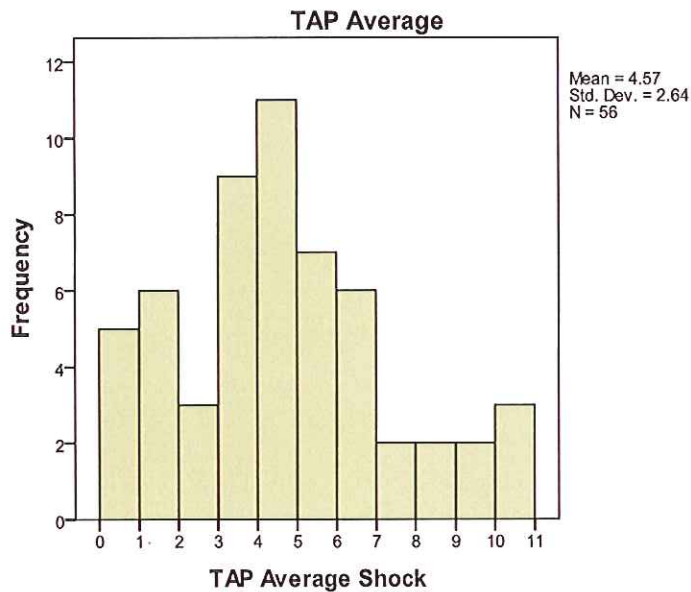


Figure 7. Frequency distribution of Average Shock selected on the TAP.

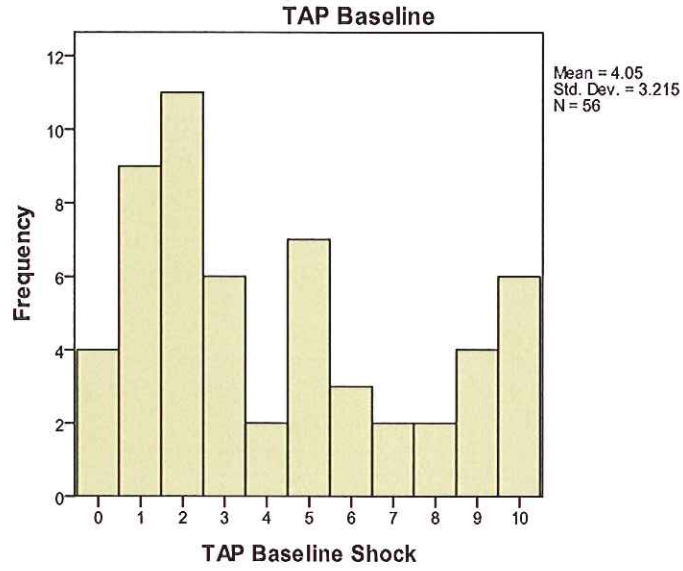


Figure 8. Frequency distribution of average Baseline Shock selected on the TAP.

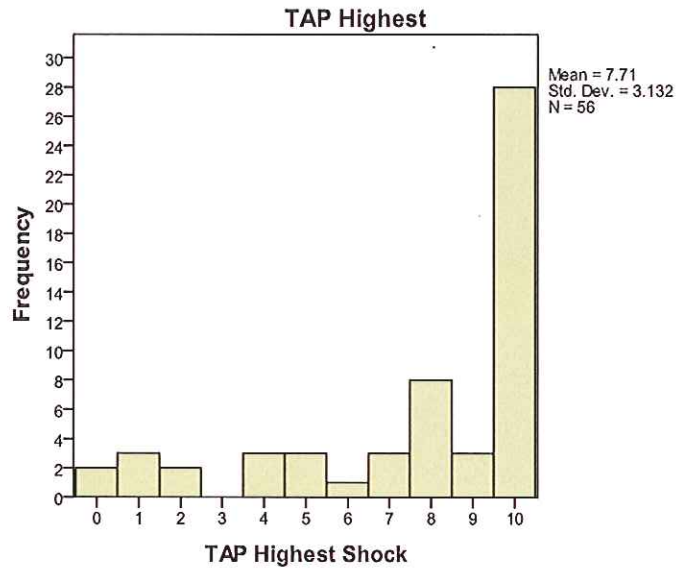


Figure 9. Frequency distribution of the Highest Shock intensity selected throughout the TAP.



It appears in Figure 10 the amount of corporal punishment experienced in childhood by the present sample does not reflect much variability with 84 percent of the participants reporting fewer than 10 instances of corporal punishment in childhood.

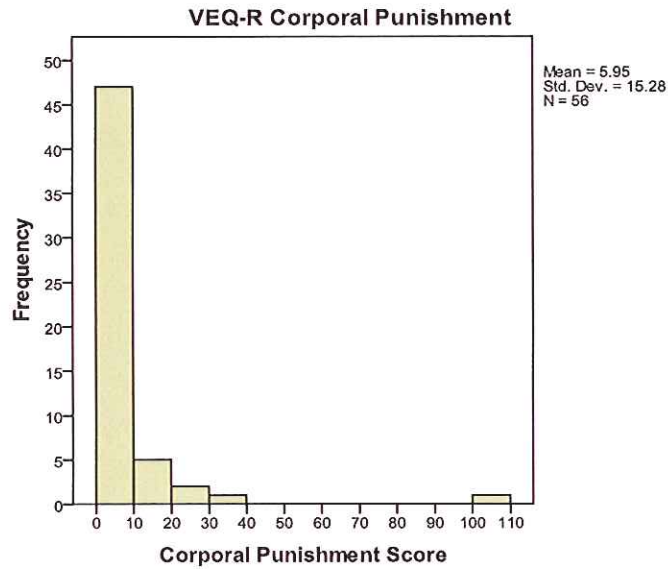


Figure 10. Frequency distribution of the Corporal Punishment subscale scores on the VEQ-R.

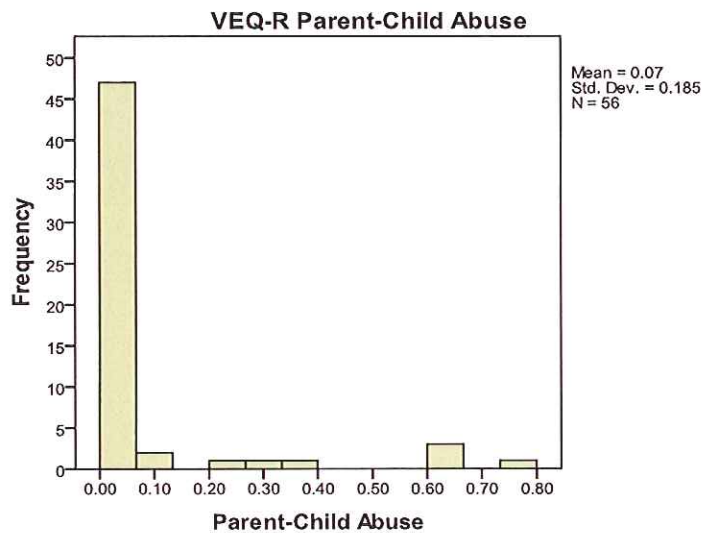


Figure 11. Frequency distribution of the Parent-Child Abuse subscale scores on the VEQ-R.

It appears in Figure 11 there is not much variability in the amount of abuse experienced in childhood with parents being the abuser. Of the present sample there are 84 percent of participants that reported little to no incidence in childhood in which they reported being abused by their parents.

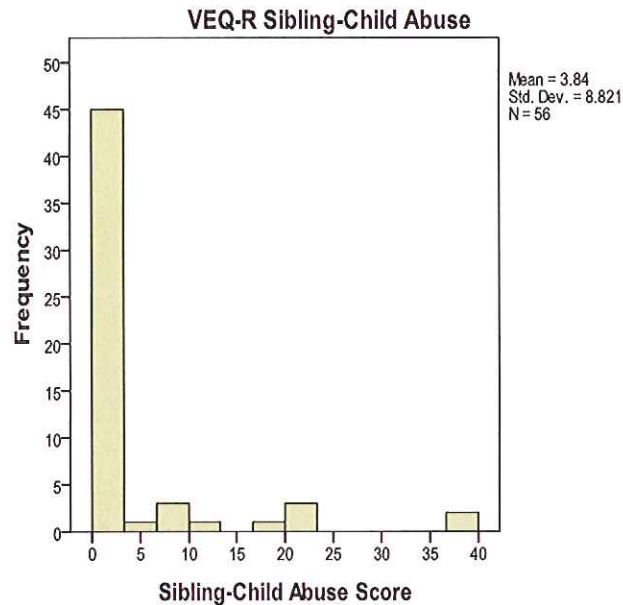


Figure 12. Frequency distribution of the Sibling–Child Abuse subscale scores of the VEQ-R.

It appears the amount of abuse experienced in childhood (Figure 12), in which siblings were the abuser does, not vary largely among the sample. A total of 80 percent of participants reported experiencing no instances of abuse from sibling in childhood.

It is displayed in Figure 13 the present sample reported a relatively low amount of witnessing domestic violence in childhood, and this measure did not appear successful in generating wide variability in the data with 96 percent of the participants reporting they witnessed one or less instances of domestic abuse in childhood.

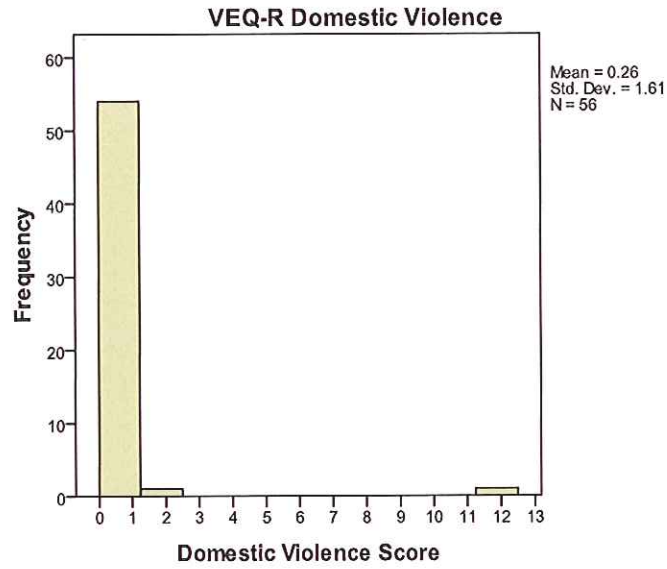


Figure 13. Frequency distribution of the Domestic Violence subscale scores on the VEQ-R.

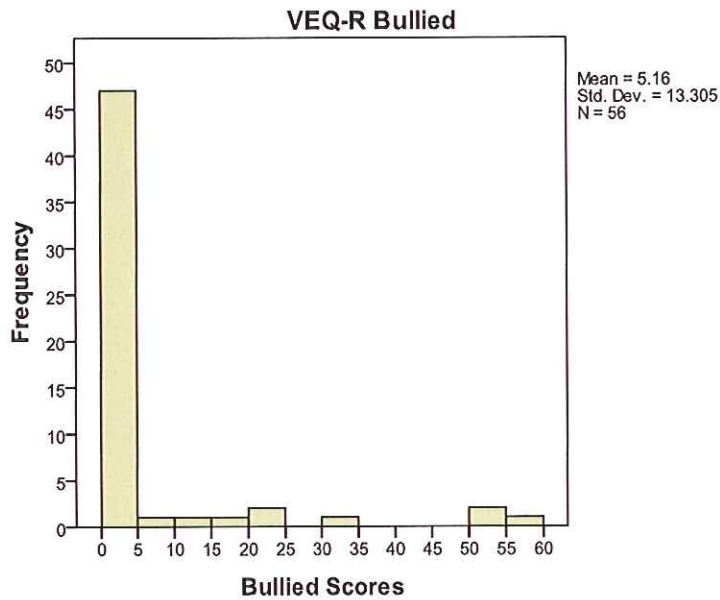


Figure 14. Frequency distribution of the Bullied subscale scores on the VEQ-R.

The participants in the present sample showed evidence of relatively low variability of bullying in childhood (Figure 14) with 84 percent reporting less than 5 instances in which they were bullied, although this score does not appear to differ markedly from data derived from other college samples (Mugge, 2011).

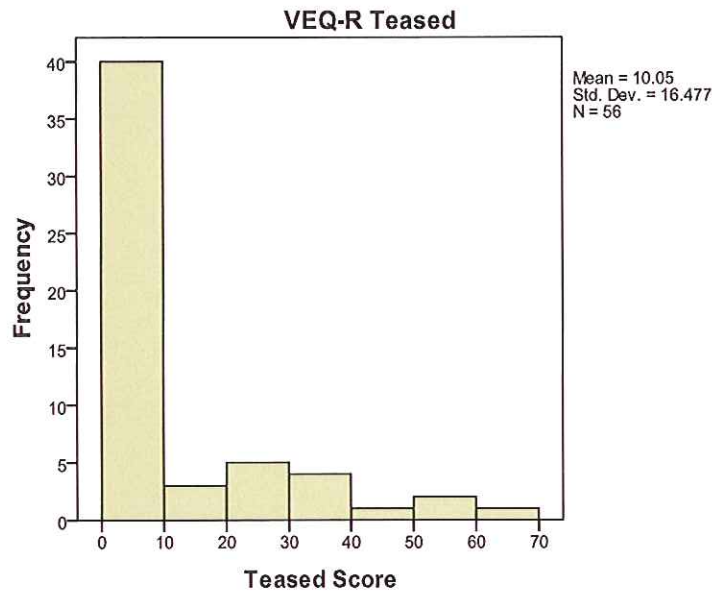


Figure 15. Frequency distribution of the Teased subscale scores of the VEQ-R.

The participants in the present sample showed evidence of relatively low experiences of being teased in childhood (Figure 15); however, there is some variability in the data with 29 percent of the sample reporting ten or more instances of being teased per year during childhood, which is similar to other data derived from other college samples (Mugge, 2011).

#### Correlation Analyses

Table 2 displays the bivariate correlational levels between the Trait Anxiety, EFI, BPAQ, AEQ and the variables summarized in Table 1, which includes all participants ( $N = 56$ ). Trait Anxiety was significantly positively correlated with the

amount one was bullied,  $r = .386$ ,  $n = 56$ ,  $p < .005$ , and teased,  $r = .456$ ,  $n = 56$ ,  $p < .000$ . Trait anxiety is also significantly positively correlated to BPAQ total score,  $r = .322$ ,  $n = 56$ ,  $p < .05$ .

The EFI total scores were significantly negatively correlated with the BPAQ total score,  $r = -.449$ ,  $n = 56$ ,  $p < .001$ , indicating as executive functioning increases the amount of total abuse experienced decreases or vice versa. EFI was also negatively correlated with Bullied,  $r = -.311$ ,  $n = 56$ ,  $p = .02$ , Aggressive Experiences,  $r = -.291$ ,  $n = 56$ ,  $p = .03$ , and Trait Anxiety,  $r = -.337$ ,  $n = 56$ ,  $p = .01$ .

The Buss-Perry physical aggressive subscale is significantly related to amount of past physically violent acts (VEQ),  $r = .357$ ,  $n = 56$ ,  $p < .01$ , impulse control abilities,  $r = -.576$ ,  $p < .000$ , and the amount one was bullied in childhood,  $r = .393$ ,  $n = 56$ ,  $p < .01$  (Table 2).

Locus of Control was significantly negatively correlated with them amount of bullying,  $r = -.371$ ,  $n = 56$ ,  $p < .005$ , and teasing ( $r = -.350$ ,  $n = 56$ ,  $p < .01$ ) participants experienced during childhood and adolescents.

Among the subjects that were deceived by the TAP task ( $N = 45$ ), bivariate correlations were conducted for developmental and dependent variables. Contrary to expectations, average intensity of shock was not significantly correlated with several of the dependent measures (see Table 3).

Highest shock selected was also not significantly correlated with a majority of the dependent measures total scores, but was significantly negatively correlated with the subscale verbal aggression ( $r = -.301$ ,  $n = 45$ ,  $p < .044$ ) on the BPAQ, and Parent Abuse,  $r = -.318$ ,  $n = 45$ ,  $p < .05$ , on the VEQ-R.

Table 2. Correlations among Independent and Outcome Variables for Overall Sample, N=56.

	Age	Ethnicity	Grade	Income	AEO	Corporal Punishment	Bullied	Tesed	Motivational Drive	Organization	Impulse Control	Strategic Planning	Empathy	Total EFI	Trait Anxiety	LOC Total	BP Total	BP Hostility	BP Verbal Aggression	BP Physical Aggression						
Age	1																									
Ethnicity	.356**	1																								
Grade	.373**	-.147	1																							
Income	.231	-.085	.524**	1																						
AEO	-.094	-.1	-.002	.082	1																					
Corporal Punishment	-.008	-.096	-.097	-.106	-.018	1																				
Bullied	.027	.114	-.412**	-.243	-.111	.638**	1																			
Tesed	-.016	.131	.024	-.039	.122	.121	.262	.388**	1																	
Motivational Drive	.054	-.109	.285*	.312*	-.008	.352**	-.229	-.426**	.173	1																
Organization	.374**	.467**	.057	.003	-.273*	-.065	-.269*	.028	-.025	.040	1															
Impulse Control	.004	-.034	.031	.031	-.443**	.128	.035	.005	.091	.213	.184	1														
Strategic Planning	.066	-.061	.018	.097	-.151	-.071	-.45	.074	.211	-.132	.041	.344**	1													
Empathy	.199	.154	.159	.160	-.291*	.165	-.311*	-.245	.491**	.481**	.492**	.675**	.554**	1												
Total EFI	.067	.072	-.074	.135	.119	-.304*	.386**	.465**	-.421**	-.351**	.046	-.304*	.053	.337*	1											
Trait Anxiety	.011	-.018	.361**	.073	-.012	.216	-.371**	-.350**	.248	.332*	.112	.105	-.1	.249	-.418**	1										
LOC Total	-.151	-.331*	-.053	-.006	.357**	-.150	.393**	.161	-.196	-.004	-.576**	-.245	-.167	-.449**	.322*	-.238	1									
BP Total	-.028	-.132	.056	.150	.062	-.269	.568**	.325*	-.335*	-.136	-.230	-.130	-.072	.529**	.619**	-.357**	.627**	1								
BP Hostility	-.028	-.311*	-.021	.170	-.192	.158	.122	.158	-.344**	-.188	-.415**	-.398**	-.219	.107	.270*	-.238	.687**	.546**	1							
BP Anger	-.098	-.373**	.118	.213	.285	.166	.098	-.079	-.092	.0	-.487**	.162	.094	.099	-.076	.097	.531**	.310	.251	1						
Verbal Aggression	-.176	-.171	-.191	-.158	.424**	.083	.133	-.005	.160	.222	-.439**	-.194	.171	.107	-.097	-.054	.754**	.096	.307*	.322*	1					
Physical Aggression																										

Note. \* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.  
 AEO = number of physically aggressive experiences after age 14; Total EFI = Executive Functioning Index total score; Trait Anxiety = sum of 20 trait anxiety items of the STAI; LOC Total = sum of items on Rotter's Locus of Control scale; BPAQ Total = total aggressive tendencies endorsed on the Buss-Perry Aggression Questionnaire; BP anger = sum of the anger subscale of the BPAQ; Verbal Aggression = sum of the verbal aggression subscale of the BPAQ; Physical Aggression = sum of the physical aggression items on the BPAQ.

Table 3. Correlations among Independent and Dependent Variables, with Non-TAP Deceived Participants Excluded, N=45.

	AEO	Corporal Punishment	Parental Discipline	Parent Abuse	Sibling Abuse	Domestic Abuse	Trusted	Empathy	Total EFT	State Anxiety	Trait Anxiety	BP Verbal Aggression	BPAQ Total	LOC Total	Baseline Avg	Average Shock Intensity	Highest Shock	Avg. Shock Duration
AEO	1																	
Corporal Punishment	.087	1																
Parental Discipline	.381**	.298*	1															
Parent Abuse	-.026	.042	.096	1														
Sibling Abuse	.214	.058	.234	.081	1													
Domestic Abuse	-.136	-.056	-.108	-.051	-.071	1												
Trusted	-.222	-.066	-.071	.051	.287	.166	1											
Empathy	-.149	-.140	-.037	.210	.251	.060	.605**	1										
Total EFT	-.177	-.062	-.017	.053	-.077	.350*	-.083	.139	1									
State Anxiety	-.167	.234	.167	-.124	-.086	.148	-.262	.223	.523**	1								
Trait Anxiety	-.110	-.308*	.059	.299*	.294	-.084	-.446**	.521**	.094	.077	.338*	1						
BP Verbal Aggression	.068	-.210	-.039	.213	-.046	-.087	-.107	-.100	-.459**	-.239*	-.620**	.118	1					
BPAQ Total	.116	.287	.101	.033	.003	-.066	-.620**	.043**	.064	-.115	.267	.202	.375**	1				
LOC Total	-.065	.079	.079	-.115	-.043	-.175	.044	-.150	-.131	.013	.013	.026	.026	.228	1			
Baseline Avg	-.030	.010	-.099	-.052	-.044	.029	-.066	-.079	-.104	-.040	-.018	-.103	-.059	.047	.316**	1		
Average Shock Intensity	-.059	-.313	-.318**	-.040	-.100	.132	.100	.093	-.079	-.027	.126	.069	.070	.204	.301**	.314**	1	
Highest Shock	-.057	-.007	-.008	-.115	.157	-.082	-.087	-.095	-.001	.121	.240	-.156	-.128	.052	.563**	.342**	.381	1

Note: \*p < .05, two-tailed. \*\*p < .01, two-tailed.  
 AEO = number of physically aggressive experiences after age 14, Total EFT = sum of Executive Functioning Index score, Trait Anxiety = sum of 20 state anxiety items of the STAI, State Anxiety = sum of 20 state anxiety items of the STAI, BP anger = sum of the anger subscale of the Bus-Perry Aggression Questionnaire, BP verbal aggression = sum of the verbal aggression subscale of the Bus-Perry Aggression Questionnaire, LOC Total = total aggression tendencies endorsed on the Bus-Perry Aggression Questionnaire, TAP Base = average intensity of 2 baseline shocks administered, Avg Shock = average intensity of shocks selected during the 10 TAP trials, High Shock = highest intensity of shock selected during the TAP.

Trait and State Anxiety were correlated with several of the developmental variables (Table 3); however, they were both not significantly correlated with any of the TAP measures. Contrary to expectations, these results suggest that the present sample did not respond in such a way that would suggest there is significant relationship between anxiety and aggression.

In addition to the relationships already described, the LOC total scale was trending toward significance with TAP Low Provocation ( $r = .058, n = 45, p > .05$ ), TAP High Provocation ( $r = .078, n = 45, p > .05$ ), Average Shock ( $r = .067, n = 45, p > .05$ ), and Highest Shock selected ( $r = .085, n = 45, p > .05$ ).

#### Anxiety Manipulation

An initial question in the data analysis was whether or not the anxiety manipulation was effective in significantly elevating participant's heart rate and self-report anxiety ratings. A number of methods can be used to determine these changes; in the current study there were two new variables created to determine change in heart rate (HR). HRchange1, which is the third HR measure that came directly after instruction of the speech task minus participant's baseline HR; HRchange2, is the fourth HR assessed after the speech preparation time or 3 minute wait time (for control subjects) minus participant's baseline HR. Independent-samples t-tests were conducted to compare the change in HR scores for Group 1 (control) and Group 2 (experimental; Table 4). There was no significant difference in change of HRchange1 between the experimental group ( $M = 3.29, SD = 13.28$ ) and the control group,  $M = 3.81, SD = 16.86; t(52) = .126, p = .90$  (Table 4). Another independent-samples t-test was conducted using HRchange2 as the dependent variable. There was not a significant difference of HRchange2 when



looking at the experimental group ( $M = 3.59$ ,  $SD = 12.55$ ) and control group,  $M = 1.76$ ,  $SD = 16.27$ ;  $t(54) = -.47$ ,  $p = .64$ . To create some convergent validity, subjective measures of state anxiety was also collected pre and post anxiety manipulation or wait time; therefore, another variable called STAI change (state anxiety post – state anxiety pre) was created. Another independent-samples t-test was conducted using this new variable. Once again, no significant difference for change of state of anxiety was found when comparing the experimental group ( $M = 1.85$ ,  $SD = 7.29$ ) and the control group,  $M = -.86$ ,  $SD = 6.25$ ;  $t(54) = -1.49$ ,  $p = .14$ . Overall, results suggest that the anxiety manipulation was not successful in significantly increasing participant’s anxiety as assessed by heart rate and self-report. Subsequently, the following inferential statistics excluded the anxiety manipulation factor in these analyses.

Table 4. T-tests Assessing Mean Differences of Changes in HRchange1, HRchange2, and STAI Change, N=56.

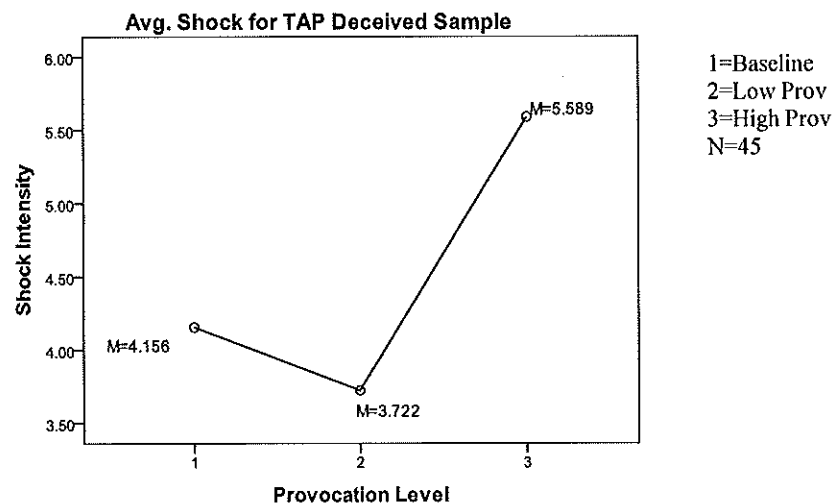
		M	SD	df	t	Sig. (2-tailed)
HR Change 1	Group 1	3.81	16.86	52	.126	.901
	Group 2	3.29	13.2			
HR Change 2	Group 1	1.76	16.27	54	-.470	.641
	Group 2	3.59	12.55			
STAI Change	Group 1	-.86	6.25	54	-1.499	.140
	Group 2	1.85	7.29			

## Inferential Statistics

A series of 2 x 3 mixed subjects ANOVAs were conducted to assess the main and interaction effects between TAP provocation level and selected independent variables (using median splits).

### *TAP Provocation Level*

TAP provocation level was found to be statistically significant in all 7 of these analyses ( $p < .001$  in all cases). A large average effect size was found for the provocation main effect (partial eta squared = .6). Figure 16 illustrates this main effect.



*Figure 16.* Mean shock selection at each level of provocation on the TAP.

Baseline average scores did not differ significantly from the average low provocation scores; interestingly, on average participant's low provocation scores are lower than baseline scores. As expected, aggressive responding varied significantly from baseline to high provocation trials (Figure 16). These results are similar to those found in previous studies (Mugge, 2011; Chermack, Berman, & Taylor, 1997) that

utilize the TAP procedure with different provocation levels, in that the difference from the baseline block to low provocation block does not differ significantly, but the high provocation block differed significantly from low and baseline blocks.

Mean shock intensities (Figure 16) and durations (Figure 17) appear to have changed significantly ( $p < .05$ ) from baseline and low to high provocation. There was a significant main effect for Shock Duration,  $F(2, 43) = 9.90, p < .000$ .

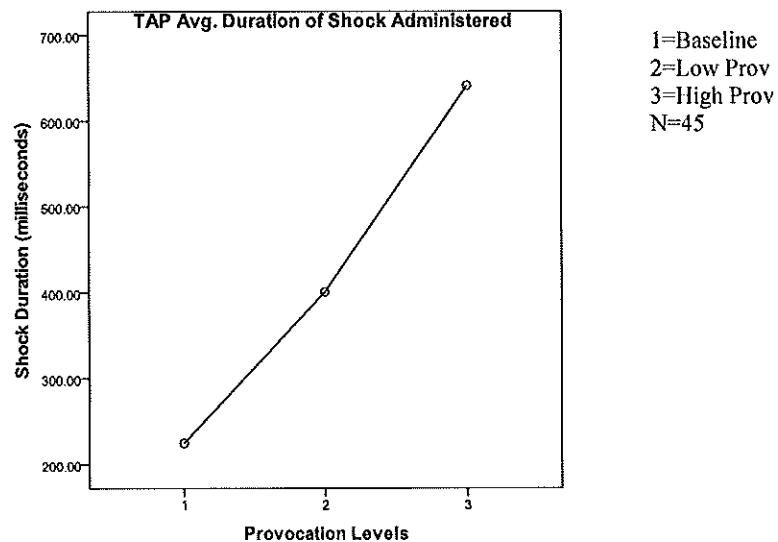


Figure 17. Mean duration of shock selected at each level of provocation on the TAP.

### Trait Anxiety

A mixed 2 x 3 ANOVA was conducted to assess the impact of Trait Anxiety (high and low) on participants' shock intensity selected on the TAP, across the varying levels of provocation (baseline, low, and high). There was no significant interaction between Trait Anxiety and provocation level,  $F(2, 43) = 1.03, p = .37$ . There was a significant main effect for provocation,  $F(2, 43) = 35.70, p < .0005$ , partial eta squared = .63, with both groups (high and low trait anxiety) showing an increase or decrease in

shock intensity across provocation levels. There was not a significant main effect for trait anxiety group,  $F(2, 43) = .161, p = .691$ .

#### *Parental Discord*

Another mixed 2 x 3 ANOVA was conducted instead assessing the impact of Parental Discord (high and low) experienced in childhood has on participant's shock intensity selection on the TAP, across the provocation levels. Again, there was no significant interaction between Parental Discord experienced in childhood and provocation level,  $F(2, 43) = 1.72, p = .19$ , and the main effect for provocation was found to be significant across provocation level ( $F(2,43) = 35.29, p < .0005$ , partial eta squared = .627). There was not a significant main effect for parental discord,  $F(2, 43) = .005, p = .941$ .

#### *Teased*

A mixed 2 x 3 ANOVA was conducted to assess the effect of being teased in childhood (high and low) on participant's shock intensity selection on the TAP, across the provocation levels. There was no significant interaction between Teased and provocation level,  $F(2, 43) = .103, p = .365$ . There was not a significant main effect for Teased,  $F(2,43) = .109, p = .743$ .

#### *Bullied*

Another mixed 2 x 3 ANOVA was conducted to assess the impact of being bullied in childhood on participant's shock intensity selection on the TAP, across the provocation levels. There was no significant interaction between Bullied and provocation level on the TAP,  $F(2, 43) = .38, p = .688$ . There was no significant main

effect for Bullied,  $F(2,43) = 4.034, p = .051$ ; however, it appears to have been trending toward significance.

#### *EFI Total*

A mixed 2 x 3 ANOVA was employed to assess the impact of level of executive functioning on participant's shock intensity selection on the TAP, across provocation levels. There was not a significant interaction found between EFI total score and provocation level,  $F(2, 43) = .55, p = .579$ . There was no significant main effect for high and low Executive Functioning,  $F(2, 43) = 2.77, p = .103$ .

#### *BPAQ Total*

A mixed 2 x 3 ANOVA was employed to assess the impact of Trait Aggression on participant's shock intensity selection on the TAP, across provocation levels. There was no significant interaction between the BPAQ Total score and level of provocation,  $F(2, 43) = .69, p = .505$ . There was no significant main effect for BPAQ total,  $F(2, 43) = .731, p = .397$ .

#### *Locus of Control*

Lastly, another 2 x 3 ANOVA was conducted to assess the impact of Locus of Control (internal and external) on participant's shock intensity selection on the TAP, across provocation levels. There was not a significant interaction found between LOC and provocation level,  $F(2, 43) = .41, p = .669$ . There was no significant main effect for Locus of Control,  $F(2, 43) = .886, p = .352$ .

#### Multiple Regression

A multiple regression was conducted to determine whether the average intensity of shock selected during the TAP may be predicted on the basis of Trait Anxiety,

Executive Functioning (EFI total score), Trait Anger (BPAQ total score), and Locus of Control. Using the enter method, a non-significant model emerged ( $F(4, 39) = 1.25, p > .05$ ). Adjusted  $R$  square =  $-.022$ , Locus of Control emerged as a significant predictor ( $Beta = -.357, p < .05$ ).

A second multiple regression was conducted to determine whether or the average intensity of shock could be predicted on the basis of Bullying, Teasing, and Parent Discord experienced in childhood. These predictors did not produce a significant model:  $F(3, 41) = .248, p > .05$ , Adjusted  $R$  square =  $-.055$ . There were no significant predictors that came out of this model.

#### Anxiety Manipulation Reconsidered

Although state anxiety was not found to be significantly altered statistically by the anxiety manipulation, the possibility was considered that the state anxiety manipulation may have had a residual effect on TAP shock intensity selected. A determination was made that the essential element of a valid test of the state anxiety factor was a subset of participants who had an increase in their state anxiety level, regardless of whether or not the increase was caused by the manipulation. In the current study roughly half of the (deceived) sample ( $N = 20$ ) increased his or her state anxiety. A total of 14 (70%) of this sample who exhibited evidence of elevated state anxiety were actually in the anxiety induction condition. A total of 6 (30 %) participants that were assigned to the anxiety induction manipulation reported a decrease in their state anxiety, and the remaining three participants assigned to the anxiety induction reported no change in their State Anxiety (Figure 18).

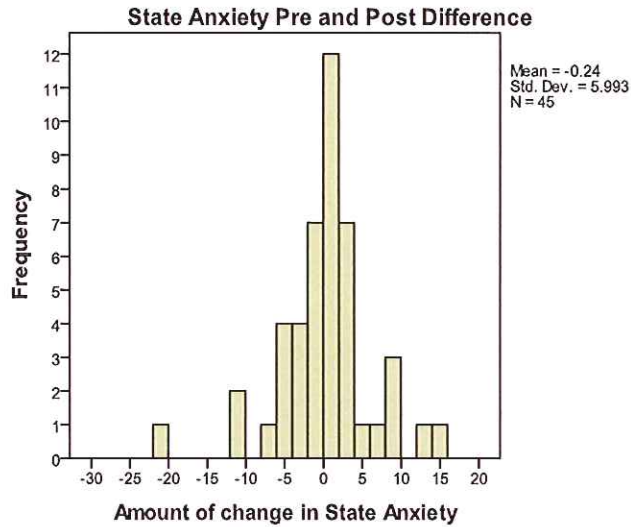


Figure 18. Distribution of change in Pre and Post State Anxiety scores.

A mixed subject 3 (increase, no change, decrease) x 3 (baseline, low provocation, high provocation) repeated measures ANOVA was conducted to assess TAP mean differences in participants that had an increase in STAI scores from pre and post measures compared to those who's STAI score decreased or stayed the same (Figure 19). There was a main effect for provocation ( $F(2, 42) = 6.88, p < .01$ , partial eta squared = .25); however, there was no significant interaction between groups of State Anxiety and levels of provocation,  $F(2, 42) = .393, p = .813$ .

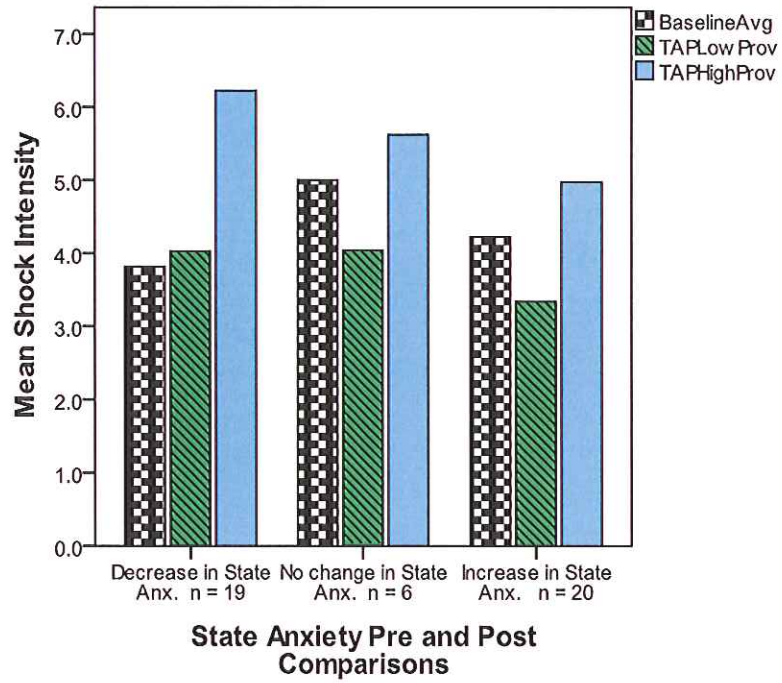


Figure 19. Comparison of the baseline and provocation levels of State Anxiety group, N = 45.



## CHAPTER IV

### DISCUSSION

This study examined the effect of induced anxiety and other risk factors on the aggressive responding of college undergraduate men. It was expected that participants who were made anxious and who were considered “at risk” (i.e. low executive functioning, history of abuse, high trait anxiety, and high trait aggression) would respond more aggressively following provocation than those who were not made anxious. Additionally, it was hypothesized that provocation alone would increase aggression among participants, which would be intensified if also considered “high risk.”

Fifty-six male participants were selected for inclusion in this research study. Of these participants, 27 individuals were in the experimental group and were asked to prepare a speech they thought they were going to deliver in front of a video camera (anxiety induction). After preparation of this speech or identical wait time for control subjects (N = 29) all participants competed in a “reaction time” task that was actually a measure of physical aggression where they believed they were competing against another opponent. Eleven of the participants were not deceived by the TAP (aggression task) procedure and reported they suspected they were not competing against a real “opponent”; to be cautious these non-deceived participants were excluded from analysis pertaining to aspects of the TAP.

Supporting hypotheses, the increase in provocation level on the TAP proved to be successful at eliciting increased aggressiveness in participant's shock selection. The average level of shock administered at each level of provocation and duration in which participants held the shock delivery button increased from baseline to the high provocation block, see Figures 16 and 17. Consistent with previous research mean TAP mean scores at high provocation shock intensity was significantly different from baseline and low provocation mean scores (Mugge, 2011; Chermack, Berman, & Taylor, 1997). In keeping consistent with previous literature showing that provocation is one of the most powerful elicitors of human aggression both in and out of the laboratory (Anderson & Bushman, 1997).

In exploring the descriptive statistics several variable distributions of the present sample proved interesting given their wide variability. Trait and State Anxiety (displayed in Figures 1 and 2) and the BPAQ Total and EFI Total illustrated considerable individual differences for these variables within this college sample. It was unfortunate that some of the developmental variables did not produce a wide variability, therefore, making it unproductive to examine their relationships with the dependent measures. For example, corporal punishment, parent child-abuse, and the amount of witnessing domestic abuse during childhood were not widely distributed throughout the sample. The amount of being bullied and teased were moderately varied among the sample, suggesting some participants reported several instances of being teased or bullied during childhood (Figures 14 and 15). Lack of variability can be due to the relatively small sample size utilized for this study, and a lack of heterogeneity among the sample.

*State Anxiety Considerations.* The anxiety-induction procedure proved only partially successful in achieving clear comparison groups for state anxiety. Although the anxiety induction manipulation did not prove to be effective in significantly increasing the average heart rate or state anxiety of experimental subjects, it was still possible to conduct some analyses on groups of participants who increased or retained (or lowered) their state anxiety after baseline and prior to the low provocation trials of the TAP. Participants who reported an increase in state anxiety as measured by the STAI subscale (due to anxiety induction or not) responded similarly to those participants who did not appear to alter his state anxiety from baseline to the low provocation trials (Figure 19). High or low trait anxiety also did not significantly impact how participants responded on the TAP. Thus, evidence was not found that either state or trait anxiety effected the aggressive responding of this sample of college men under conditions of laboratory provocation. The hypothesis that participants who report adverse childhood experiences would respond more aggressively than those without such experience was not found at either baseline or under conditions of provocation. This finding contradicted other research, which often found baseline differences and even interactions across provocation level. For example, Hyman et al. (2003) found a link between perceived traumatic experiences in childhood and other forms of maladaptive adult behavior. There are also several other studies that provided support for the relationship between childhood physical abuse and adulthood aggression (Chermack & Walton, 1999; Weeks & Widom, 1998). Additionally, a study by Moe, King, and Bailey (2004) indicated that participants who reported experiencing recurrent physical abuse in childhood responded more aggressively following

provocation in the laboratory. Characteristics, histories, and backgrounds of participants included in the current sample are likely not representative of the general population, possibly due to the small sample size.

A negative relationship was found between executive functioning and aggressive traits (BPAQ). Participants who showed evidence of lower executive functioning abilities tended to identify elevations in aggressive tendencies (higher BPAQ total scores). However, the hypothesis that executive functioning deficits would significantly impact actual physical aggression (high TAP score) after provocation was not supported. It is interesting how self-report measures and the laboratory aggression measure (TAP) scores differ in this aspect, as the present study did not demonstrate such a relationship between executive functioning and aggressive responding on the TAP. These findings contradict previous research indicating lower executive functioning is a significant determinant in aggressive behavior (e.g., Giancola & Zeichner, 1994; Moffit, Lynam, & Silva, 1994).

Average shock intensities selected at different provocation levels did not seem to significantly differ between participants with an internal and external Locus of Control. Contradictory findings by Insel et al. (1998) indicated that perceptions of control among Rhesus monkeys affected their aggressive tendencies when they were made to feel anxious.

In summary, the developmental factors and levels of anxiety were expected to impact the aggressiveness of individuals after increased provocation were not supported. As predicted, provocation did significantly increase aggressive responding with this effect not found to interact with a host of other developmental variables.

In summary, this study was one of the first to provide a prospective (rather than retrospective) examination of the links between induced anxiety and laboratory aggression. The present findings supported results by Chermack, Berman, and Taylor (1997) that failed to find an impact of positive or negative emotions on aggressive responding. Provocation level was not found to interact with a range of factors thought to place men at risk for aggressive responding.

### Limitations

This study includes several limitations that should be addressed in future studies addressing similar concepts. First, the present study implemented an anxiety manipulation modeled after a procedure used in Phillips and Giancola (2008); however, the method used in the current study differed in some aspects. Most obvious is that the current study asked participants to prepare a speech about their hometown experience, as opposed to their opinion about their body. Participants in the current study were also allowed to write notes on a note card if they wished, which also differed from the Phillips and Giancola (2008) study and may have alleviated situational anxiety, as opposed to increasing it. A study by Hazlett-Stevens and Borkovec (2001) also used a similar anxiety induction method; however, the participants in this study were categorized into “speech anxious” and “control” groups in the screening process. Also, participants in the present study were informed that they would be giving their speech after other procedures were completed, which may have depleted the immediacy of the speech task, thus not as anxiety provoking. In future research, it may be more effective to use a more universal or widely used form of anxiety inducing procedure or use participants that have already existing state and trait anxiety differences.

The current study was adventurous in that the Kashdan, McKnight, Richey, and Hofmann (2009) study supporting that anxiety and aggression have a positive relationship included participants localized to Social Anxiety Disorder (SAD) and was conducted using participants from the National Comorbidity Survey-Replication dataset, allowing for the ability to be more specific in their selection criteria. Overall, previous research supports more specifically a subset of those with a diagnosis of Social Anxiety Disorder who were aggressive and other anti-social traits, which made it possible to identify heterogeneity in behavior patterns of those with SAD (Kashdan et al., 2009); it is concluded that attempting to parallel state anxiety with Social Anxiety Disorder may be a limitation to the current research as there is no indication the two are synonymous.

Furthermore, Kashdan et al. (2009) having such a large dataset discovered a subset of individuals with anxiety problems that were more risk-prone the individuals were characterized as having less education, household income, general physical health, and had less access to social and economic opportunities (Kashdan et al., 2009). Therefore, simply the sample used in the current study deviates from the original research by only examining college aged males and is another reason future research should recruit a more general sample of participants if examining similar variables. The limited sample size and lack of heterogeneity among the sample could have hindered significant findings. For example, Caucasian participants are more likely to display higher levels of implicit (i.e. shock duration) compared with explicit (i.e. shock intensity) forms of aggression than African Americans, which could have contributed to lack of findings related to average shock selection (Giancola & Zeichner, 1995).

There were some environmental/methodology considerations that could have detracted from the effectiveness of the anxiety manipulation. The laboratory was located on the third fourth floor of the building and required the participants to walk up stairs, which could have increased their baseline HR (despite a 1-2 minute rest period prior to measurement). The heart rate reading apparatus (wrist watch) was not one that was used in previous research assessing HR, and may not have been the most effective in accurately assessing HR. The watch was used for its convenience and non-invasive nature, as opposed to chest bands, which can be complicated and seem more invasive to some. There is also a possibility of societal and cultural influences impacting the effectiveness of the anxiety induction. Today, multi-media and video are much more common in daily life with the increased use of smartphones, Skype, the internet, etc.; therefore, it is possible that even in the 3 short years since the Phillips & Giancola (2008) study there may be some de-sensitization of college aged males to the thought of talking in front of a video recorder.

#### Future Research

Exploring antisocial and aggressive tendencies and their relationship with anxiety was fascinating, due to the complexity of aggression and limited understanding of why some people respond aggressively and others do not. It was fulfilling to explore some of the facets that may contribute to or explain behavior patterns in individuals that are usually considered “difficult to treat” because of their antisocial traits. It seemed from personal experience that anxiety may be a contributing factor in aggressive tendencies and made conducting this research even more intriguing. Due to limitations of the current study and breadth of additional areas that were excluded for feasibility of

this project, future research furthering the exploration of anxiety subtypes and their relationship with aggressive tendencies are possible.

Despite not finding adequate results to support that some individuals who are more vulnerable and made anxious will respond more aggressively than those who are not, there was an unexpected significant factor that could be analyzed in future research. Average duration of holding the shock button was not examined thoroughly, but could be a good predictor of different types of aggression. Duration has been examined in other studies, and has been shown to be a more implicit, subtle, and less direct method of aggression (Carlson, Marcus-Newhall, & Miller, 1989; Giancola & Zeichner, 1995).

Additionally, the present study conceptualized the hypotheses on terms of anxiety attenuating impairments leading to externalizing behavior, but it is possible that externalizing behavior problems lead to existing anxiety problems that have been demonstrated in several child and adolescent studies (Biederman, Faraone, Keenan, Steingard, & Tsuang, 1991; Jensen, Martin, & Cantwell, 1997).

It should be emphasized that this study was not to estimate the likelihood of how many of those with anxiety are aggressive in their presentation, but rather to highlight the fact that there may be some people who suffer from anxiety, but do not display symptoms in a typical way that clinicians expect. It is important to emphasize this point because if diagnosis of symptoms is more accurate, treatment planning and outcomes could improve by having a correctly identified problem.



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