THE VALIDATION OF THE ANGER IMPLICIT ASSOCIATION TEST

A Dissertation

by

RAFAEL CUELLAR, JR.

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree
of

DOCTOR OF PHILOSOPHY

August 2005

Major Subject: Counseling Psychology

THE VALIDATION OF THE ANGER IMPLICIT ASSOCIATION TEST

A Dissertation

by

RAFAEL CUELLAR, JR.

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree
of

DOCTOR OF PHILOSOPHY

Approved by:

Chair of Committee,	Collie W. Conoley
Committee Members,	Dan Brossart
	Linda Castillo
	Lloyd Korhonen
Head of Department,	Michael Benz

August 2005

Major Subject: Counseling Psychology

ABSTRACT

The Validation of the Anger Implicit Association Test. (August 2005)

Rafael Cuellar, Jr., B.A., The University of Texas at Austin;

M.S., Texas A&M University-Kingsville

Chair of Advisory Committee: Dr. Collie W. Conoley

The present study investigated the Anger IAT as a valid measure of anger. In order to answer this question the relationship between the Anger IAT and traditional measures of anger, anxiety, and self esteem were examined for convergent and divergent validity. It was hypothesized that the Anger IAT measure would be moderately to highly correlated with the State Trait Anger Expression Inventory-2 (STAXI-2), correlated less with the State-Trait Anxiety Inventory (STAI), and correlated least with the Rosenberg Self Esteem Scale (RSES). Additionally, to demonstrate that the Anger IAT measure reduces a person's ability to fake good, social desirability is hypothesized to have a moderating effect between the Anger IAT and the STAXI-2.

A total of 60 subjects participated in this investigation, 42 of which were female and 18 were males. Furthermore, there were 20 Caucasian, 34 Hispanic, and 6 African American participants.

It was found that the Anger IAT was correlated with several scales of the STAXI-2. The Anger IAT correlated less with the STAI and least with the RSES. Furthermore, it was found that the Anger IAT measure reduced the participant’s ability to fake good.

DEDICATION

I dedicate this dissertation to my darling daughter

Victoria Camille Cuellar.

May God bless you and always bring you joy and peace.

ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to the following people without whom this endeavor would not have been accomplished.

I extend my gratitude to Collie Conoley for his patience and friendship and for his guidance regarding the computer program used to design the Anger IAT. I also thank Collie for listening and understanding during a difficult time in my life.

I thank Dan Brossart and Linda Castillo for their support, guidance, and humor.

Finally, I would like to thank the most important people in my life, my family.

I thank my sister Nori and niece Lynn for their words of encouragement and gentle and not so gentle prodding as to the completion of the project.

I thank my parents for their unconditional love and faith without which I could not have accomplished this goal.

To my precious daughter, Victoria, I thank her for keeping me real, all the timely hugs, and kisses. I thank you for being such a wonderful daughter and allowing me to

study and write when you would have rather been at the pool.

I thank God for placing all of these people in my path. May God bless all of you.

TABLE OF CONTENTS

CHAPTER Page

Page

LIST OF FIGURES

LIST OF TABLES

TABLE Page

CHAPTER I

INTRODUCTION

Over the last few decades, society has witnessed a plethora of examples of brutality and aggression amongst humans (Aronson, 1995). Examples include the Vietnam War, followed by the bloody civil wars in Central America, the genocides in Bosnia, and Rwanda, acts of terrorism both at home and abroad, gang violence in large urban cities, and the atrocities that occurred in our American schools such as Columbine. The list continues to grow everyday.

Anger: Concepts and Definitions

To date, a definition of anger has been difficult to ascertain because it is so closely related and linked with aggression, hostility, and violence. For example, anger has often been defined as a subjective experience that precludes aggression (Averill, 1982).

Spielberger, Jacobs, Russell, and Crane (1983) noted that although a plethora of research has been conducted on the negative impact of anger and hostility on physical and psychological well-being, definitions of these constructs

---

This dissertation follows the style of *The Journal of Social Psychology.*

have been ambiguous at best. Moreover, according to these authors anger is a simpler concept than hostility or aggression and usually refers to an emotional state that ranges in intensity from irritation and annoyance to fury and rage. Spielberger, Jacobs, Russell, and Crane (1983) also made the distinction that anger and hostility refer to feelings and attitudes; whereas, aggression implies destructive behavior aimed towards persons or objects.

In conclusion the psychological aspects of anger and the behavioral manifestations of aggression have been researched extensively; however, finding one definition for anger is difficult. For the purposes of this study, anger will be defined as an attitude noted by thoughts and feelings that vary from mild irritation to intense fury. The rationale for this operational definition of anger will be discussed in detail in a later section of this manuscript.

Assessment of Anger

Now that anger has been defined the following section will briefly illustrate a number of past attempts at assessing anger. According to Spielberger, Jacobs, Russell, and Crane (1983) the earliest attempts to assess anger were through projective techniques, behavioral

observations, and clinical interviews. Although behavioral ratings and clinical interviews garnered valuable information they are highly subjective and great value is placed on the expertise of the interviewer.

During the 1970's three other measurements of anger emerged: 1) Reaction Inventory, 2) Anger Self-Report, and 3) Anger Inventory (Spielberger, Jacobs, Russell, and Crane, 1983). However, Biaggio, Supplee, and Curtis (1981) found that the aforementioned instruments were confounded with hostility. Moreover, Biaggio (1980) concluded that the validity of the Reaction Inventory, Anger Self-Report, and Anger Inventory were limited.

Given the problems associated with anger in the world and the difficulty defining and measuring anger explicitly, a new method of measuring anger could be of use today. Two such methods of measuring attitudes implicitly will be briefly discussed in the following section that may be of some help with the current dilemma of measuring anger.

Implicit Measures of Attitudes

According to Greenwald and Banaji (1995), measuring implicit social cognition is difficult because by definition they are not accessible through introspection. Therefore, self report measures are not able to adequately

measure social cognitions due to the participant's desire to "look good" or answer in a socially desirable manner. Currently, there are two methods that have been forth to deal with this measurement challenge.

The first method for measuring attitudes and feelings indirectly was introduced by Higgins and King (1981) and Fazio, Powell, and Herr (1983) who demonstrated a successful methodology in accessing attitudes without direct questioning about the attitudes. In both studies a priming technique was utilized that was either applicable or not applicable to the information that would be judged later. The results of these studies demonstrated that priming affected the judgments of individuals only when the primed information was applicable to the material judged. These results revealed that it is possible to access a person's attitude merely by having him or her observe the attitude object.

The second method for measuring attitudes and feelings indirectly is through the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). This was the approach used in the current study. The IAT was developed as a tool for assessing implicit attitudes indirectly. According to Greenwald et al. the IAT requires the participant to

respond to four types of words while only using two response keys. The specific process has been described later in the study.

The strength of both models is that it allows one to go beyond the use of self-report instruments and assess unconscious attitudes. Although both of these methods have proven to be effective, effect size comparisons between the priming method and the IAT demonstrated that the IAT method has twice the priming method's sensitivity to evaluative differences (Greenwald et al., 1998). This is important because it allows for greater accuracy.

Greenwald and Banaji (1995) operationally defined implicit attitudes as "introspectively unidentifiable (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects." They further stated that implicit attitudes are automatically activated and therefore similar to cognitive priming procedures developed for measuring automatic affect or attitude (e.g. Bargh, Chaiken, Govender, & Pratto, 1992; Fazio, 1993; Greenwald, Klinger, & Liu, 1989; Perdue, Dovidio, Gurtman, & Tyler, 1990; Perdue & Gurtman, 1990). Moreover, Greenwald and Banaji (1995) asserted that the IAT is effective in

assessing automatic association even when an individual would prefer not to have this association. Therefore for the purposes of this study, anger will be operationally defined as an attitude noted by thoughts ad feelings that range from mild irritation to intense fury.

According to Greenwald et al. (1998) the IAT measures the differential association of two target concepts with an evaluative attribute. In their study, three experiments were conducted and the overall purpose was to determine the IAT's usefulness as a measure of evaluative associations that underlie implicit attitudes.

The first experiment paired target concepts with evaluative associations that were expected to be strong enough to be automatically activated and highly similar across individuals. The subjects in this experiment responded to two target concepts: (a) flower names vs. insect names and (b) musical instrument names vs. weapon names. These target concepts were paired with pleasant meaning words and unpleasant meaning words. The expectation was that the IAT procedure would reveal superior performance for combinations that were compatible than the ones that were incompatible. The results supported the hypothesized relationship.

The second experiment attempted to discriminate differences between Japanese Americans and Korean Americans in regard to their evaluative associations to Japanese and Korean ethnic groups. Furthermore, explicit measures were used to validate the IAT's results. The hypothesis was that the Korean subjects would be slower in performing the Japanese + pleasant combination than the Korean + pleasant combination. It was also hypothesized that the Japanese subjects would be slower in performing the Korean + pleasant combination than the Japanese + pleasant combination. These patterns were found to be true.

The purpose of the third experiment was to determine if the IAT could measure an implicit attitude that might not be found through a self-report measure. The author's hypothesized that the white subjects would display an implicit attitude difference between white and black categories. The results demonstrated that the white subjects responded faster to the white + pleasant combination than the black + pleasant combination. Five explicit measures were completed by the subjects and compared with the results of the IAT. It was verified that the IAT and explicit measures were weakly correlated. Greenwald et al. (1998) commented that White Americans may

not have a negative association to African Americans but rather it could be that the White Americans are simply not familiar with African Americans so that there would be no opinions.

The results of the three experiments conducted by Greenwald et al. (1998) were consistent with the author's hypothesis that the IAT is sensitive to the automatic evaluative associations. Furthermore, Greenwald, Banaji, Rudman, Farnham, Nosek and Mellott (2002), stated that the problem with self-report measures lay with a subject's ability to report private thoughts and feelings inaccurately. Therefore, by utilizing the IAT one can determine the attitude of subjects without the concern of the subject skewing responses in a socially desirable manner.

Statement of Problem

Anger has been assessed through behavioral observations, clinical interviews, projective techniques, and a number of explicit measures as noted in the previous section. None of these techniques assesses anger both implicitly and quantitatively. The purpose of the following study is to develop a measure of anger that is capable of measuring anger implicitly and quantitatively. A

quantitative implicit measure of anger would be helpful because it does not require a participant to provide self-knowledge about their anger or their willingness to be open and honest about reporting their anger.

Purpose of Study

The purpose of this study was to develop and investigate the validity of an implicit association test (IAT) measure of anger. This purpose is important because anger is a psychological construct that has significant implications to nearly every person in everyday life. Increasing our ability to measure anger has the potential to open areas of research that are not presently available. Although many instruments have been developed to measure anger, there is not a measure of anger currently available that measures anger implicitly. The ability to measure anger implicitly is important because it provides an avenue to the underlying emotions of an individual. Furthermore, by tapping these underlying or unconscious emotions one can measure anger without the possibility of an individual answering in a social desirable manner or “faking good.” The following research has put forth such a test.

Research Question

This study sought to test the validity of an IAT measure of anger. In order to answer this question the following study applied Hepner, Kivlighan, and Wampold's (1992) method for establishing construct validity. Heppner, Kivlighan, and Wampold (1992) stated that construct validity is difficult to determine; however, one way to establish it is by examining the relationships between the scores on an instrument and that of another instrument intended to measure the same construct as well as other instruments intended to measure different constructs. Furthermore, the authors stated that a pattern should emerge with a stronger association between the instruments that measure related constructs and weaker associations existing between instruments that measure different constructs.

Therefore, it would be expected that the Anger IAT would be correlated with the State-Trait Anger Expression Inventory-2, little or no correlation with the State-Trait Anxiety Inventory, and no correlation with the Rosenberg Self-Esteem Scale. Furthermore, when controlling for social desirability the correlation between the Anger IAT and the State Trait Anger Expression Inventory-2 will increase.

Organization of Study

The present work is organized into five chapters. Chapter I provides an introduction to the definition anger, anger assessment, and a new method to assess anger. Chapter II provides a comprehensive review of the literature relevant to the subject of anger, assessment of anger, anxiety, automatic activation of attitudes, and the implicit association test. Chapter III describes the methodology utilized in the present study. Chapter IV presents the results of the data analysis. Last, Chapter V discusses the results and their practical implications.

CHAPTER II

PROBLEM

Can angry attitudes be more accurately measured with new technology than the existing measures? More precisely, this study will attempt to answer the following question. Is the Anger Implicit Association Test a valid measure of anger? The reason this is an important question is because to date there is not a measure of anger using an implicit and quantitative method. The following study will attempt to develop a measurement of anger which can address the shortcomings of past measurements of anger. However, before describing this study, a review of the literature on anger, assessment of anger, anxiety, automatic activation of attitudes, the Implicit Association Test, the validity of the Implicit Association Test, and attitude studies will be undertaken. The chapter ends with the purpose of the study and the hypothesis

Anger: Concepts and Definitions

To date, a definition of anger has been difficult to ascertain because it is so closely related and linked with aggression, hostility, and violence. For example, anger has often been defined as a subjective experience that

precludes aggression (Averill, 1982). He also stated that anger has been defined as a physiological arousal or as an intervening variable for aggressive acts. Averill (1982) defined anger as an emotional syndrome whereby its purpose is to inflict pain or cause harm. According to Averill (1982), anger has been a topic of considerable study. Great thinkers of their time have attempted to define anger including Plato, Aristotle, Seneca, Lactantius, Aquinas, and Descartes. For example, Aquinas defined anger as “a judgment by which punishment is inflicted upon sin” (as cited in Averill, 1982).

Spielberger, Jacobs, Russell, and Crane (1983) noted that although a plethora of research has been conducted on the negative impact of anger and hostility on physical and psychological well-being, definitions of these constructs have been ambiguous at best. Moreover, according to Spielberger, Jacobs, Russell, and Crane anger is a simpler concept than hostility or aggression and usually refers to an emotional state that ranges in intensity from irritation and annoyance to fury and rage. Spielberger, Jacobs, Russell, and Crane also made the distinction that anger and hostility refer to feelings and attitudes; whereas,

aggression implies destructive behavior aimed towards persons or objects.

In conclusion the psychological aspects of anger and hostility and the behavioral manifestations of aggression have been considered extensively; however, as one can see it is difficult to find one definition for anger. For the purposes of this study anger will be defined as an attitude noted by thoughts and feelings that vary from mild irritation to intense fury. The rationale for this operational definition of anger will be discussed in detail in a later section of this manuscript. Therefore, implicit anger will be operationally defined as an unconscious or introspectively unidentifiable thought and feeling towards an object.

Assessment of Anger

The following section will briefly illustrate a number of past attempts at assessing anger. According to Spielberger, Jacobs, Russell, and Crane (1983) the earliest attempts to assess anger were through projective techniques, behavioral observations, and clinical interviews. Although behavioral ratings and clinical interviews garnered valuable information they are highly

subjective and great value is placed on the expertise of the interviewer.

Projective techniques, such as the Rorschach and the Thematic Apperception Test were widely used to assess anger during the 1950's and 1960's (Spielberger, Jacobs, Russell, & Crane, 1983). Although the authors acknowledged that these measures showed promise, they concluded that they are time consuming, scoring is difficult and subjective, reliability is low, and there is not a substantial evidence of their validity.

During the 1970's three other measurements of anger emerged: 1) Reaction Inventory, 2) Anger Self-Report, and 3) Anger Inventory (Spielberger, Jacobs, Russell, and Crane, 1983). However, Biaggio, Supplee, and Curtis (1981) found that the aforementioned instruments were confounded with hostility. The correlations between the Reaction Inventory and the Buss-Durkee Hostility Inventory were r= .52 and .57. The authors concluded that the validity of the Reaction Inventory, Anger Self-Report, and Anger Inventory were limited. Spielberger, Jacobs, Russell, and Crane (1983) concluded that the aforementioned measures of anger confounded the experience of anger with situational determinants of angry reactions. Clearly the consensus on

the current science of measuring anger has found the measures in need of improvement.

In 1971 Evans and Strangeland developed the Reaction Inventory to assess the amount of anger reaction evoked by a specific stimulus situation. The inventory consisted of 76 items that subjects were to read and rate on a five point scale ranging from “not at all” to “very much.”

In 1983 Spielberger discussed the Anger Self-Report. The author described the Anger Self-Report as a 64-item questionnaire used to assess angry feelings and the expression of anger. It is comprised of the following seven subscales: 1. awareness of anger, 2. general expression of anger, 3. physical expression of anger, 4. verbal expression of anger, 5. guilt, 6. condemnation of anger, and 7. mistrust.

According to Spielberger (1983) the Anger Self-Report predictive and construct validity has not been firmly established. Furthermore the author notes that the inventory has not been frequently used by other investigators.

In 1975 Novaco developed the Anger Inventory to assess the extent to which varying situations evoke anger reactions. The original form consisted of 90 anger

provoking statements. The statements were derived during interviews with college students that focused on events that had produced angry reactions. After reading each statement the subject responds to a five point Likert scale ranging from “not at all” to “very much.”

The State-Trait Anger Expression Inventory-2 (Spielberger, 1996) is a self-report measure of anger that is the most used measure in the psychology literature. The State-Trait Anger Expression Inventory-2 views anger as a complex variable which adds to the richness of the measure. However, Spielberger’s inventory shares the shortcoming of the other self-report measures of anger in that a person must be self-aware of the angry feelings and be willing to accurately share the awareness. The measure will be discussed in depth in Chapter 3 of this study. It was one of the measurements used to determine the validity of the Implicit Association Test.

Anxiety

This section will briefly discuss the construct of anxiety. It was included because anxiety will be used to validate the Implicit Association Test. The measure of anxiety used in this study will be discussed in detail in chapter 3.

Another construct used in this study was anxiety. Anxiety was included in the study because it has been a well-researched construct that is considered distinct and yet has overlapping properties with anger. Over the years there have been numerous attempts to clearly conceptualize anxiety. The following section provides a review of some of the attempts, which have been undertaken.

Delprato and McGlynn (1984) stated that anxiety had four common definitions. First, anxiety was described as a trans-situational personality trait. For example, “Lynn is anxious.” Second, anxiety may refer to a transient and situational specific response. An example of this is, “Lynn is anxious when speaking in public.” Third, anxiety may be described as an affective experience. For example, “Lynn feels anxious.” Finally, anxiety may act as a descriptor of a behavior. For example, “Lynn studied the material because she was anxious about failing.”

Bellack and Lombardo (1984) observed that anxiety has been described as a stable characteristic of personality or is predictable characteristic in a specific stimulus situation. According to Sarbin (1964), Freud differentiated between objective and neurotic anxiety. Objective anxiety was defined as a response to a realistic

threat; whereas, neurotic anxiety was defined as an irrational response to an internal conflict.

Another definition of anxiety was provided by Bellack and Lombardo (1984) who defined anxiety as a set of responses involving a combination of cognitive and physiological reactions. Moreover, the authors stated that anxiety is elicited by an identifiable stimulus.

According to Spielberger, Gorsuch, Lushene, Vagg, and Jacobs (1983) the twentieth century has been called the age of anxiety. Furthermore the authors stated that only since the 1950's has anxiety been an area of research. This was primarily due to the ambiguity of conceptualizing anxiety and the lack of appropriate instruments to measure anxiety. However, the authors reported that in the 1950'5 research on anxiety increased because it was defined theoretically and a number of scales were created to measure the construct.

Although there have been a number of definitions of anxiety, the current study will use the state-trait anxiety constructs set forth by Spielberger (1966). Spielberger's State-Trait Anxiety will be used in this study because it is currently the most frequently used and cited measurement of anxiety. Spielberger (1966) stated that anxiety refers

to two distinct but related concepts. First, anxiety is used to describe an unpleasant emotional state characterized by subjective feelings of tension, apprehension, nervousness, and worry. Second, anxiety is used to describe stable individual differences of anxiety proneness as a personality trait.

As stated previously, anxiety has been correlated with anger in past studies. Although the correlations were small it appears that anger and anxiety may have some unspecified similar properties. In 1983, Spielberger, Gorsuch, Lushene, Vagg, and Jacobs demonstrated the associations between the State-Trait Anxiety Inventory and Personality measures. The association between the State-Trait Anxiety Inventory and the aggression subscale on Jackson's Personality Research Form and the aggression subscale on the Edwards Personality Preference Schedule were .34 and .247, respectively.

Self-Esteem

Self-Esteem was also included in the present study. Self-esteem is a well-known construct that has been researched extensively. During the 1960's the fields of psychiatry, psychology and sociology became interested in the nature of self-concept (Rosenberg, 1965). Self-esteem

is one aspect of self-concept and was defined by Rosenberg as an individual's sense of his or her own worth. Since this is the most broad and widely cited definition of self-esteem this definition will be used for the current study. For the purposes of the current study it was hypothesized that self-esteem would have little to no correlation with anger which has been the case historically.

Automatic Activation of Attitudes

During the seventies and early eighties, social psychology had shown an increased interest in the attitude behavior relationship. Fazio, Powell, and Herr (1983) stated that the renewed interest was partly due to the reviews of literature, which questioned whether attitudes are predictive of future behavior. Furthermore, Fazio et al. (1983) stated that researchers attempted to identify moderators of the attitude–behavior relationship that might clarify when attitudes predict behavior. As a result of this effort many situational variables (Ajzen & Fishbein, 1973; Schofield, 1975; Warner & De Fleur, 1969,) personality factors (Zanna, Olsen, & Fazio, 1980) and attitudinal qualities (Fazio & Zanna, 1978) have been researched. The next step in the research agenda was the investigation of the process of how attitude affected

behavior (Fazio et al., 1983). Therefore, process research was designed to shed light on how and why variables affect the attitude-behavior relationship.

According to Fazio et al. (1983) the first step in developing a process model of the attitude-behavior relationship lay in attitude accessibility from memory. Attitude accessibility was operationally defined as the ease of the process by which an attitude can be retrieved from memory upon observation of the stimulus object. The authors further stated that only when the attitude is activated and salient can it be influential on the ensuing behavior. Therefore, Fazio views the concept of attitude accessibility as the key to understanding the process by which attitudes guide behavior.

Fazio, Chen, McDonel, and Sherman (1982) suggested that one possibility of understanding attitude accessibility could possibly lay in the very definition of attitude. An attitude is the association between an object and the evaluation of the object by a person (Fazio, et al, 1982). The object-evaluation association varies in strength and this strength was found to be a determinant of the accessibility of the attitude from memory. Therefore, if there is a strong attitude association with an object,

the evaluation of the object will be accessed more easily. However, if the association is weak it will be more difficult to access the evaluation.

Two experiments by Fazio et al. (1982) demonstrated this object-evaluation relationship. The first experiment examined whether attitudes formed on the basis of a direct behavioral experience were more accessible than attitudes formed on the basis of an indirect experience. Twenty-one subjects were exposed to intellectual puzzles in a direct, behavioral format versus an indirect, non-behavioral format. The subjects were told that the experiment would involve the measurement of their attitudes toward five intellectual puzzles that would be presented through a videotape unit. The participants viewed other individuals working on each type of puzzle. The subjects who were in the indirect condition were told to view the videotape and were explicitly told not to attempt to work out the problems. The subjects in the direct condition were told to view the videotape as well as work out the puzzles simultaneously. The subjects then participated in a response-time task in which they decided whether an adjective was descriptive of their attitude towards a given intellectual puzzle. The subjects were induced to

repeatedly report their evaluations of the puzzles. Attitude accessibility was measured through response times to inquiries about their attitudes towards the intellectual puzzles. The subjects were presented with a number of slides followed by an evaluative adjective that the subjects had to respond to. The subject's task was to press a key marked "yes" or "no" depending on whether they felt the adjective was descriptive of the intellectual puzzle. The subjects in the direct condition responded significantly faster than the non-direct condition (Fazio et al., 1982). In other words, when individuals form an attitude based on a direct, behavioral task they will react more quickly than if the experience is indirect and non-behavioral.

The second experiment by Fazio et al. (1982) employed seventy-nine subjects who received either an indirect or direct experience with intellectual puzzles. The subjects were then asked to rate the interest value of each puzzle on an eleven point Likert scale. The subjects in the repeated expression condition completed the attitude scaling an additional two times. Finally, subjects participated in a "free-play" exercise that consisted of three different pages of each type of intellectual puzzle.

When the subjects completed this task they filled out an interest value for each type of puzzle. The results showed that when the subjects were provided with a “free-play” opportunity in which they could work with any of the puzzles they had earlier evaluated, the subjects in the repeated expression condition were more consistent in their reported interest and their actual behavior toward puzzle types than their counterparts in the single-expression condition. This finding is consistent with what one would expect in the attitude to behavior process (Fazio et al., 1983); that is, greater contact with the object allows an increase in the attitude association

Fazio et al. (1983) reported that “these two experiments provide us with some confidence concerning the utility of a conceptual framework that views attitudes as object-evaluation associations and that emphasizes the strength of this association as a key determinant of attitude accessibility.” In summary if there is a strong association between an object and the ensuing evaluation then the attitude is accessed more easily.

Fazio et al.’s (1982, 1983) and Fazio and Zanna (1981) examination of the attitude-behavior relationship furthered the understanding of how specific variables affect the

degree to which an attitude influences a behavior. Fazio et al. (1982) and Fazio and Zanna (1981) found that attitudes based upon direct, behavioral experience rather that indirect, non-behavioral experience displayed greater consistency between their reported interest and actual behavior toward puzzle types. Fazio et al. (1982 & 1983) and Fazio and Zanna (1981) proclaimed that behavior towards an object is a reflection of a person's evaluation of that object. In summary, attitude accessibility has been shown to serve a key role in how attitudes affect behavior. Moreover, Fazio demonstrated that if a variable strengthens the object-evaluation association then the process has an impact on attitude accessibility as well as on the attitude-behavior consistency. Fazio et al.'s (1983) next step was to arrive at a methodology that would allow one to draw conclusions about attitude accessibility without directly questioning the individuals about their attitudes.

The studies by Higgins and King (1981) and Fazio et al. (1983) demonstrated a successful methodology in accessing attitudes without direct questioning about the attitudes. In both studies a priming technique was utilized that was either applicable or not applicable to the information that would be judged later. The results of

these studies demonstrated that priming affected the judgments of individuals only when the primed information was applicable to the material judged. These results revealed that it is possible to access a person's attitude merely by having him or her observe the attitude object. In a related study by Fazio, Jackson, Dunton, and Williams (1995) a priming technique was utilized to access the extent to which the presentation of an attitude object automatically activates an associated evaluation from memory. The results provided corroboration for Fazio's (1990) spontaneous attitude-to-behavior process, specifically, that evaluations are activated automatically from memory.

Greenwald, McGhee, & Schwartz (1998) have also developed an indirect method of assessing judgment latencies for tasks designed to be facilitated or inhibited by respondent's attitudes. They found that attitude consistent judgments are performed faster than attitude inconsistent judgments because they are relatively automatic. This method is important because it does not depend on a participant's ability or willingness to report their attitudes, especially when these attitudes are not socially acceptable. Rather the automatic activation of an

attitude either inhibits or facilitates the respondent's ability on a subsequent person perception task, affecting the speed and accuracy of the respondent's decision making (Fazio, 1995).

Implicit Association Test

The Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) was developed as a tool for assessing implicit attitudes indirectly. The attractiveness of this model is that it goes beyond the use of self-reports instruments and assesses unconscious attitudes. Although both methods have proven to be effective, effect size comparisons between the priming method and the IAT demonstrated that the IAT method has twice the priming method's sensitivity to evaluative differences (Greenwald et al., 1998). This is important because it allows for greater accuracy.

Greenwald and Banaji (1995) operationally defined implicit attitudes as "introspectively unidentifiable (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects." They further stated that implicit attitudes are automatically activated and therefore similar to cognitive priming procedures developed

for measuring automatic affect or attitude (e.g. Bargh, Chaiken, Govendi, & Pattro, 1992; Fazio, 1993; Greenwald, Klinger, & Liu, 1989; Perdue, Dovidio, Gurtman, & Tyler, 1990; Perdue & Gurtman, 1990). Moreover, Greenwald and Banaji (1995) asserted that the IAT is effective in assessing automatic association even when an individual would prefer not to have this association.

According to Greenwald et al. (1998) the IAT measures the differential association of two target concepts with an evaluative attribute. In their study, three experiments were conducted and the overall purpose was to determine the IAT's usefulness as a measure of evaluative associations that underlie implicit attitudes.

The first experiment paired target concepts with evaluative associations that were expected to be strong enough to be automatically activated and highly similar across individuals. The subjects in this experiment responded to two target concepts: (a) flower names vs. insect names and (b) musical instrument names vs. weapon names. These target concepts were paired with pleasant meaning words and unpleasant meaning words. The expectation was that the IAT procedure would reveal superior performance for combinations that were compatible

than the ones that were incompatible. The results supported the hypothesized relationship.

The second experiment attempted to discriminate differences between Japanese Americans and Korean Americans in regard to their evaluative associations to Japanese and Korean ethnic groups. Furthermore, explicit measures were used to bolster the IAT's results. The hypothesis was that the Korean subjects would be slower in performing the Japanese + pleasant combination than the Korean + pleasant combination. It was also hypothesized that the Japanese subjects would be slower in performing the Korean + pleasant combination than the Japanese + pleasant combination. These patterns were found to be true.

The purpose of the third experiment was to determine if the IAT could measure an implicit attitude that might not be found through a self-report measure. The author's hypothesized that the white subjects would display an implicit attitude difference between white and black categories. The results demonstrated that the white subjects responded faster to the white + pleasant combination than the black + pleasant combination. Five explicit measures were completed by the subjects and compared with the results of the IAT. It was verified that

the IAT and explicit measures were weakly correlated. Greenwald et al. (1998) commented that White Americans may not have a negative association to African Americans but rather it could be that the White Americans are simply not familiar with African Americans so that there would be no opinions.

The results of the three experiments conducted by Greenwald et al. (1998) were consistent with the author's hypothesis that the IAT is sensitive to the automatic evaluative associations. Furthermore, Greenwald, Banaji, Rudman, Farnham, Nosek and Mellott (2002), stated that the problem with self-report measures lay with a subject's ability to report private thoughts and feelings inaccurately. Therefore, by utilizing the IAT one can determine the attitude of subjects without the concern of the subject skewing responses in a socially desirable manner.

The Validity of the IAT

In 2001, Greenwald and Nosek investigated the validity of the IAT by demonstrating internal validity, convergent validity, discriminant validity, and predictive validity. The studies used to demonstrate the validity of the IAT have all been discussed in previous sections of this

chapter. The following section will briefly discuss the results of these studies. Internal validity was demonstrated by Greenwald et al. in 1998. The authors stated that the IAT effect was uninfluenced by whether the pleasant category was placed on the right hand or the left hand, by whether the categories contained twenty-five items or five items, and by whether the response to stimulus intervals ranged from 150 to 750 milliseconds. The author concluded that the aforementioned were all indications of internal validity. One influence that was found to affect internal validity was the order of administration of the IAT tasks (i.e., steps 3 and steps 5). The performance of either of these tasks tends to be faster in step 3 than in step 5. This procedural effect has been corrected by counterbalancing the order of these two tasks.

In order to test for convergent validity IATs were correlated with affective priming procedures introduced by Fazio, Sanbonmatsu, Powell, and Kardes (1986). Cunningham, Preacher, and Banaji (2002) reported the relationship between parallel IAT attitudes and affective priming measures. The result was a correlation of r = .55 between the two methods.

While investigating discriminant validity, Greenwald et al. (1998) found correlations between IAT and self report measure to be weakly positive. A total of 16 correlations demonstrating discriminant validity resulted in an average correlation of r = .25. Greenwald and Nosek concluded that there are three possible interpretations as to why implicit-explicit correlations are reduced: 1. self reports are inaccurate when subjects are dealing with politically sensitive criterion, 2. poor introspective access to attitudes, and 3. homogeneity of attitudes.

Predictive validity has been demonstrated by Greenwald et al. (1998) when dealing with correlations between group membership including observations of differences between Japanese Americans and Korean Americans in implicit attitudes toward ethnic groups. Greenwald et al. also demonstrated predictive correlations between IAT measures with individual differences within groups. For example, the authors found that ingroup preferences for Japanese and Korean Americans was predicted by measures of their immersion in their respective cultures.

Attitude Studies

The following studies are not related to the measure of anger. However, the following studies are particularly

helpful at illustrating how the IAT has been used to determine association strengths.

Since the development of the IAT, several studies have used this method of measurement to determine association strengths between various attitudes. The following section will provide further details regarding these studies.

In 2000, Greenwald and Farnham conducted an experiment aiming to evaluate implicit and explicit self-esteem. The authors used confirmatory factor analysis to test whether implicit and explicit self-esteem measures converged on a single construct or identified different constructs all together. The results of this experiment demonstrated that the implicit and explicit self-esteem measures had relatively weak correlations with one another. The authors inferred that due to these results the implicit and explicit self-esteem measures were measuring different constructs.

A second experiment by Greenwald and Farnham (2000) attempted to validate a measure of implicit gender self concept. The authors used a known group validation process to accomplish this goal. The assumption was that the IAT would produce similar results to prior research using explicit measures. In other words, Greenwald and Farnham

(2000) conducted a study to compare the ability of the IAT and explicit measures to detect the expected differences shown in previous research regarding men and women in masculinity-femininity of self-concept. The results of this experiment demonstrated that the author's hypothesis were correct. Moreover, the effect sizes found were much larger for the IAT than the explicit measures. This led the authors to state that the IAT is a better method of measuring attitudes.

Taken as a whole, these three experiments confirmed construct validity in three forms: (1) discriminant validity, (2) predictive validity, and (3) known groups' validity.

Dasgupta, McGhee, Greenwald, and Banaji (2000) looked at whether IAT's findings of pro-white attitudes where valid due or were due to alternative interpretations such as greater familiarity with the stimuli. The author's hypothesized that participants would associate positive attributes faster with white than black pictures regardless of their familiarity with name recognition. The results demonstrated that participants responded statistically significantly faster when white pictures were paired with positive attributes and black pictures were paired with

unpleasant attributes than when white pictures were paired with unpleasant attributes and black pictures were paired with pleasant attributes. Therefore, the results confirmed the author's hypothesis.

In 2002, Hummert, Garstka, O'Brien, Greenwald, and Mellott conducted a two part study using the Implicit Association Test to measure age differences in implicit social cognitions. In their initial study on age differences they collected self- report measures and IAT measures on three constructs: (1) age attitude, (2) age identity, and (3) self esteem from young (18-29), young-old (55-74), and old-old (75+) participants. The authors hypothesized that age attitude predicted age differences on explicit but not implicit measures. They also suggested that age identity would differ across the self-report measures and the IAT measures. Finally, the authors stated that self-esteem measures would remain stable across all age groups. The results supported their primary hypothesis that age attitude predicted age differences on explicit but not implicit measures but rejected their hypothesis regarding age similarities and differences in implicit attitudes, identities and self esteem.

Hummert, Garstka, O'Brien, Greenwald, and Mellott (2002) attempted to validate their hypothesis regarding age related slowing on IAT measures and how z-score transformations could control for this phenomenon. The authors conducted an experiment using implicit attitudes towards insects and flowers that had been used in prior research (Greenwald et al., 1998). The authors predicted that all participants, regardless of age differences, would perceive flowers more favorably than insects. However, they also concluded that age related slowing would produce greater response latencies for older than young participants. The authors used z-score transformations instead of the usual log transformations to control for this age related effect. Hummert, Gartska, O'Brien, Greenwald, and Mellot (2002) found that when using the log transformation method found that older adults had a statistically significantly larger IAT effect over younger adults. However when the z-transformation method was applied to the data, there were no differences between older and younger adults on the IAT effect.

Taken together these two studies demonstrated that the IAT is a useful method in measuring age differences but

age-related differences in response latencies must be taken into account when analyzing the data.

Purpose of Study

Anger has been assessed through behavioral observations, clinical interviews, projective techniques, and a number of explicit measures. While these approaches have value, no extant measures assess anger both implicitly and quantitatively. The purpose of the following study is to develop a measure of anger that is capable of measuring anger implicitly and quantitatively. For the purposes of this study, implicit anger will be operationally defined as both a conscious and an unconscious or introspectively unidentifiable thought and feeling towards an object. The Anger Implicit Association Test is purported to measure this construct.

The purpose of this study was to develop and investigate the validity of an implicit association test (IAT) measure of anger. This purpose is important because anger is a psychological construct that has significant implications to nearly every person in everyday life. Increasing our ability to measure anger has the potential to open areas of research that are not presently available. Although many instruments have been developed to measure

anger, there is not a measure of anger currently available that measures anger implicitly. The ability to measure anger implicitly is important because it provides an avenue to the underlying emotions of an individual. Furthermore, by tapping these underlying or unconscious emotions one can measure anger without the possibility of an individual answering in a social desirable manner or "faking good." The following research has put forth such a test.

Research Question

This study attempted to answer the following question. Is the Anger IAT a valid measure of anger? In other words, the study investigated the possibility that angry attitudes can be measured by a person perception task.

This study sought to test the validity of an IAT measure of anger. In order to answer this question the following study applied Hepner, Kivlighan, and Wampold's (1992) method for establishing construct validity. Heppner, Kivlighan, and Wampold stated that construct validity is difficult to determine; however, one way to establish it is by examining the relationships between the scores on an instrument and that of other instruments intended to measure the same construct as well as other instruments intended to measure different constructs.

Furthermore, the authors stated that a pattern should emerge with stronger associations between the instruments that measure related constructs and weaker associations existing between instruments that measure different constructs.

Therefore, it would be expected that the Anger IAT would be correlated with the State-Trait Anger Expression Inventory-2, little or no correlation with the State-Trait Anxiety Inventory, and no correlation with the Rosenberg Self-Esteem Scale. Furthermore, when controlling for social desirability the correlation between the Anger IAT and the State Trait Anger Expression Inventory-2 will increase.

CHAPTER III

METHODS

Participants

The participants are drawn from a population of convenience that is limited to students at a large southwestern university. This is believed to be justifiable because these participants should act no differently than other people on the task. The participants were the first 60 volunteers from Texas A&M University and were treated in accordance with the Institutional Review Board's standards for the protection of human subjects.

The following information was ascertained from the Demographic Data Sheet. The participants ranged in age from 17 to 58. The mean age of respondents was 28.05 (SD = 11.46). Thirty four of the participants were Hispanic. Twenty one of the Hispanics were female and thirteen were male. The mean age of the Hispanic participants was 26.38 (SD = 9.46). There were twenty Caucasian participants. Sixteen of these participants were female and four were male. The mean age of the Caucasian participants was 29.65 (SD = 14.83). Six African Americans participated in this

study. Five were female and one was male. The mean age of the African American participants was 32.17 (SD = 8.56).

Measures

Demographic Data Sheet. The Demographic Data Sheet requested information regarding age, ethnicity, gender, and self reported anger (see Appendix A).

Anger Implicit Association Test (IAT; Cuellar & Conoley, unpublished manuscript). The Anger IAT measures the amount of anger that an individual is currently feeling. This is measured through reaction times to word associations that tap unconscious angry attitudes. The Anger IAT consisted of 40 stimulus words: 10 angry words (e.g., murder, kill, torture, stab, bloody, bomb, destroy, shoot, strangulate, terror), and 10 peaceful words (e.g., help, smile, wave, kiss, hug, high five, visit, fond, love, greet, laugh,). The peaceful and angry words employed were developed by Conoley (personal communication, January 2002).

The Anger IAT was developed by Cuellar and Conoley (2005). The words used to demonstrate an association between self and angry or peaceful words was employed by a study conducted by Conoley (personal communication 2001).

These words were then incorporated into the Implicit Association Test developed by Greenwald et al. (1998).

The Anger IAT was presented to subjects using a computer so that the reaction times can be accurately measured. The directions and practice experiences are presented on the computer and integrated into the assessment procedure. The process of the Anger IAT administration can be conceptualized as having five steps.

Step 1. The first step taught the subjects how to respond to the tasks using two keys. Subjects distinguished between the target concepts of “self” and “other” by pressing the right key for “self” and the left key for “other.” Figure 1 and Figure 2 display the information that the subjects observed on the computer screen.

The tasks that you will be doing in this experiment involve CATEGORY JUDGMENT. On each trial, a stimulus will be displayed, and you must assign it to one of two categories. You should respond as rapidly as possible in categorizing each stimulus, but don't respond so fast that you make many errors (occasional errors are okay).

The two categories that you are to distinguish are

"other" vs. "self" words

Press the 'a' key if the stimulus is an OTHER word

But press the '5' key if the stimulus is a SELF word

Figure 1. Instructions for the target concept discrimination task("other" vs. "self").

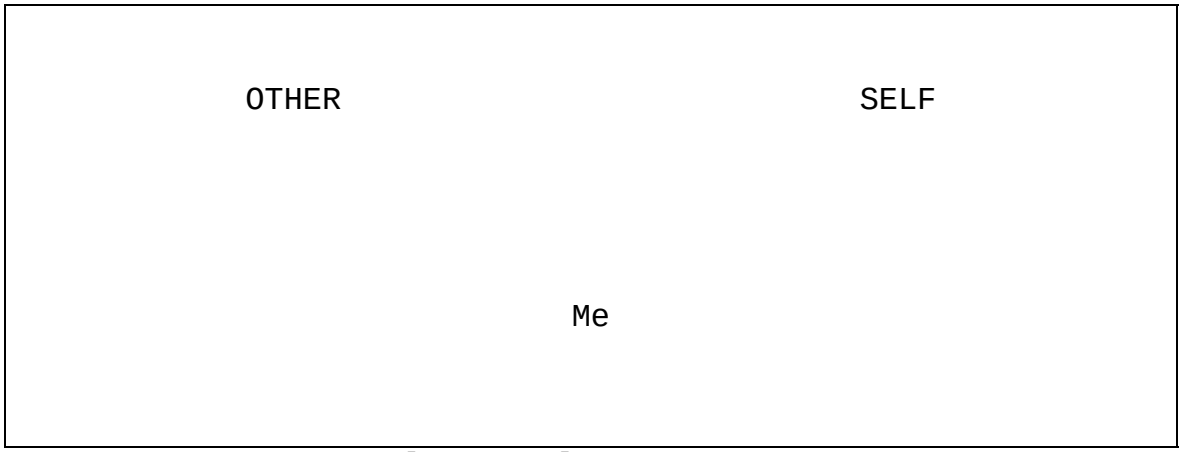

Figure 2. Sample stimuli for the target concept discrimination step ("other" vs. "self").

Step 2. The second step introduced the subjects to the second dimension, the attribute part of the IATA task. Subjects were asked to differentiate among the stimuli representing the attribute dimension of angry vs. peaceful. They were asked to press the right key for angry words and the left key for peaceful words. Figure 3 and Figure 4 display the info that the subjects observed on the computer screen.

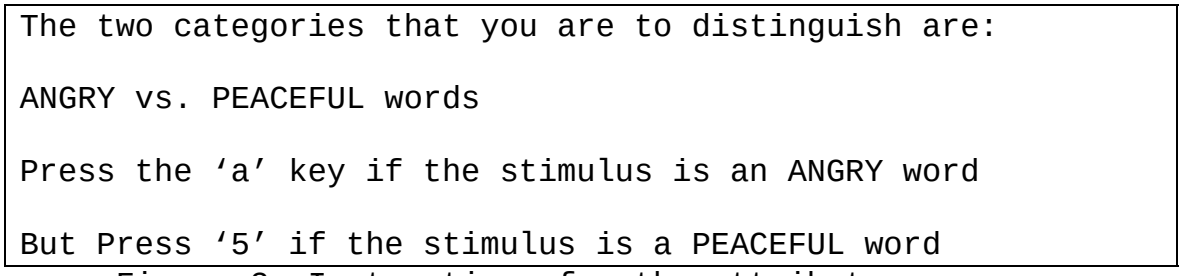

Figure 3. Instructions for the attribute discrimination task (ANGRY words vs. PEACEFUL words).

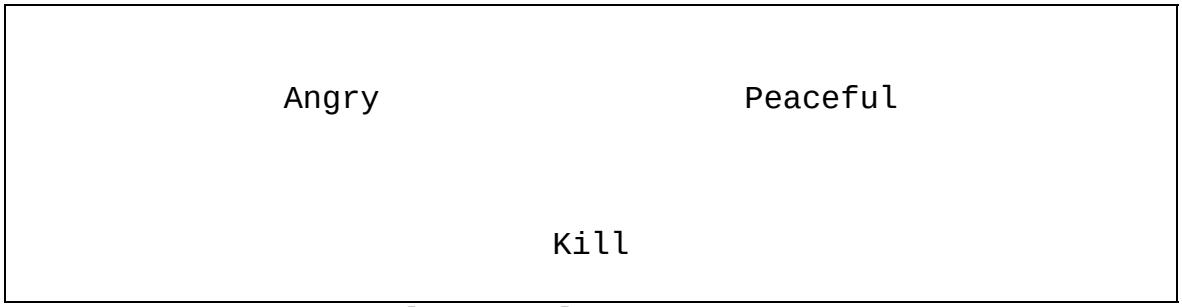

Figure 4. Sample stimuli for the attribute discrimination task (ANGRY words vs. PEACEFUL words).

Step 3. The third step introduced the subjects to the combined categorization of the two previous dimensions. The subjects were asked to categorize items into two combined categories including the target and attribute concepts that were previously assigned to the same key in steps 1 and 2. More specifically, the subjects responded to the “self” and the peaceful words with the left key and the “other” and angry words with the right key. Figure 5 and Figure 6 display the information that the subjects observed on the screen. If a person felt angry this combination of self with peaceful words would have a relatively slower reaction time than pairing angry words with self.

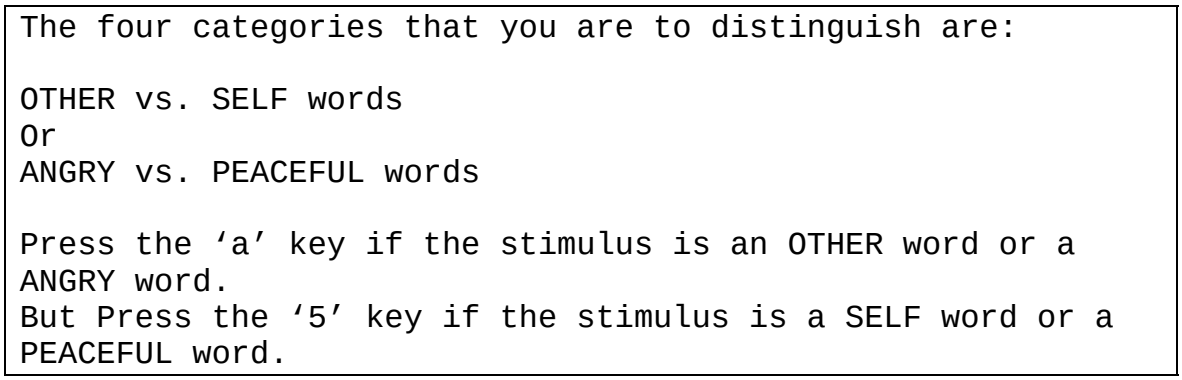

Figure 5. Instructions for the target + attribute combined task (“other” + ANGRY vs. “self” + PEACEFUL).

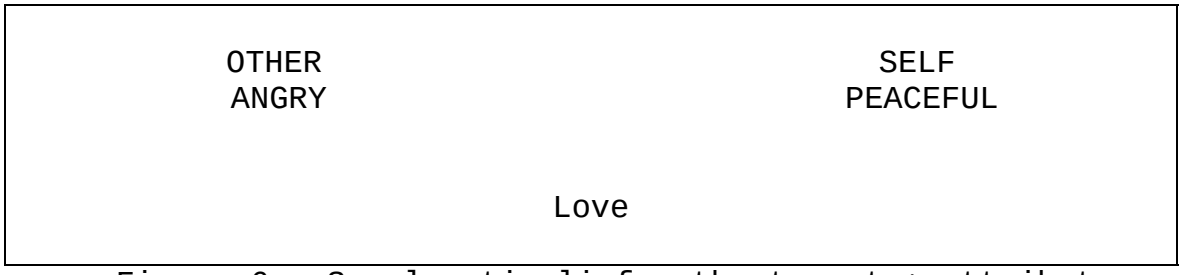

Figure 6. Sample stimuli for the target + attribute combined task (“other” + Angry vs. “self” + PEACEFUL).

Step 4. The subjects repeated step 1 but with the responses reversed. This step was done to counter any effects that may occur due to a subject responding faster with one finger over the other. Figure 7 and Figure 8 display what the subjects observed on the screen.

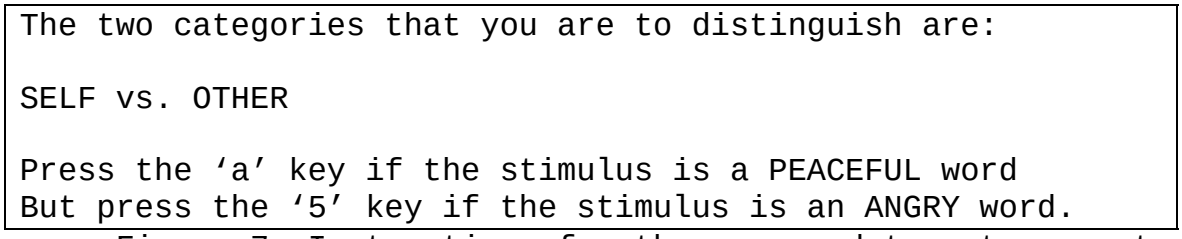

Figure 7. Instructions for the reversed target concept discrimination task (SELF vs. OTHER).

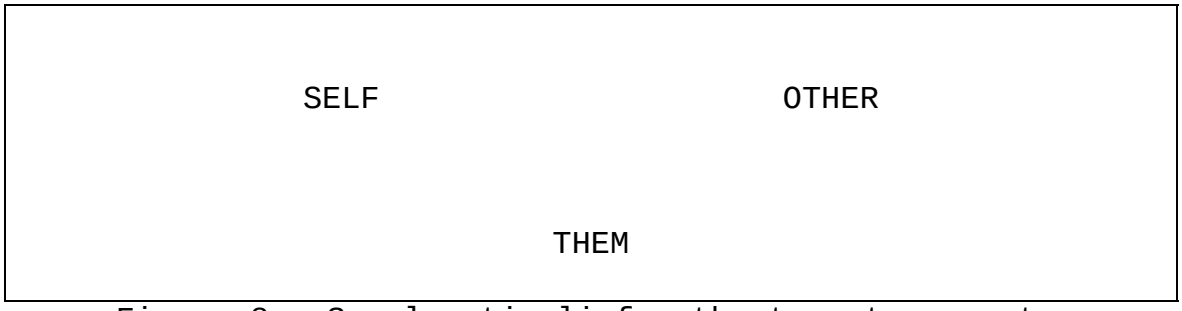

Figure 8. Sample stimuli for the target concept discrimination step (“self” vs. “other”).

Step 5. The subjects were asked to categorize items into two combined dimensions that included the target and attribute concepts that were previously assigned to the same key. More specifically, the subject responded to the “self” and Angry words with the left key and the “other” and the peaceful words with the right key. This step is similar to step 3 but uses the switched key assignments used in step 4. Figure 9 and Figure 10 display the information that the subjects observed on the screen.

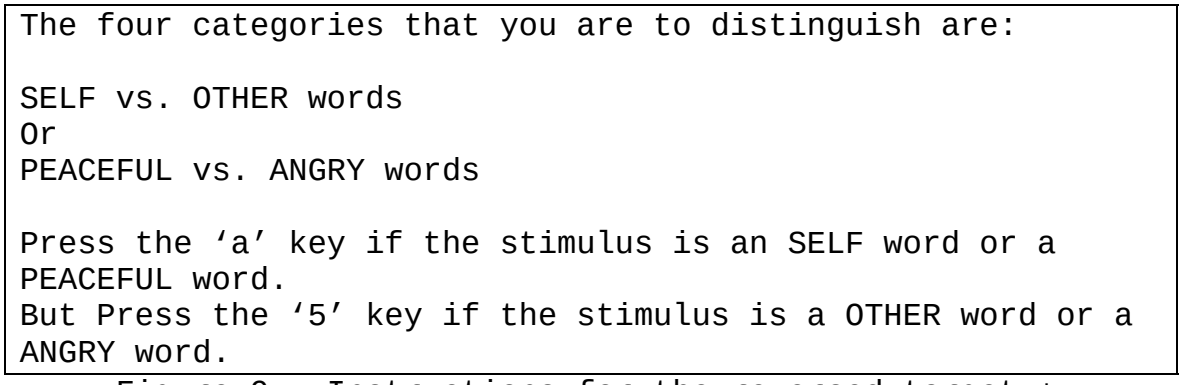

Figure 9. Instructions for the reversed target + attribute combined task (“self” + PEACEFUL vs. “other” + ANGRY).

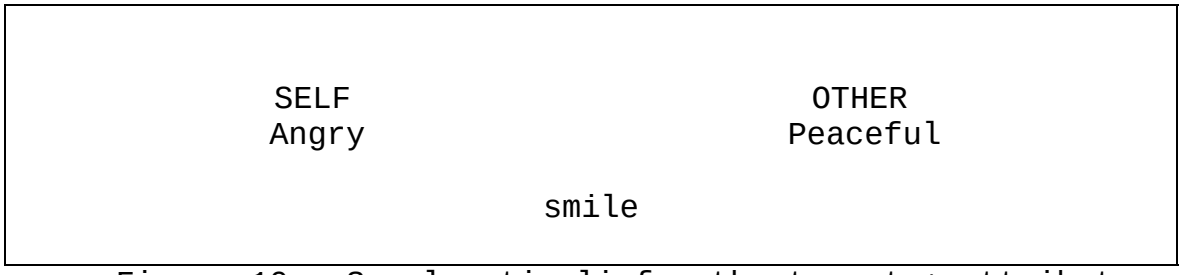

Figure 10. Sample stimuli for the target + attribute combined task (“self” + PEACEFUL vs. “other” + ANGRY).

The order described above was given to half of the subjects. However, step 2 and step 3 were given after step 4 and step 5 for the other half of the subjects. Switching

the order of presentation was performed to counterbalance possible task order effects.

The IAT effect is measured by examining the differential reaction time between the pairs of words that fit the subject's feeling state and the pairs of words that do not fit the subject's feeling state. The reaction time for the pair of words that fit the subject's state should be faster. The test blocks used to determine the IAT effect were blocks 3 and 5. The IAT effect was calculated by subtracting the mean response latency for performing the ("OTHER" + PEACEFUL words and "SELF" + ANGRY words) from "OTHER" + ANGRY words and "SELF" + PEACEFUL words). Positive scores demonstrate an association between self and angry words whereas a negative score demonstrates an association between self and peaceful words.

State-Trait Anger Expression Inventory-2 (STAXI-2; Spielberger, 1996). The State-Trait Anger Expression Inventory-2 is a self-report measure which was used to assess each participant's state anger and trait anger (see Appendix B). The state anger scale had three subscales which measured the intensity of angry feelings a participant was currently experiencing, the intensity of current feelings related to the verbal expression of anger,

and the intensity of current feelings related to the physical expression of anger. The trait anger scale had two subscales that measured the participant's disposition to experience anger without specific provocation and the frequency that angry feelings were experienced in situations that involved frustration and/or negative evaluations.

The STAXI-2 may be administered to individuals who are older than 13. Although there is not a time limit for this test most subjects usually complete the inventory within 15 minutes (Spielberger, 1988). The STAXI-2 is composed of 57 items which were administered in three parts: (a) state anger, (b) trait anger and (c) anger expression. State anger is composed of three subscales totaling 15 items: Feeling angry, Feel like expressing anger verbally, and Feel like expressing anger physically. Trait anger is composed of two subscales, totaling ten items: Angry temperament and Angry reaction. The anger expression is composed of two expression constructs. The anger-in construct related to anger expressed inward toward self and how often this is experienced. The anger-in construct consists of eight items. The anger-out construct relates to anger expressed outwardly towards people and objects in

a verbal or physical manner. The anger-out construct consists of eight items. Anger control relates to two control constructs. The anger control-out construct identifies how often a person controls the outward expression of their angry feelings. The control-out construct consists of eight items. The anger control-in construct identifies how often a person controls their angry feelings by calming down or cooling off. The control-in construct consists of eight items. Finally, there is an anger expression index which provides a general index of anger. The inventory consists of three parts. The first two parts are composed of 25 items each and provide scores for the state and trait portions of the inventory. The last section is composed of 32 items and provides scores for the expression, control, and index portions of the inventory.

State anger reliability from the standardization studies ranged from .87 to .93 and trait anger reliability ranged from .82 to .84. The reliability ranged for anger expression-in, anger expression-out, and anger expression-control from .73 to .86, .73 to .78, and .81 to .85, respectively (Spielberger, 1988). These ranges of reliability are considered strong.

Validity for the STAXI-2 has been established through concurrent validity and factor analysis. Trait anger correlates highly with the Buss-Durkee Hostility Inventory, .69. Spilberger (1996) conducted a factor analysis on the STAXI-2. He identified two factors for both male and females on the state-anger items. The factor loadings ranged from .34 to .97. The trait-anger items also loaded on two factors for both male and females. The factor loadings for trait anger items ranged from .45 to .88 on factor 1 and from .37 to .88 on factor 2. Next, Spielberger (1996) identified four factors for the anger expression and anger control items. The factor loadings for the anger control-in items ranged from .51 to .92. The factor loadings for the anger control-out items ranged from -.23 to .92. The factor loadings for the anger expression-in items ranged from .37 to .67. Finally, the factor loadings for the anger expression-out ranged from .18 to .70.

State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg,& Jacobs, 1970). The State-Trait Anxiety Inventory assessed the participant’s state anxiety and trait anxiety (see Appendix C). This inventory is a self-report measure that usually takes between 10 to 20

minutes to administer. It can be administered to people over grade level 9. The inventory includes separate measures of state and trait anxiety. State anxiety reflects a subjective state which may fluctuate over time and can vary in intensity. In contrast, trait anxiety is a stable trait and refers to a general tendency to respond in an anxious manner when a perceived threat is recognized by an individual.

In the initial standardization studies (Spielberer, Vagg, Barker, Donham, & Westberry, 1980) reliability of the inventory was assessed through test-retest intervals ranging from one hour to 104 days. Trait anxiety scale coefficients ranged from .65 to .86, whereas the range for the State anxiety scale was .16 to .62. According to the author this low level of stability was expected for the State anxiety scale because it reflects a subjective state that changes over time and is influenced by situational factors.

Validity was established through concurrent validity and factor analysis. In 1970, Spielberger, Gorusch, Lushene, Vagg and Jacobs reported the following correlations between the STAI and the Taylor Manifest Anxiety Scale, the IPAT Anxiety Scale, and the Multiple

Affect Adjective Check List respectively as .80, .75, and .52. In 1980, Spielberer, Vagg, Barker, Donham, & Westberry, 1980 conducted a factor analysis on the STAI. After testing 424 tenth grade students, the authors identified four factors for both females and males. The factor loadings ranged from .40 to .71.

Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The Rosenberg Self-Esteem Scale was used to assess the participant's self-esteem (see Appendix D). The Rosenberg Self-Esteem Scale is scored as a Likert scale. The 10 items that comprised the form were answered on a four point scale that ranged from strongly agree to strongly disagree. The scores ranged from 0-30, with 0 indicating the lowest score possible and 30 indicating the highest score possible. The larger number indicates lower self-esteem of the subject. Items 3, 5, 8, 9, and 10 were reverse scored. The original sample was composed of 5,024 high school juniors and seniors from 10 randomly selected schools in New York State (Rosenberg, 1965).

According to Blascovich and Tomaka, (1993) test-retest correlations are typically in the range of .82 to .88. Furthermore, in 1987 Rosenberg found that the Cronbach's alpha for various samples were in the range of .77 to .88.

In 1965, Rosenberg stated that although the self-esteem scale that he created had face validity that was not enough to establish the adequacy of the scale. However, he explained that there were no known groups or criterion groups to validate the scale. Therefore, he defended the scale on the assumption that that if the scale actually measures self-esteem then one would expect the scale to be associated with some other data in a meaningful manner. He hypothesized that depression accompanies low self-esteem; therefore, people with low self-esteem should appear more depressed. He conducted an experiment and found his hypothesis to be substantiated thereby validating his scale.

Marlowe-Crowne 2(10) Social Desirability Scale (MC2(10); Strahan & Gerbasi, 1972). The Marlowe-Crowne 2(10) Social Desirability Scale (1972) assessed the participant’s tendency to answer in a socially desirable manner or tendency to present oneself in a good light (see Appendix E). This scale is composed of 10 items which respondents answered true or false to behaviors that were either desirable but uncommon or undesirable but common. The scores ranged from 0-10 with higher scores representing a higher need for approval. Alpha coefficients for the MC

2(10) for university males, university females, college females, and British males were .62, .75, .49, and .62, respectively.

Validity of the scale was determined through cross validation from the larger version and two shorter versions, Marlowe-Crown Social Desirability Scale (Crown & Marlowe, 1960). The cross-validation results obtained ranges from .80 to .90.

Participants were recruited through educational-psychology classes and a written flyer requesting participants for a study regarding word meaning as an automatic skill (see Appendix F). On arrival, the participants were told that the experiment involved a number of tasks that dealt with word meaning as an automatic skill. They were told that they would be asked to fill out questionnaires asking about their feelings and perform a reaction test. When the subjects completed the informed consent (see Appendix G) they received computerized instructions that explained the Anger IAT. The Anger IAT was administered on a Hewlitt-Packard Pavillion ze4500 desktop. The Anger IAT used the standard procedure for the Anger IAT. Responses were assigned to

the left and right forefinger. The IAT stimuli appeared vertically and horizontally centered on the screen.

There were a total of five trail blocks employed in the current study. Each trial block began with instructions describing the category discriminations and the assignment of response keys. On each trial the stimulus item remained on the screen until the subject responded. After the subject responded the screen would be blank if the response was correct or the screen would contain the word “error” if the response was incorrect. Trials were conducted with a 250 ms interval between responses to one stimulus and presentation of another. After the Anger IAT was completed the participants were administered the explicit measures: Demographic Data Sheet, STAXI-2, STAI, RSES, and MCSDS. After the materials were completed the participants had an opportunity to ask questions or provide remarks regarding the nature of the test to the experimenter.

Areas of Concern

The majority of the participants when speaking with the experimenter stated that the Anger IAT was confusing at first but were able to overcome the initial confusion by the end of the second trial. More importantly during these

feedback sessions, six individuals told the experimenter that they had an extremely difficult time combining the “self” and Angry word combinations. However, for the most part the participants responded quite favorably to the Anger IAT.

CHAPTER IV

RESULTS

Descriptive Statistics

Means and standard deviations were computed for all variables concerned. Theses are located in Appendix H, Appendix I, and Appendix J.

Reliability Analysis

Reliability coefficients were calculated for the measures. Cronbach Alphas for the State-Trait Anxiety Inventory (Spielberger, 1996) were assessed through inter-item reliability. The reliability for the following scales were: 1) state anger, r = .94, 2) state anger-feelings, r = .92, 3) state anger-verbal, r = .90, 4) state anger-physical, r = .74, 5) trait anger, r = .85, 6) angry temperament, r = .90, 7) angry reaction, .71 8) angry expression-out, r = .76, 9) angry expression-in, .74, 10) anger control-out, .88, 11) anger control-in, .88, and 12) anger expression index, r = .75. These are all considered strong associations. Cronbach alphas were also used to assess the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, and Jacobs 1970). The reliabilities for the state and trait scales were .91 and .90, respectively. These results are also considered

strong inter-item associations. A reliability coefficient was also used to assess reliability for the Rosenberg Self-Esteem Scale (Rosenberg, 1965). The Cronbach Alpha for this scale was .83 which is considered a strong inter-item correlation. Finally, the Cronbach alpha for the Marlowe-Crown 2(10) Social desirability scale was .48 which is low yet consistent with short form of the original Marlow Crown Social Desirability Scale.

IAT Data Analysis

The data preparation and data analysis followed the procedure used by Greenwald and Banaji (1995). This was followed because Greenwald is the leading researcher in the IAT literature. The first trial of each experimental task was excluded from analysis because these responses were typically longer than subsequent trials due to the participant's inexperience with the test. Latencies were then log transformed to reduce the skew. The means were calculated from the log transformed scores. Finally, 9 subjects were excluded from analysis because of an error rate higher than 20 percent which is the recommended cut-off for error rate outlier data (Greenwald & Banaji, 1995).

Anger IAT score for each subject was computed by subtracting the mean response latency for “other” paired with peaceful words and “self” paired with Angry words (i.e., the I feel angry stimulus combination) from the mean response latency for “other” paired with Angry words and “self” paired with peaceful words (i.e., the I feel peaceful stimulus combination). Therefore, positive differences demonstrated stronger associations with anger whereas negative differences indicated a stronger association with peace.

This experiment investigated the validity of an IAT measure of anger. It was assumed that persons with angry feelings responded faster to pairings of “me” and angry words than “me” and peaceful words. The mean response latency for the Anger IAT effect was 427ms (SD = 112).

Hypothesized Relationships

The relationship between Anger IAT, self-report measure of anger, anxiety, and self-esteem were examined. It was hypothesized that the Anger IAT would be moderately to highly correlated with a paper and pencil test of anger, correlated less with an anxiety measure, and correlated least with a self-esteem measure.

Table 1 depicts the hypothesized relationships among the Anger IAT, State-Trait Anger Expression Inventory-2, State-Trait Anxiety Inventory, and the Rosenberg Self Esteem Scale.

Table 1. Expected Correlations between the Anger IAT, State-Trait Anger Expression Inventory-2, State-Trait Anxiety Inventory, and the Rosenberg Self Esteem Scale.

	1	2	3	4
1. IAT	--	high	low	little
2. STAXI-2		--	high	moderate
3. STAI			--	moderate
4. RSES				--

Note. N = 51. IAT = Anger Implicit Association Test: STAXI-2 = State-Trait Anger Expression Inventory-2: RSES = Rosenberg Self Esteem Scale: STAI = State-Trait Anxiety Inventory.

Pearson r Correlations

The relationship between Anger IAT and measures of anger, anxiety, and self-esteem were calculated using Pearson r correlations. Table 2 presents the correlations among the Anger IAT, self-reported measure of anger gathered from the Demographic Data Sheet, Rosenberg Self Esteem Scale, State Anxiety Scale, and Trait Anxiety Scale. The results did not demonstrate any statistically significant correlations between the Anger IAT and the aforementioned variables. However, there was a positive correlation between the Rosenberg Self-Esteem Scale (RSES) and state anxiety scale, $r = .42$, and the Rosenberg Self-Esteem Scale (RSES) and trait anxiety, $r = .51$. Furthermore, there was a statistically significant correlation between state and trait anxiety, $r = .50$.

Table 2. Pearson r Correlations between the Anger IAT, Anger Problem, Rosenberg Self Esteem Scale, State Anxiety Scale, and the Trait Anxiety Scale.

	1	2	3	4	5
1. IAT	--	-.21	-.11	.11	-.20
2. ANGP		--	-.17	-.18	-.09
3. RSES			--	*.42	*.51
4. SANX				--	*.50
5. TANX					--

Note. N = 51. IAT = Anger Implicit Association Test: ANGP = Anger Problems: RSES = Rosenberg Self Esteem Scale: SANX = State Anxiety Scale: TANX = Trait Anxiety Scale. * p < .05.

Table 3 provides the Pearson r correlations among the Anger IAT, and the state anger subscales of the State-Trait Anger Expression Inventory-2. The results did not demonstrate any statistically significant correlations between the Anger IAT and state anger subscales of the State-Trait Anger Expression Inventory-2 (STAXI-2). The results did demonstrate statistically significant

correlations between the state anger subscales which are to be expected because they are measuring similar constructs.

Table 3. Pearson r Correlations between the Anger IAT and the State Anger Subscales of the State-Trait Anger Expression Inventory-2.

	1	2	3	4	5
1. IAT	--	.15	.26	.12	-.06
2. SANG		--	*.89	*.97	*.84
3. SANGF			--	*.78	*.53
4. SANGV				--	*.85
5. SANGP					--

Note. N = 51. IAT = Anger Implicit Association Test: SANG = State Anger: SANGF = State Anger-Feelings: SANGV = State Anger-Verbal: SANGP = State Anger-Physical. * p < .05.

Table 4 presents the Pearson r correlations among the Anger IAT, and the trait anger subscales of the State-Trait Anger Expression Inventory-2. The results demonstrated

that the correlations between the Anger IAT and the trait anger subscales of the STAXI-2 were not statistically significant. However, the high correlations between the trait anger subscales were statistically significant. The correlations between the subscales were expected because they were measuring similar constructs.

Table 4. Pearson r Correlations between the Anger IAT and the Trait Subscales of the State-Trait Anger Expression Inventory-2.

	1	2	3	4
1. IAT	--	-.03	.01	-.05
2. TANG		--	*.90	*.81
3. TANGT			--	*.58
4. TANGR				--

Note. N = 51. IAT = Anger Implicit Association Test: TANG = Trait Anger: TANGT = Trait Anger-Temperament: TANGR = Trait Anger- Angry Reaction. * $p < .05$.

Table 5 provides the Pearson r correlations among the Anger IAT, anger expression, anger control, and anger index subscales of the State-Trait Anger Expression Inventory-2. The correlations between the Anger IAT and the aforementioned variables were not found to be statistically significant. However, the correlations between the Anger Expression-Out (AXO), Anger Expression-In (AXI), and Anger Expression Index (AXINDEX) were statistically significant with one another but not with the Anger IAT.

Controlling Social Desirability

The literature suggests that people are often unwilling to self-report feelings of anger. Therefore, the

Table 5. Person r Correlations among the Anger IAT Measure and the Anger Expression, Anger Control, and Anger Index Subscales of the State-Trait Anger Expression Inventory-2.

	1	2	3	4	5	6
1. IAT	--	.13	.16	.09	.13	.02
2. AXO		--	*.62	*-.47	*-.35	*.70
3. AXI			--	*-.38	*-.37	*.73
4. ACO				--	*.79	*-.86
5. ACI					--	*-.82
6. AXINDEX						--

Note. N = 51. IAT = Anger Implicit Association Test: AXO = Anger Expression-Out: AXI = Anger Expression-In: ACO = Anger Control-Out: ACI = Anger Control-In: AXINDEX = Anger Expression Index. * p < .05.

analysis was conducted controlling for social desirability issues. Specifically, the relationship between the Anger IAT and measures of anger, anxiety, and self-esteem were examined using partial correlations. The influence of the Marlowe-Crowne Social Desirability Scale was partialled out of the relationship between the Anger IAT measure of anger and the other measures. Table 6 presents the partial correlations among the Anger IAT, the self-reported measure of anger gathered from the Demographic Data Sheet, the

Rosenberg Self Esteem Scale, the State Anxiety Scale, and the Trait Anxiety Scale. The correlation between the Anger IAT and anger problem was statistically significant (r = -.27) at the .05 level of probability.

Table 6. Correlations between the Anger IAT, Anger Problem, Rosenberg Self Esteem Scale, State Anxiety, and Trait Anxiety when Partialling out Marlowe-Crowne Social Desirability Scale.

	1	2	3	4	5
1. IAT	--	*-.27	-.04	.19	-.14
2. ANGP		--	-.12	-.12	-.02
3. RSES			--	*.36	*.46
4. SANX				--	*.45
5. TANX					--

Note. N = 51. IAT = Anger Implicit Association Test: ANGP = Anger Problems: RSES = Rosenberg Self Esteem Scale: SANX = State Anxiety Scale: TANX = Trait Anxiety Scale. * p < .05.

Table 7 provides the partial correlations among the Anger IAT, and the state anger subscales of the State-Trait Anger Expression Inventory-2. The correlations between the

Anger IAT and state anger (SANG) (r = .30) and the Anger IAT and state anger-feeling (SANGF) (r = .41) were statistically significant at the .05 level of probability.

Table 7. Correlations between the Anger IAT, State Anger, State Anger-Feelings, State Anger-Verbal, and State Anger-Physical when Partialling out Marlowe-Crowne Social Desirability Scale.

	1	2	3	4	5
1. IAT	--	*.30	*.41	.25	.04
2. SANG		--	*.86	*.96	*.80
3. SANGF			--	*.72	*.42
4. SANGV				--	*.82
5. SANGP					--

Note. N = 51. IAT = Anger Implicit Association Test: SANG = State Anger: SANGF = State Anger-Feelings: SANGV = State Anger-Verbal: SANGP = State Anger-Physical. * p < .05.

Table 8 provides the partial correlations among the Anger IAT, and the trait anger subscales of the State-Trait Anger Expression Inventory-2. There were no statistically

significant correlations between the Anger IAT and the trait anger subscales of the STAXI-2.

Table 8. Correlations between the Anger IAT, Trait Anger, Trait Anger-Temperament, and Trait Anger-Angry Reaction when Partialling out the Marlowe-Crowne Social Desirability Scale.

	1	2	3	4
1. IAT	--	.13	.16	.08
2. TANG		--	*.85	*.73
3. TANGT			--	*.41
4. TANGR				--

Note. N = 51. IAT = Anger Implicit Association Test: TANG = Trait Anger: TANGT = Trait Anger-Temperament: TANGR = Trait Anger- Angry Reaction. * p < .05.

Table 9 provides the partial correlations among the Anger IAT, anger expression, anger control, and anger index subscales of the State-Trait Anger Expression Inventory-2.

There was a statistically significant correlation between the Anger IAT and the anger expression-out (AXO) (r = .28).

Table 9. Correlations between the Anger IAT, Anger Expression, Anger Control, and Anger Index Subscales of the State-Trait Anger Expression Inventory-2 when Partialling out the Marlowe-Crowne Social Desirability Scale

	1	2	3	4	5	6
1. IAT	--	*.28	.26	-.04	.03	.19
2. AXO		--	*.54	-.26	-.15	*.58
3. AXI			--	-.22	-.22	*.68
4. ACO				--	*.72	*-.78
5. ACI					--	*-.75
6. AXINDEX						--

Note. N = 51. IAT = Anger Implicit Association Test: AXO = Anger Expression-Out: AXI = Anger Expression-In: ACO = Anger Control-Out: ACI = Anger Control-In: AXINDEX = Anger Expression Index. * p < .05.

In conclusion, the associated strengths (with effect size in parenthesis) found between the Anger IAT Effect and

the subsequent variables are as follows: 1) anger problem -.27 (.07), 2) state anger .30 (.09), 3) state anger-feelings .41 (.17), 4) state anger-verbal .25 (.06), 5) state anger-physical .04 (.0002), 6) trait anger .13 (.02), 7) trait anger-temperament .16 (.03), 8) trait anger-angry reaction .08 (.006), 9) anger expression-out .28 (.08), 10) anger expression-in .26 (.07), 11) anger control out -.04 (.002), 12) and anger control-in .03 (.001), and the 13) anger expression index .19 (.04).

Post-Hoc Test

Although the following was not part of the original question, Post-hoc t-tests were applied to all the quasi-independent variables and a statistically significant difference was found between response latency and race of participant. A Post-Hoc T-Test was performed to explore differences between the Hispanic and Caucasian samples. There was a statistically significant difference between Hispanic response latency ($M = 213.11$, $SD = 407.10$) and Caucasian response latency ($M = -77.10$, $SD = 373.35$), $t(52) = 2.607$, $p = .012$ (two-tailed) on the Anger IAT. The Hispanic participants answered faster to associations (pairings) of “self” and “angry” words than the Caucasian participants.

CHAPTER V

DISCUSSION AND CONCLUSION

The following chapter is organized in four sections. First, the purpose of the study is summarized. Second, the results from the study are described and interpreted. Third, limitations of the study are described. Fourth, recommendations and implications are presented.

Purpose of Study

The purpose of this study was to develop and investigate the validity of an implicit association test (IAT) measure of anger. This purpose is important because anger is a psychological construct that has significant implications to nearly every person in everyday life. Increasing our ability to measure anger has the potential to open areas of research that are not presently available. Although many instruments have been developed to measure anger, there is not a measure of anger currently available that measures anger implicitly. The ability to measure anger implicitly is important because it provides an avenue to the underlying emotions of an individual. Furthermore, by tapping these emotions one can measure anger without the possibility of an individual answering in a socially

desirable manner or “faking good.” This research has put forth such a test.

This study sought to test the validity of an IAT measure of anger. In order to answer this question the following study applied Hepner, Kivlighan, and Wampold’s (1992) method for establishing construct validity. Hepner, Kivlighan, and Wampold stated that construct validity is difficult to determine; however, one way to establish it is by examining the relationships between the scores on an instrument and that of another instrument intended to measure the same construct as well as other instruments intended to measure different constructs. By using a variety of measures a pattern should emerge with a stronger association between the instruments that measure related constructs and weaker associations existing between instruments that measure different constructs.

Therefore, it would be expected that the Anger IAT would be correlated with the State-Trait Anger Expression Inventory-2, little or no correlation with the State-Trait Anxiety Inventory, and no correlation with the Rosenberg Self-Esteem Scale. Furthermore, when controlling for social desirability the correlation between the Anger IAT and the State Trait Anger Expression Inventory-2 will increase.

Summary of Results

The Anger IAT was expected to converge with the State-Trait Anger Expression Inventory-2 (STAXI-2) because both purport to measure the same construct, anger. Although the associations between the Anger IAT and the State-Trait Anger Expression Inventory-2 were not statistically significant, they were consistent with findings of other IAT and self-report measures (Greenwald & Farnham, 2000). In the study by Greenwald and Farnham a correlation of .17 was found between IAT self-esteem measures and an explicit measure of self-esteem. According to these authors, this could mean that the two tests are measuring similar but yet distinct constructs. Furthermore, the average correlation between IAT and self report measures for 16 items was r = .25 (Greenwald & Nosek, 2001). Greenwald and Nosek (2001) concluded that since IAT attitude measures have correlated weakly with self-report measures then the IAT may assess constructs that are different from the constructs measured by the self-report instruments.

The results are consistent with Hepner, Kivlighan, and Wampold's (1992) assumptions for construct validity. The pattern converges with similar constructs (higher

correlations) and diverges with differing constructs (lower correlations).

The Anger IAT was expected to have a low correlation or no correlation with the State-Trait Anxiety Inventory. This is important because it helps to demonstrate construct validity. The assumption is that a low or no correlation between the Anger IAT and State-Trait Anxiety Inventory indicates that the Anger IAT is not measuring the same construct as the State-Trait Anxiety Inventory. The results of the study demonstrated this assumption and therefore provide further support of construct validity for the Anger IAT. The association strengths between the Anger IAT and state anxiety and trait anxiety were .11 and -.20, respectively. These results were expected because the Anger IAT and the State-Trait Anxiety Inventory are measuring two separate and distinct constructs. Moreover, it was expected that the Anger IAT and State-Trait Anxiety Inventory would have a little to no correlation. Past experiments have demonstrated a low correlation between anger and anxiety (Jackson, 1967; Zuckerman & Lubin, 1965).

The Anger IAT was expected to have no correlation with a measure of the Rosenberg Self-Esteem Scale. The results supported the aforementioned assumption. The association

between the Anger IAT and the Rosenberg Self-Esteem Scale were -.04. The result was expected because the Anger IAT and the Rosenberg Self-Esteem Scale are measuring different constructs.

Finally, the correlation between the Anger IAT and the State-Trait Anger Expression Inventory-2, when controlling for social desirability, was expected to be larger than when not controlling for social desirability. The size of association between the Anger IAT and the State-Trait Anger Expression Inventory were greater when the Marlowe-Crowne Social desirability Scale was used as a moderating variable between the self-report of anger (STAXI-2) and the Anger IAT. Moreover, the association strengths between the Anger IAT and the State-Trait Anger Expression Inventory-2 were statistically significant for three subscales of the State-Trait Anger Expression Inventory-2. The association strengths between the Anger IAT and these three variables; anger expression-out (AXO), state anger (SANG), and state anger-feelings (SANGF) were .28, .30, and .41, respectively. The association strengths between the Anger IAT and the anger expression-out (AXO), state anger (SANG), and state anger-feelings (SANGF) prior to using the Marlowe-Crowne Social Desirability scale as a moderating

variable were .13, .15, and .26, respectively. Therefore, the hypothesis that controlling for social desirability would increase the correlation between the Anger IAT and the State-Trait Anger Expression Inventory-2 was supported by the results. The subscales will be discussed in detail to better identify the nature of the correlations and what the Anger IAT is measuring.

According to Spielberger (1999) the state anger scale measures the intensity of angry feelings and how often a person feels like expressing their anger at a specific time. The association between the Anger IAT and state anger subscale demonstrated a low positive relationship. This finding helps support the hypothesis for convergent validity but the correlation was lower than expected.

The state anger-feelings scale measures the intensity of angry feelings that a person is currently experiencing (Spielberger, 1999). This scale is relatively transient in nature and ranges from mildly annoyed to furious. The association between the Anger IAT and state anger-feelings subscale demonstrated a low positive relationship. Once again, this result supports the hypothesis for convergent validity but the correlation was lower than expected.

The anger expression-outward scale (AXO) measures how often angry feelings are expressed either verbally or physically (Spielberger, 1999). Furthermore, individuals with high scores on this scale may express their anger by slamming doors or physically assaulting someone. Verbally, they may express their anger through insults, criticisms, profanity and sarcasm. The association between the Anger IAT and anger expression-out subscale demonstrated a low positive relationship. This was also lower than expected.

To reiterate: Is the Anger IAT a valid measure of anger? The results demonstrated that the Anger IAT has a stronger association with the State-Trait Anger Expression Inventory-2, less with the State-Trait Anxiety Inventory, and least with the Rosenberg Self Esteem Scale. Therefore, the results fit the assumptions set forth for construct validity by Hepner, Kivlighan, and Wampold (1992). Furthermore, the results demonstrated that the Anger IAT may be measuring current or state anger feelings that a person is experiencing and wants to express verbally or physically.

Post-Hoc Analysis

Although the following was not part of the original question, Post-hoc t-tests were applied to all the quasi-

independent variables and a statistically significant difference was found between response latency and race of participant. Due to the aforementioned results, it appears that Hispanics reported more intensity of angry feelings that they were experiencing. Future research may which to investigate this phenomenon.

Limitations

Ideally, the best method to establish construct validity is through a multitrait-multimethod matrix design. This author used a multitrait design to establish construct validity of the Anger IAT. Given unlimited resources and time the author would have conducted a multitrait-multimethod design. However, other studies have used the multitrait design and the results were valid so this author felt confident with the multitrait design to establish construct validity. A further limitation was sample size. A larger sample size would have allowed for the examination of anger validity for different ethnic groups, age differences, and gender differences.

Future Recommendations

Past research on anger has largely depended on self-report measures (explicit tests). Future research using

the Anger Implicit Association Test may provide new information about anger. The ability to measure anger without depending on the participant's willingness to be open and honest about reporting their attitudes and feelings could open new understanding to further our treatment and prevention of anger and aggressive problems. Further research on the Anger IAT may focus on studies between known groups of angry individual, such as individuals who have committed violent crime as compared with a nonviolent group. This could help demonstrate the sensitivity of the Anger IAT as a measure that can discern the differences between various groups and eventually provide baselines or norms for the different groups. Future research could also lead to a better understanding of limits of the Anger IAT measure. It would be significant to find that the Anger IAT predicted aggressive acts so that prevention could be focused. Knowing a person needs help containing heightened amounts of anger could avert many tragedies. The strength of the Anger IAT may be that the person need not have insight into his or her anger. The Anger IAT may be able to help the angry individual who does not know that he or she is dangerously angry.

Finally, due to the differences in response time found regarding ethnicity of race, future research could focus on norming of races for the Anger IAT. A study that compares the differences between response latency and race could provide a different baseline and range of scores between the differing groups being analyzed. Because anger is correlated with many health concerns ethnic differences could also signal health concerns.

Conclusion

In conclusion, the construction and development of a new inventory, Anger Implicit Association Test, was described in detail. Furthermore, the validity of the Anger Implicit Association Test was demonstrated through a multitrait design which tested for construct validity. The Anger IAT was demonstrated to be a valid measure of anger that bypasses the censorship of an individual's desire to be socially appropriate. The purpose of developing a measure of anger implicitly is important because it provides an avenue to gauge an individual's thoughts and feelings when the material is socially sensitive. The ability to tap these underlying or non-conscious cognitions and emotions implicitly can help measure anger without the

possibility of an individual answering in a social desirable manner or “faking good.”

The anger IAT has several advantages over the State-Trait Anger Expression Inventory-2. First and foremost, the Anger IAT removes the issues of social desirability when measuring anger. Secondly the anger IAT is quicker to administer and scores automatically. The State-Trait Anger Expression Inventory takes approximately twice as long to administer and score. Thirdly, the Anger IAT is free from scoring error because it scores automatically. Finally, it is much more difficult to answer falsely on the Anger IAT.

Finally, it appears that the Anger IAT may be measuring current or state anger. More specifically, the results demonstrate that the Anger IAT may be measuring angry thoughts and feelings that a person is experiencing and perhaps wants to express verbally or physically.

REFERENCES

Ajzen, I., & Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behaviors. *Journal of Personality and Social Psychology, 27*, 41-57.

Aronson, E. (1995). *The social animal (7th ed.).* New York: W.H. Freeman and Company.

Averill, J. R. (1982). *Anger and aggression an essay on emotion.* New York: Springer-Verlag.

Bargh, J.A., Chaiken, S., Govender, R., & Pratto, F. (1992). The generality of the automatic attitude activation effect. *Journal of Personality and Social Psychology*, *62*, 893-912.

Bellack, A.S., & Lombardo, T.W. (1984). *Behavorial theories and treatment of anxiety*. New York. US: Plenum Press.

Biaggio, M.K. (1980). Assessment of anger arousal. *Journal of Personality Assessment, 44*, 289-298.

Biaggio, M.K., Supplee, K., & Curtis, N. (1981). Reliability and validity of four anger scales. *Journal of Personality Assessment, 45(6)*, 639-648.

Blascovich, J., & Tomaka, J. (1993). Measures of self esteem. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (3rd ed., pp. 115-160). Ann Arbor, MI: Institute for Social Research. Chapter Citation

C. Conoley (personal communication, January 2002)

C. Conoley (personal communication, 2001)

Cuellar, R., & Conoley, C. (2005). Anger implicit association test. Unpublished manuscript.

Cunningham, W.A., Preacher, K.J., Banaji, M.R. (2002). Implicit attitude measures: Consistency, stability, and convergent validity. *Psychological Science*.

Dasgupta, N., McGhee, D. E., Greenwald, A. G., & Banaji, M.R. (2000). Automatic preference for white americans: Eliminating the familiarity explanation. *Journal of Experimental Social Psychology*, *36*, 316-328.

Delprato, D. J., & McGlynn, F. D. (1984). Behavioral theories of anxiety disorders. In S. M. Turner (Ed.),

Behavioral treatment of anxiety disorders. New York: Plenum.

Evans, D.R., & Strangeland, M. (1971). Development of the reaction inventory to measure anger. *Psychological Reports*, *29*, 412-414.

Fazio, R.H. (1995). Attitudes as object-evaluation associations: Determinants, consequences, and correlates of attitude accessibility. In R.E. Petty & J.A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 247-282). Hillsdale, NJ: Erlbaum.

Fazio, R.H. (1993). Variability in the likelihood of automatic attitude activation: Data re-analysis and commentary on Bargh, Chaiken, Govender, and Pratto (1992). *Journal of Personality and Social Psychology, 64*, 753-758, 764-765.

Fazio, R.H. (1990). Multiple processes by which attitudes guide behavior: The mode model as an integrative framework. In M.P. Zanna (Ed.), *Advances in experimental social psychology.* (Vol. 23, pp. 75-109). New York: Academic Press.

Fazio, R. H., Chen, J. M., McDonel, E. C., & Sherman, S. J. (1982). Attitude accessibility, attitude-behavior consistency, and the strength of the object evaluation association. *Journal of Experimental Social Psychology, 18,* 339-357.

Fazio, R. H., Jackson, J. R. Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusivemeasure of racial attitudes: a bona fide pipeline? *Journal of Personality and Social Psychology, 69, (6),* 1013-1027.

Fazio, R.H., Powell, M.C., & Herr, P.M. (1983). Towards a process model of the attitude-behavior relation: Assessing one's attitude upon mere observation of the attitude object. *Journal of Personality and Social Psychology*, *44*, 723-735.

Fazio, R.H., Sanbonmatsu, D.M., Powell, M.C., & Kardes, F.R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology*, 50, (2), 229-238.

Fazio, R. H. & Zanna, M. P. (1981). Direct experience and attitude-behavior consistency. *Advances in Experimental Social Psychology*, *14*, 162-202.

Fazio, R. H., & Zanna, M. P. (1978). Attitudinal qualities relating to the strength of the attitude-behavior relationship. *Journal of Experimental Social Psychology,* 1978, *14*, 398-408.

Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Mellott, D. S. (2002). A unified theory of implicit attitudes, stereotypes, self esteem, and self-concept. *Psychological Review*, *109*, 3-25.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, *102*, 4-27.

Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, *79*, 1022-1038.

Greenwald, A. G., Klinger, M. R., & Liu, T. J. (1989). Unconscious processing of dichoptically masked words. *Memory and Cognition, 17,* 35-47.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. K. L. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, *74*, 1464-1480.

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*, 197-216.

Greenwald, A. G., & Nosek, B. A. (2001). Health of the implicit association test at age 3. *Zeitschrift für Experimentelle Psychologie*, *48*, 85-93.

Hepner, P.P., Kivlighan, D.M., Wampold, B.E.(1992) *Research Design in Counseling.* Pacific Grove, CA: Brooks/Cole.

Higgins, E.T., & King, G. (1981). Accessibility of social constructs: Information processing consequences of individual and context variability. In N. Cantor & J.F. Kihlstrom (Eds.), *Personality, cognition, and social interaction.* Hillsdale, N.J.: Erlbaum.

Hummert, M. L., Garstka, T. A., O'Brien, L. T., Greenwald, A. G., Mellott, D. S. (2002). Using the implicit association test to measure age differences in implicit social cognitions. *Psychology and Aging*, *17*, 482-495.

Jackson, D.N. (1967). Personality research form manual. Goshen, NY: Research Psychologist Press, Inc.

Marlowe, D., & Crowne, D.P. (1960) A new scale of social desirability independent of psychology. *Journal of Consulting Psychology*, *24(4)*, 349-354.

Novaco, R.W. (1975) *Anger control: The development and evaluation of an experimental treatment.* Lexington, MA: D.C. Heath.

Perdue, C.W., Dovidio, J.F., Gurtman, M.B. & Tyler, R.B. (1990). Us and them: Social categorization and the process of intergroup bias. *Journal of Personality and Social Psychology*, *59*, 475-486.

Perdue, C.W., & Gurtman, M.B. (1990). Evidence for the automaticity of ageism. *Journal of Experimental Social Psychology, 26*, 199-216.

Rosenberg, M. (1965). Society and the adolescent self image, Princeton University Press, Princeton, N.J.Schofield, J.W. Effects of norms, public disclosure, and need for approval on volunteering behavior consistent with attitudes. *Journal of Personality and Social Psychology,* 1975, *31*, 1126 2233.

Sarbin, T.R. (1964). The rationality of nonsense: Intensity of meaning of non-referential verbal units. *Psychological Record,* 14(4), pp 401-410.

Schofield, J. W. (1975). Effects of norms, public disclosure, and need of approval on volunteering behavior consistent with attitudes. *Journal of personality and Social Psychology, 31,* 1126-1133.

Spielberger, C.D. (1999). *State-trait anger expression inventory-2* (Professional Manual). Lutz, FL: Psychological Assessment Resources.

Spielberger, C.D. (1996). *State-trait anger expression inventory-2* (professional manual). Lutz, FL: Psychological Assessment Resources, Inc.

Spielberger, C.D. (1988). *Manual for the state-trait anger expression inventory.* Odess, FL: Psychological Assessment Resources.

Spielberger, C.D. (1983). *State-trait anxiety inventory: A comprehensive bibliography*. Palo-Alto, CA: South FL.

Spielberger, C.D. (1966). Theory and research on anxiety. In C.D. Spielberger (Ed.), *Anxiety and behavior*. New York: Academic Press.

Spielberger, C.D., Gorsuch, R.L., & Lushene, R.E., Vagg P.R., & Jacobs, G.A. (1983). *State-trait anxiety inventory (Form Y).* Redwood City, CA: Mind Garden.

Spielberger, C.D., Gorsuch, R.L., & Lushene, R.E., Vagg P.R., & Jacobs, G.A. (1970). *State-trait anxiety inventory (Self-Evaluation Questionaire)*. Palo Alto, CA: Consulting Psychologist Press.

Spielberger, C.D., Jacobs, G., Russell, S., & Crane, R.S. (1983). Assessment of anger: The state-trait anger scale. *Advances in Personality Assessment*, *2*, 161-189.

Spielberger, C.D., Vagg, P.R., Barker, L.R., Donham, G.W.,& Westberry, L.G. (1980). The factor structure of the

State Trait Anxiety Inventory. In I.G. Sarason & C.D. Spielberger (Eds.), *Stress and anxiety* (Vol. 7). New York: Hemisphere/Wiley.

Spielberger, C.D., Vagg, P.R., Barker, L.R., & Westberry, L.G. (1980). The factor structure of the state-trait anxiety inventory. In I.G. Sarason & C.D. Spielberger (Eds.), *Stress and Anxiety* (Vol. 7). New York: Hemisphere/Wiley.

Strahan, R., & Gerbasi, K.C. (1972). Short, homogeneous versions of the marlow-crowne social desirability scale. *Journal of Clinical Psychology,* 28, 191-193.

Warner, L.G., & DeFleur, M.L. (1969). Attitude as an interactional concept: Social constraint and social distance as intervening variables between attitudes and action. *American Sociological Review, 34*, 153-169.

Zanna, M. P., Olson, J. M., & Fazio, R. H. (1980). Attitude –behavior consistency: An individual difference perspective. *Journal of Personality and Social Psychology, 38,* 432-440.

Zuckerman, M. & Lubin, B. (1965). *Manual for the multiple affect adjective checklist*. San Diego, CA: Educational and Industrial Testing Service.

APPENDIX A

DEMOGRAPHIC DATA SHEET

1. Age _____
2. Gender
    a. Male _____
    b. Female _____
3. Ethnicity:
    a. Caucasian ___
    b. African-American ___
    c. Hispanic _____
    d. Asian ___
    e. Native American _____
    f. Other _____
4. Grade Level __
5. Parent’s Occupation or Self Occupation _____
6. Problems with anger:
    a. problems with family ___
    b. problems with the law _____
    c. problems with a significant other _____
    d. problems with strangers _____

APPENDIX B

STAXI-2™

Item Booklet (Form HS)

Instructions

In addition to this Item Booklet you should have a STAXI-2 Rating Sheet. Before beginning, enter your name, gender, and age; today's date; years of education completed, your marital status, and your occupation in the spaces provided at the top of the STAXI-2 Rating Sheet.

This booklet is divided into three Parts. Each Part contains a number of statements that people use to describe their feelings and behavior. Please note that each Part has *different* directions. Carefully read the directions for each Part before recording your responses on the Rating Sheet.

There are no right or wrong answers. In responding to each statement, give the answer that describes you best. DO NOT ERASE! If you need to change your answer, mark an "X" through the incorrect response and then fill in the correct one.

Examples

1. ① ● ● ④
2. ① ● ③ ④

PAR Psychological Assessment Resources, Inc. • 16204 N. Florida Ave., Lutz, FL 33549 • Toll-Free 1.800.331.TEST • www.parinc.com

9 8 7 6 5 Reorder #RO-4352 Printed in the U.S.A.

Part 1 Directions

A number of statements that people use to describe themselves are given below. Read each statement and then blacken the appropriate circle on the Rating Sheet to indicate how you feel *right now*. There are no right or wrong answers. Do not spend too much time on any one statement. Mark the answer that *best* describes your *present feelings*.

Fill in ① for *Not at all*	Fill in ② for *Somewhat*	Fill in ③ for *Moderately so*	Fill in ④ for *Very much so*

How I Feel Right Now

1. I am furious
2. I feel irritated
3. I feel angry
4. I feel like yelling at somebody
5. I feel like breaking things
6. I am mad
7. I feel like banging on the table
8. I feel like hitting someone
9. I feel like swearing
10. I feel annoyed
11. I feel like kicking somebody
12. I feel like cursing out loud
13. I feel like screaming
14. I feel like pounding somebody
15. I feel like shouting out loud

Part 2 Directions

Read each of the following statements that people have used to describe themselves, and then blacken the appropriate circle to indicate how you *generally* feel or react. There are no right or wrong answers. Do not spend too much time on any one statement. Mark the answer that *best* describes how you *generally* feel or react.

Fill in ① for *Almost never*	Fill in ② for *Sometimes*	Fill in ③ for *Often*	Fill in ④ for *Almost always*

How I Generally Feel

16. I am quick tempered
17. I have a fiery temper
18. I am a hotheaded person
19. I get angry when I'm slowed down by others' mistakes
20. I feel annoyed when I am not given recognition for doing good work
21. I fly off the handle
22. When I get mad, I say nasty things
23. It makes me furious when I am criticized in front of others
24. When I get frustrated, I feel like hitting someone
25. I feel infuriated when I do a good job and get a poor evaluation

Part 3 Directions

Everyone feels angry or furious from time to time, but people differ in the ways that they react when they are angry. A number of statements are listed below which people use to describe their reactions when they feel *angry* or *furious*. Read each statement and then blacken the appropriate circle to indicate how *often* you *generally* react or behave in the manner described when you are feeling angry or furious. There are no right or wrong answers. Do not spend too much time on any one statement.

Fill in ① for *Almost never*	Fill in ② for *Sometimes*	Fill in ③ for *Often*	Fill in ④ for *Almost always*

How I Generally React or Behave When Angry or Furious...

26. I control my temper
27. I express my anger
28. I take a deep breath and relax
29. I keep things in
30. I am patient with others
31. If someone annoys me, I'm apt to tell him or her how I feel
32. I try to calm myself as soon as possible
33. I pout or sulk
34. I control my urge to express my angry feelings
35. I lose my temper
36. I try to simmer down
37. I withdraw from people
38. I keep my cool
39. I make sarcastic remarks to others
40. I try to soothe my angry feelings
41. I boil inside, but I don't show it
42. I control my behavior
43. I do things like slam doors
44. I endeavor to become calm again
45. I tend to harbor grudges that I don't tell anyone about
46. I can stop myself from losing my temper
47. I argue with others
48. I reduce my anger as soon as possible
49. I am secretly quite critical of others
50. I try to be tolerant and understanding
51. I strike out at whatever infuriates me
52. I do something relaxing to calm down
53. I am angrier than I am willing to admit
54. I control my angry feelings
55. I say nasty things
56. I try to relax
57. I'm irritated a great deal more than people are aware of

APPENDIX C

mind garden

SELF-EVALUATION QUESTIONNAIRE
STAI Form Y-1

Please provide the following information:

Name_____Date_____S_____

Age_____ Gender (*Circle*) **M** **F** T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

Published by Mind Garden, Inc. www.mindgarden.com

SELF-EVALUATION QUESTIONNAIRE
STAI Form Y-2

Name_____ Date_____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Published by Mind Garden, Inc. www.mindgarden.com

APPENDIX D

A. Rosenberg Self-Esteem Scale

The scale is a ten-item Likert scale with items answered on a four-point scale from strongly agree to strongly disagree. The scoring for some items needs to be reversed so that in each case the scores go from less to more self-esteem. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

	Strongly Agree	agree	disagree	Strongly disagree
1. On the whole, I am satisfied with myself.				
2. *At times I think I am no good at all				
3. I feel that I have a number of good qualities				
4. I am able to do things as well as most other people				
5. *I feel I do not have much to be proud of				
6. *I certainly feel useless at times				
7. I feel that I am a person on worth, at least on an equal plane with others				
8. *I wish I could have more respect for myself				
9. *All in all, I’m inclined to feel that I am a failure				
10. I take a positive attitude toward myself				

Note: Items with an asterisk are reversed scored.

APPENDIX E

Marlowe – Crowne Social Desirability Scale (short version)

Please answer true or false for each question.

1. I never hesitate to go out of my way to help someone in trouble.
2. I have never intensely disliked anyone.
3. There have been times when I was quite jealous of the good fortune of others.
4. I would never think of letting someone else be punished for my wrong doings.
5. I sometimes feel resentful when I don’t get my way.
6. There have been times when I felt like rebelling against people in authority even though I knew they were right.
7. I am always courteous, even to people who are disagreeable.
8. When I don’t know something I don’t at all mind admitting it.
9. I can remember “playing sick” to get out of something.
10. I am sometimes irritated by people who ask favors of me.

APPENDIX F

Help out a fellow Aggie complete his dissertation

Contact

Rafael Cuellar at r-cuellar@neo.tamu.edu

Or (979)575-7290

You will asked to fill out forms that describe how you feel and think.

One test is on a computer.

Location is at Harington Tower

Duration 1.5 hours

APPENDIX G

The Validation of the Implicit Association Anger Test
Statement of Consent to Participate in Research

I understand that the purpose of this study is to investigate the validity of an implicit association test. I was selected to be a possible participant because I am a student at Texas A&M University. A total of sixty people have been asked to participate in this study.

If I agree to be in this study I will be asked to complete self-reports written and computer form. This study will only take 1.5 hours and will take place in one sitting. The risks associated with this study are possible feeling uncomfortable if I do not like reporting my anxiety, anger, and self-esteem. The benefits of the participation include the $5.00 compensation, which will be awarded at the conclusion of the questionnaires.

This study is anonymous and I am aware that I will not put my name on the forms. I will be asked to make up a name that I place on all the forms. I understand that my name will not be given out to anyone and my forms will be in a locked university office. My decision whether or not to participate will not affect my current or future relations with Texas A&M University. If I decide to participate, I am free to refuse to answer any of the questions that may make me feel uncomfortable. I can withdraw at anytime without my relations to the university being affected. I can contact Rafael Cuellar, (210) 884-4517 (longhorn_ag@hotmail.com) or Dr. Collie Conoley, 862-3879 (collie-conoley@tamu.edu).

I understand that this research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subject' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Research Compliance, Office of the Vice President for Research at (979)845-8585 (mwbuckley@tamu.edu).

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I have been given a copy of this consent form.

Signature of Subject:_____ Date:_____
Signature of Investigator:_____ Date:_____

APPENDIX H

Means and standard deviations were computed for the IAAT response error and latency, state anxiety, trait anxiety, social desirability scale, and self esteem scale.

Subject	Error	Latency	S-ANX	T-ANX	SDS	SE
1	11.25	182.55	31	47	5	16
2	5	116.625	45	38	3	22
3	12.5	325.375	49	54	5	19
4	13.75	-386.925	47	54	1	21
5	1.25	-292.7	23	50	7	14
6	1.25	294.875	21	25	9	12
7	10	417.95	42	40	1	19
8	21.25	-7.65	24	37	3	11
9	20	134.4	51	60	7	29
10	12.5	415.4	49	51	6	23
11	12.5	949.9	24	47	3	26
12	20	-206.9	34	33	6	19
13	22.5	141.6	20	51	4	24
14	13.75	1039.25	33	37	6	21
15	11.25	352.775	27	42	6	21
16	33.75	60.8	32	47	6	21
17	28.75	-321.525	40	51	2	17
18	5	235.7	52	48	2	15
19	15	-366.425	25	27	2	14
20	13.75	113.825	39	48	5	15
21	3.75	79.275	34	37	2	21
22	10	-150.225	37	41	6	19
23	13.75	1068.125	26	35	5	12
24	20	-414.375	27	53	4	26
25	28.75	-1004.525	26	33	8	13
26	27.5	540.025	37	37	7	22
27	18.75	-84.2	48	48	6	13
28	8.75	446.225	30	34	8	14
29	5	-126.925	37	28	8	18
30	7.5	409.35	27	24	8	14

31	16.25	1075.325	20	20	10	10
32	23.75	608.775	22	26	9	10
33	20	-165.5	28	32	4	19
34	18.75	433.8	25	24	9	12
35	16.25	438.975	33	35	4	16
36	21.25	456.675	22	28	7	14
37	18.75	-94.425	38	40	7	11
38	8.75	407.425	51	43	7	17
39	13.75	275.475	33	31	4	19
40	11.25	430.9	21	29	5	13
41	7.5	-500.8	30	49	3	18
42	7.5	1120.675	40	45	5	19
43	3.75	-618.675	20	51	9	14
44	12.5	27.675	29	30	6	15
45	12.5	-371.65	32	33	4	15
46	1.25	-82	29	39	5	20
47	1.25	-118.675	43	29	4	21
48	1.25	281.625	32	29	9	12
49	0	109.075	48	46	7	20
50	18.75	-386.575	32	40	6	20
51	20	-212.85	52	60	4	24
52	8.75	17.075	20	30	8	20
53	8.75	-245.825	42	35	8	18
54	21.25	-240.075	30	27	6	20
55	35	367.775	54	46	3	23
56	16.25	102.8	50	30	4	17
57	1.25	133.775	31	32	6	13
58	2.5	-233.5	24	27	5	13
59	2.5	-306.05	20	20	7	15
60	0	65.175	33	29	8	20
Mean	13	112.30083	33.6833	38.2	5.56667	17.483
STDEV	8.55192	427.10681	9.99415	10.084	2.19368	4.3185

APPENDIX I

Means and standard deviations were calculated for state anger and trait anger on the State-Trait Anger Expression Inventory-2.

	S-Ang	SAngF	SAngV	SAngP	T-Ang	TangT	TangR
	17	6	6	5	17	4	8
	19	7	6	6	24	9	12
	15	5	5	5	28	7	13
	19	9	5	5	23	11	9
	15	5	5	5	11	4	5
	15	5	5	5	13	4	7
	34	13	14	7	29	12	12
	15	5	5	5	20	8	9
	17	7	5	5	21	10	8
	25	10	10	5	16	5	8
	15	5	5	5	29	7	16
	16	5	6	5	16	4	8
	23	10	6	5	20	7	7
	17	7	5	5	15	6	7
	15	5	5	5	13	4	7
	15	5	5	5	20	6	9
	23	7	9	7	22	8	10
	36	11	15	10	35	15	13
	22	7	7	8	21	7	9
	15	5	5	5	14	4	7
	15	5	5	5	21	8	9
	15	5	5	5	15	4	9
	15	5	5	5	18	5	10
	15	5	5	5	24	10	11
	15	5	5	5	16	4	9
	18	8	5	5	12	5	6
	15	5	5	5	23	9	11
	15	5	5	5	15	6	7
	16	5	5	6	17	5	9
	15	5	5	5	14	5	7

	15	5	5	5	10	4	4
	15	5	5	5	15	5	7
	15	5	5	5	20	7	10
	15	5	5	5	13	4	7
	15	5	5	5	15	5	7
	15	5	5	5	12	4	6
	15	5	5	5	21	6	13
	21	9	6	6	23	8	10
	15	5	5	5	14	6	6
	15	5	5	5	23	8	11
	15	5	5	5	22	7	11
	15	5	5	5	11	4	5
	15	5	5	5	13	4	6
	15	5	5	5	13	4	7
	15	5	5	5	15	4	9
	15	5	5	5	20	5	12
	15	5	5	5	17	6	8
	15	5	5	5	14	5	4
	15	5	5	5	15	5	8
	15	5	5	5	15	4	4
	31	7	13	11	38	13	13
	15	5	5	5	12	5	5
	15	5	5	5	17	7	7
	21	5	9	7	19	9	6
	35	13	14	8	34	15	10
	19	6	7	6	12	4	5
	15	5	5	5	18	6	9
	15	5	5	5	15	4	8
	15	5	5	5	10	4	4
	15	5	5	5	15	8	4
Mean	17.40	5.95	5.97	5.45	18.22	6.38	8.30
SD	5.05	1.94	2.38	1.18	6.07	2.71	2.65

APPENDIX J

Means and standard deviations were calculated for anger expression-in, anger expression-out, anger control-out, anger control-in, and anger expression index on the State-Trait Anger Expression Inventory-2.

AX-O	AX-I	AC-O	AC-I	AX Index
18	15	22	26	33
18	25	17	18	56
16	25	23	24	62
16	16	8	8	64
10	9	20	11	36
10	8	32	32	2
24	21	17	16	60
17	17	16	20	46
19	18	17	16	52
13	21	31	20	31
19	27	22	21	51
18	13	30	32	17
11	13	15	19	38
14	14	29	26	21
12	15	25	17	33
15	17	16	16	48
20	17	18	13	54
26	28	22	22	58
19	18	17	13	54
15	12	28	23	24
18	20	26	25	35
12	20	28	20	32
14	14	30	25	21
16	21	16	10	59
13	14	32	27	16
23	18	14	16	59
14	15	23	25	29
21	21	26	27	37

	12	13	24	22	27
	17	13	30	22	26
	11	26	32	32	21
	12	10	30	26	14
	14	13	25	21	29
	10	17	29	26	20
	16	13	20	22	35
	10	11	32	31	6
	14	19	28	21	32
	16	21	17	20	48
	15	13	23	23	30
	18	12	26	30	22
	16	15	20	19	40
	9	18	26	19	30
	13	11	31	31	10
	8	8	32	32	0
	12	14	28	31	15
	14	18	21	17	42
	14	14	27	22	27
	11	15	29	27	18
	14	20	24	23	35
	12	14	28	31	15
	26	21	18	17	58
	13	17	30	28	20
	10	15	30	26	17
	17	14	21	20	38
	19	20	25	16	46
	8	13	16	16	40
	16	21	22	26	37
	15	14	28	21	28
	8	8	32	32	0
	14	11	23	19	31
Mean	14.92	16.23	24.12	22.28	33.08
SD	4.10	4.64	5.76	5.94	16.28

VITA

Rafael Cuellar, Jr.
1284 Farm Road 665
Alice, Texas 78332

Education

B.A., Psychology, University of Texas, 1994

M.S., Counseling Psychology, Texas A&M University-Kingsville, 1995

Ph.D.,Counseling Psychology, Texas A&M University, 2005

Presentations

Morales, P.C., Bender, S.W., Hirsch, W.M., Howze, A.R., & Cuellar, R.(1998, March). The Uganda AIDS/HIV crisis:Positive living and dying in the face of an epidemic. Paper presented at the Association for Death Education and Counseling, Chicago, Illinois.

Morales, P.C., Howze, A.R., Cuellar, R., & Hirsch, W.M. (1999, March).Quality of life in terminally ill individuals infected with HIV. Paper presented at the Association for Death Education and Counseling, San Antonio, Texas.