Exploring the Moderating Effects of Aggression on the Relationship Between Negative Urgency and Suicidal Desire

Rachel L. Martin

University of Southern Mississippi

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EXPLORING THE MODERATING EFFECTS OF AGGRESSION ON THE RELATIONSHIP BETWEEN NEGATIVE URGENCY AND SUICIDAL DESIRE

by

Rachel L. Martin

A Thesis Submitted to the Graduate School, the College of Education and Human Sciences and the School of Psychology at The University of Southern Mississippi in Partial Fulfillment of the Requirements for the Degree of Master of Arts

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ABSTRACT

Suicide is a health concern with 44,965 deaths in 2016. Typical assessment of risk factors relies on self-report, which can be susceptible to underreporting. As such, non-face valid measures and innovative assessment approaches such as implicit association tests may help identify risk factors by eliminating conscious underreporting. The Interpersonal-Psychological Theory of Suicidal Behavior is an empirically supported theory hypothesizing why individuals die by suicide. The theory comprises three elements: thwarted belongingness, perceived burdensomeness, and capability for suicide. Thwarted belongingness and perceived burdensomeness have been found to be non-face valid measures and less susceptible to conscious underreporting. Objective measures, such as Implicit Association Tests (IATs), can be used to attenuate the problems of self-report. Previous self-report studies have found that impulsivity and aggression interact to increase suicide risk, whereas other research does not. Additionally, other work has emphasized the need to examine lower order factors of impulsivity and aggression to more precisely determine this link. This study sought to add to the literature by examining if the interaction between aggression (relational, physical, and implicit) and negative urgency (a facet of impulsivity) is associated with suicidal desire (i.e., thwarted belongingness and perceived burdensomeness). I hypothesized that aggression would moderate this relationship and an increase in aggression would be associated with an increase in suicidal desire. The hypotheses were not supported, with non-significant results for all analyses. Exploratory analyses indicated that there was no correlation or association between the self-reported aggression and implicit aggression. The implications and the importance of utilizing multiple methodologies in research are discussed.
ACKNOWLEDGMENTS

I cannot express enough thanks to my mentor, Dr. Dan Capron, who continually challenges me to think critically and to become an analytical scientist. Without that, this project would not have been completed. I would also like to thank my committee members, Dr. Michael Anestis and Dr. Stephanie Smith for contributing their expertise to this project.
DEDICATION

I would like to dedicate this document to my family for their continued support throughout my education. Thank you, mom, dad, and Leslie, for your encouragement throughout this process. Finally, thank you Brian for your unwavering love and patience while I strive to be as smart as you think I am.
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<tr>
<td>Agg-IAT</td>
<td>Aggression Implicit Association Test</td>
</tr>
<tr>
<td>IAT</td>
<td>Implicit Association Test</td>
</tr>
<tr>
<td>ITS</td>
<td>Interpersonal-Psychological Theory of Suicidal Behavior</td>
</tr>
<tr>
<td>PB</td>
<td>Perceived Burdensomeness</td>
</tr>
<tr>
<td>SRSBM</td>
<td>Self-Report of aggression &amp; Social Behavior Measure</td>
</tr>
<tr>
<td>TB</td>
<td>Thwarted Belongingness</td>
</tr>
<tr>
<td>UPPS-P</td>
<td>Urgency Premeditation Perseverance Sensation Seeking Impulsive Behavior Scale</td>
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CHAPTER I - INTRODUCTION

Suicide is a growing health concern with 44,965 deaths in the United States in 2016 (CDC, 2018). In an attempt to understand why some individuals die by suicide, researchers have examined factors through a number of lenses including biological (Oquendo et al., 2014), sociological (Durkheim, 1897), and psychological (Beck, Steer, Kovacs, & Garrison, 1985; Joiner, 2005; Schneidman, 1993). One of the primary theories within the current psychological lens is the Interpersonal-Psychological Theory of Suicidal Behavior (ITS; Joiner, 2005), which posits that individuals must have three components to die by suicide: thwarted belongingness (the belief that the individual lacks meaningful and reciprocal relationships with others), perceived burdensomeness (the belief that others would benefit more from their death than their life), and capability (the ability to complete a suicide attempt measured by heightened pain tolerance and fearlessness about death). Moreover, the theory suggests that individuals experience suicidal desire when both thwarted belongingness and perceived burdensomeness are present (Van Orden et al., 2010). Suicidal desire is correlated with suicidal ideation but is composed specifically of thwarted belongingness and perceived burdensomeness.

Research has found that utilizing thwarted belongingness and perceived burdensomeness as non-face valid indicators of suicidal ideation may be more accurate for detecting suicidal ideation than measures that explicitly reference suicidal thoughts (Anestis, Mohn, Dorminey, & Green, 2017). Under reporting is a key issue in suicide research where individuals may fear repercussions for disclosing their suicidal thoughts (Blocker & Miller, 2013). Data on suicide risk factors are primarily collected through face valid, self-report measures. Utilizing self-report and/or face valid measures to examine undesirable traits or sensitive
topics can be especially vulnerable to an individual underreporting their symptoms (Vannoy et al., 2017). As such, incorporating non-face valid measures and new methodologies that are less susceptible to under-reporting should be utilized in suicide research.

Implicit Association Test

The problems of self-report can be attenuated by incorporating an Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). The IAT examines the strength of automatic associations (Greenwald, Nosek, & Banaji, 2003). The IAT is a computer-based sorting task that measures the automatic associations through stimulus words and target categories. The test is scored using reaction time and accuracy of the sorted stimulus words with the premise being that a more implicit association between words would be reflected in a quick and accurate response (Baron & Banaji, 2006; Greenwald et al., 1998). There has been an increase of IATs in research due to its ability to access participants’ attitudinal unconsciousness, which participants may not be able to verbalize or express with self-report surveys (Greenwald et al., 2003). Additionally, IAT demonstrates strong psychometric properties and overcomes reliability problems better than other implicit paradigms (Bar-Anan & Nosek, 2014; Greenwald et al. 1998).

IATs are used to gather underlying feelings that cannot be assessed through self-report surveys, which could result in more accurately determining suicide risk due to the potential for underreporting symptoms for various reasons (e.g. shame, fear of hospitalization, stigma). In previous research, IATs have been able to reliably measure different personality traits such as shyness (Asendorpf, Banse, & Mücke, 2002), anxiety (Egloff & Schmuckle, 2002), and aggressiveness (Richetin, Richardson, & Manson, 2010). Aggression IATs have been used to examine underlying feelings of aggression in
individuals diagnosed with OCD (Cludius, Schmidt, Moritz, Banse, & Jelinek, 2017) and predict aggressive acts in ice hockey and volleyball players (Banse et al., 2015), yet none have used it as a variable to examine suicidal desire.

Additionally, a suicide IAT has been used in a clinical setting to predict those who previously attempted suicide (Nock et al., 2010). Similarly, a self-injury IAT has been used to predict current suicidal ideation, attempt status, and future suicidal ideation amongst adolescents (Nock & Banaji, 2007). Although suicide-specific IATs have been utilized in suicide research, there is a lack of research adapting the IAT to undesirable traits to examine suicidal desire. Utilizing an IAT for undesirable traits and measuring suicidal desire through non-face valid measures (e.g., thwarted belongingness and perceived burdensomeness), may decrease some of the biases that occur with explicit measures in suicide research.

Impulsivity

One undesirable suicide risk factor that may be prone to underreporting is impulsivity. Research on the association between impulsivity and suicide indicates a strong link between these two variables (Horesh et al., 1997; Moussas, Dadoutis, Botsis, Lykouras, 1999). Although this relationship has been empirically tested and supported, researchers have conceptualized impulsivity in a variety of ways, which led to the belief that it was a heterogeneous variable (Miller, Flory, Lynam & Leukefeld, 2003). This research became more focused with the development of the Urgency Premeditation Perseverance Sensation Seeking Impulsive Behavior Scale (UPPS-P; Whiteside and Lynam, 2001), in which different facets of impulsivity emerged. The development of the UPPS-P allowed for more precise research to be done on the different components of impulsivity. An aspect of impulsivity that has been shown to be related to suicide risk is
negative urgency, which can be described as the propensity to act impulsively when distressed (Settles et al., 2012).

Research regarding negative urgency has shown that it is associated with non-suicidal self-injury and suicide attempts (Anestis & Joiner, 2011; Anestis et al., 2012; Peterson, Davis-Becker, & Fischer, 2014). Specifically, it has been hypothesized that negative urgency increases ITS variables (Anestis & Joiner, 2011). Furthermore, the same study indicated that for participants who had greater than mean levels of negative urgency, ITS variables were significantly associated with lifetime suicide attempts above and beyond the effects of differences in sex and depressive symptoms (Anestis & Joiner, 2011).

Additionally, there has been literature examining how negative urgency is a dispositional contributor to aggression (Carlson, Pritchard, & Dominelli, 2013; Miller, Flory, Lynam, & Leukefeld, 2003; Miller, Zeichner, & Wilson, 2012; Settles et al., 2012; Zapolski, Stairs, Settles, Combs, & Smith, 2010) and increased violent acts (Dvorak, Pearson, Kuvaas, 2013; Grimaldi, Napper, & LaBrie, 2014). To illustrate, in a study of general interpersonal aggression, although all impulsivity dimensions within the UPPS-P (i.e., negative urgency, sensation seeking, lack of premeditation, and lack of perseverance) were correlated with aggression, only negative urgency predicted self-reported aggression (Miller et al., 2003). Research on aggression has identified multiple subfactors (e.g., reactive aggression and proactive aggression) under two overarching constructs; relational and physical aggression (Linder, Crick, & Collins, 2002). Although negative urgency has been related to aggressive actions and traits, there is a lack of research examining negative urgency’s association with specific factors of aggression (e.g., relational and physical).
A meta-analysis of all UPPS-P traits indicated that negative urgency had significant effect sizes ($p < .001$) relating to a variety of maladaptive traits, such as suicidality ($r^2 = .25$) and aggression ($r^2 = .31$; Berg, Latzman, Bliwise, Lilienfeld, 2015). Within this study, aggression was conceptualized through behavioral reports, self-report questionnaires, and/or semi-structured interviews without separating physical and relational aggression (Berg et al., 2015). Separating physical and relational aggression is important in understanding the functionality of the action and details into the types of aggression that can increase suicide risk. Similarly, Berg and colleagues (2015) operationalized suicidality as a mix of suicidal ideation and suicide attempts. By collapsing suicidal ideation and suicide attempts researchers cannot differentiate between individuals who may think about suicide in times of crisis and those who act upon those thoughts. Previous research indicates that in a clinical setting of depressed patients there were differences (e.g., personality traits, psychopathological characteristics, and sociodemographic factors) between those who think about suicide and those who attempt (Lewitzka et al., 2017). Although the results from Berg and colleagues’ (2015) meta-analysis indicate overall associations between aggression and suicidality, additional examination into the specific factors of aggression and suicide risk is needed.

Aggression

The data surrounding the association between impulsivity and aggression in predicting suicidality is mixed. There is support for (McGirr et al., 2008, McGirr & Turecki, 2007; Turecki, 2005) and against (Critchfield, Leavy & Clarkin, 2004) significant relations. Other researchers have hypothesized that the disconnect in this research could be due to the treatment of aggression and impulsivity as homogeneous measures (Giegling et al., 2009). Impulsivity, measured through negative urgency, has
been related to different forms of externalizing behavior such as anger and aggression (Krueger, Markon, Patrick, Benning, & Kramer, 2007). Specifically, negative urgency is consistently and positively associated with aggression (Berg et al., 2015).

Aggression is a major social problem that affects a variety of populations including children, (Kawabata, 2016; Raine et al., 2016), intimate partners (Weiss et al., 2017; Weiss et al., 2016), the military (Crocker, Haller, Norman, Angkaw, 2016; Martin et al., 2017), and college students (Barnett & Powell, 2016; Thompson, Kingree, Zinzow, Swartout, 2015). Different forms of aggression have been linked to suicide attempts, suicidal ideation (Fite, Stoppelbein, Greening, & Preddy, 2011), and risk factors for suicide (Hellmuth, Stappenbeck, Hoerster, Jakupcak, 2012) in different populations. Previous research has consistently demonstrated an association between reactive aggression and suicide across multiple populations (Conner, Duberstein, Conwell, & Caine, 2003; Swogger, Walsh, Maisto, & Conner, 2014). Previous research found that those who died by suicide were higher on reactive aggression and spontaneous aggression than controls or those who died by accidental means (Angst & Clayton, 1998). These results are supported by Renaud and colleagues’ (2008) study examining adolescent suicides with those who died by suicide having higher reactive aggression scores.

A preliminary meta-analysis indicates a similar trend in the relationship between reactive aggression and suicidal ideation (Hartley, Pettit, Castellanos, 2017). Despite extensive research on reactive aggression and suicide risk, there is a small portion of research that examines how overt and covert aggression can lead to suicidal desire. In one study, research on outwardly directed aggression was associated to suicide attempts, yet not suicidal ideation (Swogger, Van Orden, & Conner, 2014). On the other hand, another study found that relational aggression was linked to depressive symptoms and suicidal
ideation (Fite, Stoppelbein, Greening, & Preddy, 2011). Furthermore, there is a lack of research examining how overt and covert aggression are associated with thwarted belongingness and perceived burdensomeness. The current project seeks to examine both overt and covert aggression to further determine the extent to which each relate to suicidal desire.

An empirically supported measure of both physical aggression and relational aggression is the Self-Report of Aggression & Social Behavior Measure (SRASBM; Linder, Crick, & Collins, 2002). Physical aggression and relational aggression can be conceptualized as overt and covert, respectively. Overt physical aggression uses force to assert dominance while covert relational aggression targets social status or interpersonal relationships (Lento-Zwolinski, 2007). The link between impulsivity and overt aggression has been established (Hatfield & Dula, 2014); however, less research has been dedicated to understanding the association between impulsivity and covert aggression. One study examining negative urgency and reactive aggression in an undergraduate sample found that negative urgency moderated the relationship of being the perpetrator of relational aggression and consequences (Grimaldi et al., 2014). Furthermore, committing relational aggression was more strongly related to consequences for those with higher levels of negative urgency (Grimaldi et al., 2014). Although previous research has linked negative urgency to both overt and covert aggression, no studies have extended to look at how these relations impact suicide risk, specifically suicidal desire. Moreover, no study has tested this relationship using implicit measures.

Advancements in aggression research have focused around cognitive foundations of aggressive behavior (Banse, Messer, Fischer, 2015). For example, multiple theories on aggression incorporate cognition as a fundamental process (Berkowitz, 1989; Zillmann,
1988) and the important role schemas play in aggressive behavior (Huesmann, 1988; Huesmann & Guerra, 1997). Research on cognitive functions identified salient differences in aggressive individuals’ thoughts such as perception of uncertain behavior of others to be malicious or hostile (Dodge, 1980), beliefs and mindsets that are more encouraging of aggressive behavior (Guerra, Huesmann, & Hanish, 1995), and greater inclination to use aggressive behavior scripts (Huesmann, 1988). Despite these findings, using self-report surveys in trait aggression research can be limiting. Since aggression is an undesirable trait, there are two major limitations to self-report surveys (Greenwald & Farnham, 2000). First, individuals may underreport their trait aggressive behavior to present themselves as peaceful individuals. Second, aggressive individuals may have limited reflective knowledge as to their aggressive behavior and its source.

These problems highlight the need to incorporate other methodologies that can combat the potential biases of self-report. These problems indicate a need to focus research on automatic processes in aggressive behavior. Implicit association tests, which examine individual’s underlying perceptions of self, may mitigate the problems of self-report measures of aggression. Due to the research indicating relations between negative urgency, aggression, and suicide risk, the author hypothesized that aggression will significantly moderate the association that negative urgency has with thwarted belongingness and perceived burdensomeness, in which an increase in aggression will increase suicidal desire. Furthermore, examining the interaction of negative urgency and aggression to specific suicidal desire variables will provide further insight to the specific link that negative urgency and aggression have to suicidality.
Hypothesis

Based on the literature, incorporating implicit and non-face valid explicit measures can help extend past the potential biases of self-report to accurately assess aggression. The primary aim of this study is to examine how implicit and explicit measures of aggression moderate the relationship between negative urgency and suicidal desire. For example, an individual who has high levels of negative urgency and aggressive traits may behave erratically or damage their interpersonal relationships when distressed (e.g., when in a fight with their partner the individual may act aggressively and damage the relationship). It is hypothesized that both implicit aggression measured through the IAT and explicit aggression measured through the SRASBM will moderate the relationship between negative urgency and the suicidal desire described in the ITS (i.e., perceived burdensomeness and thwarted belongingness). Such that, with higher levels of aggression, there will be a stronger relationship between negative urgency and suicidal desire. If the hypothesis is supported, this study could assist in developing upstream interventions to decrease aggression prior to development of suicidal desire and potentially suicide attempts.

Exploratory Analyses

In addition to my primary hypothesis, there are exploratory analyses to further investigate the utility of the aggression IAT. The first exploratory analysis examines the differences between the levels of aggression on a self-reported measure as compared to the objective IAT measure. I hypothesize that there will be a significant difference between the self-reported aggression and IAT scores with higher aggression scores on the implicit test than self-reported. Since aggression is an undesirable trait, I expect the participants to underreport their levels of aggression on explicit measures. The last
exploratory analysis is to examine whether covert or overt self-reported aggression is more closely related to IAT scores. I hypothesize that the relational aggression subscale of the SRASBM will be more closely related to the scores of the aggression IAT than the physical aggression subscale. This is hypothesized because relational aggression is more closely associated with covert aggression while physical aggression can be associated with overt. By examining suicidality through the ITS variables of thwarted belongingness and perceived burdensomeness, researchers can identify what interventions would be best to help decrease overall suicidal desire.
CHAPTER II - METHOD

Participants and Procedure

Participants (N=116) were undergraduates recruited from The University of Southern Mississippi’s SONA program. Participants were primarily 21 years old (SD 6.12), female (79.3%), African American, (60.3%), earned between $25,001 - $50,000 (54.3%) were never married (92.2%), and lived with a roommate of the same sex (55.2%). Further demographic information can be found in Table 1.

Table 1 Demographic Information

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>116</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>21.55 (6.12)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Female (Male)</td>
<td>79.3% (20.7%)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>60.3%</td>
</tr>
<tr>
<td>White</td>
<td>33.6%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1.7%</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>1.7%</td>
</tr>
<tr>
<td>Native American</td>
<td>1.7%</td>
</tr>
<tr>
<td>Other</td>
<td>0.9%</td>
</tr>
<tr>
<td><strong>Socioeconomic Status</strong></td>
<td></td>
</tr>
<tr>
<td>$25,000 or less</td>
<td>26.7%</td>
</tr>
<tr>
<td>$25,001 - $50,000</td>
<td>54.3%</td>
</tr>
<tr>
<td>$50,000 or more</td>
<td>38.8%</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td>92.2%</td>
</tr>
<tr>
<td>Active Marriage</td>
<td>5.2%</td>
</tr>
<tr>
<td>Separated</td>
<td>0.9%</td>
</tr>
<tr>
<td>Divorced</td>
<td>0.9%</td>
</tr>
<tr>
<td>Widowed and not remarried</td>
<td>0.9%</td>
</tr>
<tr>
<td><strong>Living Situation</strong></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>28.4%</td>
</tr>
<tr>
<td>Significant Other</td>
<td>12.1%</td>
</tr>
<tr>
<td>Same-Sex Roommate</td>
<td>55.2%</td>
</tr>
<tr>
<td>Different-Sex Roommate</td>
<td>4.3%</td>
</tr>
</tbody>
</table>
Participants were compensated with 4.5 SONA credits for the one and a half hour the study and were eligible to participate if they could read English, were USM undergraduates, at least 18 years old, and could provide informed consent. Participants were ineligible to participate if they had uncorrected sight impairment (i.e., no corrective lenses), could not use a keyboard, and could not look at a computer screen for 10 minutes without breaks. Due to the IAT’s focus on reaction time, participants completed the IAT first. Participants then completed a self-report questionnaire online using a laboratory computer.

Measures

*Predictor and Moderator Variables*

*Urgency Premeditation Perseverance Sensation Seeking Impulsive Behavior*

*Scale-Negative Urgency* (UPPS-P; Whiteside & Lynam, 2001; Lynam, Smith, Whiteside, & Cyders, 2006). Negative Urgency is a 12-item subscale that measures how impulsively an individual acts when distressed. The Negative Urgency is a self-report survey rated on a Likert scale from 1 (*strongly agree*) to 4 (*strongly disagree*). Questions from this scale include, “I have trouble controlling my impulses” (reverse scored) and “Sometimes when I feel bad, I can’t seem to stop what I am doing even though it is making me feel worse” (reverse scored). The UPPS-P has been used before in undergraduates (Anestis, Bagge, Tull, & Joiner, 2011; Seibert et al., 2010) and in studies that examined how impulsivity predicted different forms of aggression (Derefinko, DeWall, Metze, Walsh, & Lynam, 2011; Lynam & Miller, 2004; Miller, Flory, Lynam, & Leukefeld, 2003). Additionally, Negative Urgency has been found to have substantial predictive validity for suicidal behavior and non-suicidal self-injury with risk factors such as borderline personality disorder providing no additional predictive utility (Lynam, Miller, Miller, Bornovalova,
Within this study, reliability of Negative Urgency was good, with an alpha coefficient of .89.

**Self-Report of Aggression & Social Behavior Measure (SRASBM; Linder, Crick, & Collins, 2002).** The SRASBM is a 56 item self-report survey that measures relational aggression (16 items), physical aggression (6 items), relational victimization (9 items), physical victimization (6 items), exclusivity (8 items), and prosocial behavior (11 items). In this study, only the relational (“My friends know that I will think less of them if they do not do what I want them to.”) and physical aggression (“I try to get my own way by physically intimidating others.”) subscales were administered. Previous research has used selected subscales in lieu of the entire measure with strong reliability (Chen, Coccaro, Jacobson, 2012; Lento-Zowlinski, 2007; Linder et al., 2002; White, Gordon, & Guerra, 2015). Participants were asked to respond to questions on a Likert scale from 1 (Not at All True) to 7 (Very True) regarding their adult social interactions, close relationships, and romantic relationships. This scale has been validated in a variety of samples including college students (Bailey & Ostrov, 2008; Murray-Close, Ostrov, Nelson, Crick, Coccaro, 2010; Ostrov & Houston, 2008). Cronbach alpha coefficients for relational and physical aggression were acceptable (α=.82 and α=.79 respectively).

**Aggression Implicit Association Test (Agg-IAT; Greenwald et al., 1998; Greenwald & Farnham, 2000).** The Agg-IAT was programmed and delivered through the FreeIAT program (Meade, 2009), an open-source software which has been previously utilized in IAT research (Bockers, Roepke, Michael, & Renneberg, 2015; Britt & Jennings, 2016; Cherkaoui & Gilbert, 2017; Sakaluk & Milhausen, 2011). The Agg-IAT measures the participant’s unconscious association of either self or others with aggression through a computer task in which participants are asked to sort stimulus words into
categories. The strength of the associations are measured through speed and accuracy of categorizations of stimulus items into the sorting conditions (Nosek, Greenwald, & Banaji, 2005; Uhlmann & Swanson, 2004). In this Agg-IAT there were two contrasting target categories (*Me* or *Others*) and two contrasting categories (*Aggressive* or *Peaceful*) that the participants sorted the stimuli into. A meta-analysis examining the association between IATs and explicit measures indicated that overall there is a weak correlation between these methodologies (*r*=.24; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005).

The words used in this IAT were modeled after an aggression-IAT used to measure trait features (Banse et al., 2015). Due to the less than ideal internal consistency of the model IAT (α=.66 and α=.73), in this study the words in all of the categories except for “self” were altered for clarity. In their study, Banse and colleagues (2015) used different professions as their “other” words. Since this is a college sample with a variety of potential professions, pronouns were used.

### IAT Stimuli for Current Study

The readability of the peaceful words used by Banse and colleagues (2015; amicable, conciliatory, indulgent, peaceful, reconcilable) were assessed through the Gunning FOG index and all except “peaceful” were given a score of 40.4, significantly higher than the college graduate level score of 17 (peaceful was rated .4, which is less than 6th grade reading level). To correct this, a survey of 16 individuals who were either enrolled in a psychology graduate program or graduated with a bachelor’s degree in psychology were surveyed. Participants were volunteers who were asked to identify 5 words they would most easily associate with “peaceful”, with higher scores indicating more votes. The words selected were taken from the top 10 and deemed most
recognizable at an undergraduate level ($m = 8.8$ votes, $SD = 4.76$ votes). Finally, the author consulted with a subject matter expert (Dr. Stephanie Smith) to select aggressive words to more accurately reflect trait aggression. The Me-Other categories had words related to Self (e.g., I, me, mine, my, and self) and Others (e.g., they, them, their, theirs, and others). In the Aggressive-Peaceful category there were adjectives related to Aggression (e.g., threatening, aggressive, attack, hostile, and abusive) and Peaceful (e.g., calm, gentle, peaceful, agreeable, and kind). The FreeIAT program utilizes the Greenwald, Nosek, and Banaji (2003) scoring algorithm to produce an overall IAT score. Additionally, scores using the first half of the stimuli from stages 3 and 5 (test stages) and scores using the second half of the stimuli from stages 3 and 5 were correlated to provide an estimate of internal consistency. There was good internal consistency within this sample, with a significant moderate positive correlation ($r = .477$, $p < .001$).

IAT Administration and Scoring

The category labels were presented at the top left and the top right of the screen and the category words were presented in the center. The participants were directed to correctly sort the words according to the instruction block. First, there were practice blocks to allow the participant to acclimate themselves to the system. In the practice tests, participants matched the Self ($I$, $me$, $mine$, $my$, and $self$) and Other ($they$, $them$, $their$, $theirs$, and $others$) words to their respective categories. In another block, participants also sorted the Aggression ($threatening$, $aggressive$, $attack$, $hostile$, and $abusive$) and Peaceful ($calm$, $gentle$, $peaceful$, $agreeable$, and $kind$) words. This allowed the participants to associate the words with the correct label. If incorrect, there was an “X” on the bottom of the screen and the participants needed to put the word into the correct label before moving on. Participants were asked to complete the task as fast and as accurately as
possible. A research assistant was in the room with the participant, monitoring progress and prompting if necessary.

Data Analytic Procedure

To test the main hypothesis, a series of moderations utilizing the PROCESS macro system were run (Hayes, 2012). There were six moderations applying 5,000 bootstrap samples. Significant moderation analyses were further examined through simple slopes analyses. Simple slopes allow for examination of the interaction at +/- one standard deviation away from the mean and mean levels of the moderating variable. Examination of simple slopes aids in interpretation of the results. To test exploratory hypotheses, the relationship between the SRASBM subscales and Agg-IAT were then examined through correlations, comparing the z scores of each of the subscales of the SRASBM to the z score of the Agg-IAT.

Covariates

Descriptive statistics and correlations were conducted to assess interrelatedness of the study variables (Table 2). Current research examining the INQ suggests that to fully examine each construct independently, researchers should include the variable not in the primary analysis as a covariate (Forrest et al., 2016; Hill & Pettit, 2012; Martin et al., 2017). Within this sample, thwarted belongingness and perceived burdensomeness were significantly correlated ($r = .246, p < .001$), bolstering the support for covarying. Additional covariates in the analyses were selected using empirical and theoretical methods. Demographic variables that were significantly correlated with either the predictor or outcome variables were used (Table 2). Additionally, trait anger ($r = .88$), a variable associated with aggression, was significantly correlated with the primary analysis variables and therefore included as a covariate.


**Tests of Normality**

Outcome variables violated Kolmogorov-Smirnov and Shapiro-Wilk tests for normality ($ps<.001$). Further examination of these variables indicated positively skewed and leptokurtic data (thwarted belongingness ranged from 6 to 28; perceived burdensomeness ranged from 9 to 46)\(^1\). Data were rank transformed using Blom’s formula to better assess for normality (transformed thwarted belongingness ranged from -2.19 to 2.33; perceived burdensomeness ranged from -1.61 to 2.54).\(^2\)

**Power Analysis**

Previous literature suggests that Agg-IAT detects differences at a small effect size for general aggression (Cludius et al., 2017; Teubel, Asendorpf, Banse, Schnabel, 2011) yet a large effect size for trait aggression (Base et al., 2015). Since there is a discrepancy in the literature, a medium effect size was utilized to determine sample size. An a priori power analysis was conducted through Gpower to identify the target number of participants (Faul, Erdfelder, Buchner, & Lang, 2009). Gpower indicated that a total sample size of 107 participants would be needed to detect a medium effect size ($f^2 = .15$), power at 95%, and $\alpha$ error probability at .05.

---

\(^1\) Variables were considered skewed if their skewness was greater than 2.

\(^2\) Data were also run using non-transformed data with no change in directionality or significance of analyses
Descriptive statistics and correlations among study variables are presented in Table 2. Consistent with previous literature, there was a significant association between thwarted belongingness and perceived burdensomeness ($r = .246, p < .001$). Additionally, there was a significant correlation between relational and physical aggression ($r = .638, p < .001$); however, the IAT did not correlate with either relational ($r = .131$) or physical ($r = .058$) aggression. According to previous research (Banes et al., 2015; Hofmann et al., 2005), the lack of correlation is acceptable and demonstrates utility of the implicit measure.
<table>
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<td>0.01</td>
<td>27.55</td>
<td>-0.31</td>
<td>1.13</td>
<td>1.44</td>
<td>1.85</td>
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<td>0.97</td>
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<td>1.00</td>
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</table>

Note: * = significant at the p < .05 level; ** = significant at the p < .01 level; TB= Thwarted belongingness; PB= Perceived burdensomeness; SES = socioeconomic status
Primary Analyses

*IAT as the Moderator*

Due to participants missing full scale scores for some variables, the number of participants included in each analysis differed slightly. There were 90 participants examined in these analyses. There was a non-significant overall model for when IAT score was the moderator of the relationship between negative urgency and thwarted belongingness. Additionally, the interaction of the IAT and negative urgency was not significantly associated with thwarted belongingness. Results can be found in table 3. When perceived burdensomeness was the dependent variable, there was a significant overall model. Yet, the interaction of IAT and negative urgency was not significantly associated with perceived burdensomeness. The results can be found in table 4.
Table 3 Negative Urgency as a moderator between IAT and Thwarted Belongingness

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<th>$R^2$</th>
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<th>$B$</th>
<th>$SE$</th>
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<td>.07</td>
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Table 4 Negative Urgency as a moderator between IAT and Perceived Burdensomeness

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Relational Aggression as the Moderator

Due to missing data, there were 86 participants examined in these analyses. There was a non-significant overall model for relational aggression moderating the relationship between negative urgency and thwarted belongingness. Furthermore, the interaction of relational aggression and negative urgency was not significantly associated with thwarted belongingness. Results are further described in table 5. The overall model predicting perceived burdensomeness was significant. Although the model was significant, the interaction of negative urgency and relational aggression was not significantly associated with perceived burdensomeness. Results can be found in table 6.
Table 5 *Negative Urgency as a moderator between Relational Aggression and Thwarted Belongingness*

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Table 6 *Negative Urgency as a moderator between Relational Aggression and Perceived Burdensomeness*

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<td>.64</td>
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</table>
Physical Aggression as the Moderator

There were 88 participants who were included in these analyses. There was a nonsignificant overall model predicting thwarted belongingness. Additionally, the interaction of physical aggression and negative urgency was not significantly associated with thwarted belongingness. Statistics are provided in table 7. When predicting perceived burdensomeness, the overall model was significant ($F(5,82)=10.41, p<.001, \ R^2=.38$). Nevertheless, the interaction of negative urgency and physical aggression did not contribute to the association with perceived burdensomeness ($F(1,81)=0.15, p=.70, \ \Delta R^2=.001, f^2=.001$). Results can be found in table 8.
Table 7 *Negative Urgency as a moderator between Physical Aggression and Thwarted Belongingness*

<table>
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<th>$\beta$</th>
<th>$SE$</th>
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Table 8 *Negative Urgency as a moderator between Relational Aggression and Perceived Burdensomeness*

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Exploratory Analyses

**Relationship between Aggression variables**

Both relational aggression and physical aggression violated the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality ($p < .001$), yet overall IAT scores were normally distributed. To examine how the IAT aggression relates to overt and covert aggression, correlations between relational aggression, physical aggression, and the IAT were examined. Prior to correlations, z-scores were computed to create a standardized score for comparison. Z-score correlations can be found in Table 9. There were no significant correlations between overt or covert aggression and the IAT. A hierarchical linear regression was conducted to examine if either relational or physical aggression could predict an individual’s IAT scores. Neither relational nor physical aggression were significant predictors ($p > .24$). Results can be found in Table 10. To further test the exploratory analysis, a MANOVA was conducted to examine the association that relational and physical aggression have on predicting IAT scores. There was not a statistically significant difference in aggression types on individual’s IAT score, $F(102, 1)=2.05, p=.51$, Wilk’s $\Lambda=.005$. Overall, there were no significant differences associating one facet of aggression to the IAT score.
Table 9 *Correlations between different forms of aggression*

<table>
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**Note:** The correlation coefficient for Physical Aggression and Relational Aggression is significant at the .05 level.
Table 10 *Hierarchical multiple regression analyses examining the association between relational and physical aggression to IAT scores*

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CHAPTER IV – DISCUSSION

Literature on the relationship between general impulsivity, aggression, and suicide risk is unclear with support for (McGirr et al., 2008, McGirr & Turecki, 2007) and against (Critchfield et al., 2004) the connection. The conflicting literature highlighted a need to examine specific components of impulsivity, aggression, and suicidality. Impulsivity, specifically negative urgency, has been linked to aggression (Miller et al., 2003) and suicidality (Berg et al., 2015) and previous studies have postulated that aggression and negative urgency would result in maladaptive behaviors (Berg et al., 2015). Yet there is a lack of studies examining these variables in a single model. This study sought to expand upon the literature by examining if the interaction of negative urgency and aggression would be associated with suicidal desire variables. Because aggression is an undesirable trait and prone to participants’ under-reporting, this study also sought to examine aggression through an implicit association test.

I hypothesized that self-reported relational and physical aggression as well as implicit aggression would moderate the relationship in which higher levels of aggression would increase feelings of thwarted belongingness and perceived burdensomeness. The primary results were non-significant, indicating that the interaction of negative urgency and the different forms (e.g., self-report relational and physical aggression and implicit trait aggression) of aggression were not significantly associated to either suicidal desire variables. Perhaps, college students who experience negative urgency and aggression experience other risk-taking behaviors (e.g., binge drinking or promiscuous sex) without feeling alienated from their support system. Future longitudinal research should examine if risk-taking behaviors during college years results in future suicidality.
As expected, self-reported physical aggression was highly correlated with self-reported relational aggression. Contrary to our hypotheses for the exploratory analyses, there were no associations between the implicit aggression scores and either/or physical and relational aggression; however, this is in accord with previous research indicating that primarily IATs have weak correlations with explicit measures (Hofmann et al., 2005). Similarly, it has been hypothesized that regarding the correlation between IATs and explicit measures, “very high correlations appear to be more problematic for the usefulness of indirect measure than low correlations” (Banse et al., 2015, p. 16). Therefore, the lack of correlation may indicate that the IAT measures aggression in a way self-report does not. Additionally, when examining the relationship between explicit and implicit aggression, there was a non-significant regression analysis, indicating that neither relational nor physical aggression were associated with implicit aggression. One possible explanation to these results would be that the IAT examines how the individual perceives him or herself. If an individual acts in a verbally aggressive way but sees themselves as “honest” or “straightforward”, they may not have accurate IAT scores. This difference may be a key factor in identifying why these measures are not as similar as hypothesized. Finally, results did not indicate that IAT scores would be associated with different forms of aggression. Initially, it would appear as though the current results indicate a flaw in the Agg-IAT given that previous IATs have been used to predict behavior (Nock et al., 2007; Nock et al., 2010); however, the current study is a cross-sectional design and the physical and relational aggression questionnaires assess past behavior. Future research utilizing the IAT should examine participants’ behavior longitudinally to determine if the IAT predicts future behavior.
Despite null results, the current study expands upon the literature of negative urgency, aggression, and suicidal desire. The sample of primarily African American college students is meaningful since it is an understudied population. The data is unique, namely because of the skewness of both perceived burdensomeness and thwarted belongingness. Previous literature on populations who tend to under report symptoms of suicidality indicate skewness with perceived burdensomeness (Pennings, Finn, Houtsma, Green, & Anestis, 2017; Butterworth, Green, & Anestis, 2018); however, in studies of college students perceived burdensomeness has (Lockman & Servaty-Seib, 2016) and has not (Ream, 2016) been skewed. One hypothesis for the skewness of perceived burdensomeness and thwarted belongingness in this sample is that the African American community is typically collectivist in nature with natural sociodemographic protective factors (Carson, 2009; Komarraju & Cokley, 2008). Additionally, socioeconomic status was significantly negatively correlated with perceived burdensomeness, but not significantly associated with thwarted belongingness. This relationship may be explained by the sample being undergraduate students. Participants of higher SES may not feel like a burden on those around them because educational needs (e.g., tuition, housing, school supplies) are not straining the family’s financial system.

The current study also adds to the literature examining the differences between thwarted belongingness and perceived burdensomeness. Although thwarted belongingness highlights dimensions such as social isolation, perceived burdensomeness highlights social disconnection (Van Orden et al., 2010). Perceived burdensomeness also examines the individual’s perception of liability and of self-hatred (Van Orden et al., 2010, Chu et al., 2017). Additionally, perceived burdensomeness has emerged as a foundational aspect of biobehavioral theories of suicidal behavior (Joiner, Hom, Hagan,
& Silva, 2016; Joiner & Stanley, 2016) and a greater predictor of suicidality than thwarted belongingness (Van Orden et al., 2018). The results of the current study indicate that negative urgency may be a contributor to perceived burdensomeness and subsequent suicidality. For all analyses, negative urgency was significantly associated with perceived burdensomeness; however, negative urgency did not significantly predict thwarted belongingness. Examination of Step 1(before the interaction term was entered) in the regression tables (tables 3-8) demonstrate a significant main effect between negative urgency and perceived burdensomeness, yet a nonsignificant main effect between negative urgency and thwarted belongingness. This indicates that negative urgency contributes to individuals’ liability and/or self-hatred.

One hypothesis as to why negative urgency relates to perceived burdensomeness is through specific maladaptive behaviors. Individuals who act impulsively when distressed may experience negative repercussions resulting from their actions (e.g., financial problems, legal problems, and interpersonal problems). The negative consequences could, in turn, result in strain on relationships of those around them leading to the mental calculation that others would be better off without them. This may be especially true for college-age students who may rely on their families for financial support.

Examination of normality of data indicated that self-reported aggression measures were positively skewed and leptokurtic, yet objective aggression was normally distributed. A hypothesis for this discrepancy could be that the implicit aggression measured an individual’s trait aggression while physical and relational aggression examined individual’s manifestations of that aggression. Additionally, the normal distribution of implicit associations could reflect a standard distribution of aggression.
These disparities in normality could provide preliminary results that indicate that the implicit association may be a more accurate measure of aggression.

Although results supported the null hypothesis, this study contributed to the growing literature in implicit associations. Previously, IATs have found significant interactions in clinical populations (Nock & Banaji, 2007) and in populations where aggressive behaviors have been identified (Gollwitzer, Banse, Eisenbach, & Naumann, 2007). These results suggest that an aggression IAT may not be suitable for well-adapted college students. As a result, the current IAT may be more useful in a setting where disciplinary issues have been identified.

Limitations

The results of this study should be interpreted alongside its limitations. First, participants were selected from a convenience sample of undergraduates. This sample was non-clinical in nature, with low scores in self-reported aggression. The average scores for the self-reported aggression scales were less than 1.5 out of a possible 7. Similarly, the mean IAT score was negative, indicating that the majority of participants view themselves as peaceful. Although the use of a convenience sample is a limitation, this study adds to the current literature involving college students. Another limitation is the sample size. Effect size analyses indicated a sample size of 107 participants would be needed for the analyses. Though data on 116 participants were collected, missing data led to analyses including 86, 88, or 90 cases. Further examination of the interaction’s $\Delta R^2$ scores for significant overall models indicate that the interaction accounted for, at most, 2% of the model’s variance. It is unlikely that additional cases would significantly increase the variance.
Strengths

Despite the aforementioned limitations, this study has multiple strengths. First, the sample is racially diverse. Participants were primarily (60.3%) African American, which is typically an underserved population in clinical research. Recent research on the lack of participation by African American individuals indicated that the most common barrier to participation is mistrust of research due to lack of information and historical mistreatment (Hughes, Varma, Pettigrew, Albert, 2017). Similarly, Williams and colleagues (2013) highlighted feelings of mistrust as a dominant reason why there is a lack of African American participation in psychological research. This study helps attenuate the gap in literature by adding ethically conducted research into the field. This study was also the first, to my knowledge, to examine how implicitly measured aggression is associated with suicidal desire. Furthermore, this study is one of the first, to my knowledge, to examine how implicit associations of aggression relates to relational and physical aggression.

Aggression IAT Future Directions and Conclusions

IATs have been known to work in settings in which the behavior has been previously observed (Gollwitzer, Banse, Eisenbach, & Naumann, 2007; Nock & Banaji, 2007) therefore, the aggression IAT created for this study may be better suited for a clinical setting in which aggression has been observed. Research has identified self-awareness as a factor that decreases aggressive responses in individuals who are heavy drinkers (Gallagher & Parrott, 2016; Purvis, Gallagher, & Parrot, 2016) and unemployed adults (Fischer, Greitemeyer, & Frey, 2008). Data and self-awareness of an individual’s scores of trait aggression association may be beneficial for treatment of individuals with known behavioral problems (e.g., intermittent explosive disorder traits, history of
physical altercations, history of verbal altercations, antisocial personality traits, or history of incarceration). Identifying individual’s trait aggression could identify aggressive cognitions and maladaptive thinking patterns that could highlight goals for treatment.

The current study added to the literature by providing further information on the connections between negative urgency, aggression, and suicidal desire variables. With non-significant interactions, the current study does not replicate McGirr and colleagues’ studies (2007; 2008); however, it could provide insight into the different aspects of aggression and impulsivity that would relate to suicide risk. Perhaps, reactive-inexpressive aggression (e.g., hostility; Yamasaki & Nishida, 2009) may be the key aggressive trait that would moderate the interaction.
APPENDIX A IRB Approval Letter

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Effect Report Form”.
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 17100504
PROJECT TITLE: Examining How Implicit and Explicit Aggression Moderates the Relationship Between Negative Urgency and Suicidal Desire
PROJECT TYPE: Master’s Thesis
RESEARCHER(S): Rachel Martin
COLLEGE/DIVISION: College of Education and Psychology
DEPARTMENT: Psychology
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 11/07/2017 to 11/06/2018
Lawrence A. Hosman, Ph.D.
Institutional Review Board
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