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The Relationship between Brooding, Cognitive Anxiety Sensitivity, Physical Anxiety Sensitivity, and Suicide Behaviors in Latino/a College Students

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THE RELATIONSHIP BETWEEN BROODING, COGNITIVE ANXIETY SENSITIVITY,
PHYSICAL ANXIETY SENSITIVITY, AND SUICIDE BEHAVIORS IN
LATINO/A COLLEGE STUDENTS

A Thesis

by

ERIC E. ESCAMILLA

Submitted to the Graduate College of
The University of Texas Rio Grande Valley
In partial fulfillment of the requirements for the degree of

MASTERS OF SCIENCE

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Major Subject: Clinical Psychology

THE RELATIONSHIP BETWEEN BROODING, COGNITIVE ANXIETY SENSITIVITY,
PHYSICAL ANXIETY SENSITIVITY, AND SUICIDE BEHAVIORS IN
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August 2018

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ABSTRACT

Escamilla, Eric E., The Relationship Between Brooding, Cognitive Anxiety Sensitivity, Physical Anxiety Sensitivity, and Suicide Behaviors in Latino/a College Students. Master of Arts (MA), August, 2018, 38 pp., 2 tables, 4 figures, references, 150 titles.

The current study explored if (1) brooding, cognitive anxiety sensitivity (AS), physical anxiety sensitivity (AS), and suicide behaviors will be strongly correlated; (2) brooding will mediate the relationship between cognitive AS and suicide behaviors; (3) brooding will mediate the relationship between physical AS and suicide behaviors; (4) physical AS will moderate the relationship between cognitive AS and suicide behaviors, (5) brooding will mediate the relationship between the physical AS and cognitive AS interaction with suicide behaviors in a Latino/a college student sample. All hypotheses were supported except for physical AS significantly moderating the relationship between cognitive AS and suicide behaviors. The findings of this study supports that the explored cognitive vulnerabilities are universal constructs and not specific to culture, race, or ethnicity. The interaction between cognitive AS and physical AS with suicide behaviors may not be as significant of a risk factor in a Latino/a college student sample.

DEDICATION

The completion of my thesis would not have been possible without the love, support, and knowledge of my family, friends, colleagues, bosses, professors, and mentors. I thank you for all your time, patience, and I would not have been able to accomplish this goal without you all.

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CHAPTER I

INTRODUCTION

Suicide and Latino/a College Students

Suicide is one of the public health problems of highest priorities worldwide, claiming approximately 800,000 lives every year and for every person that committed suicide there are approximately 20 or more who attempt suicide each year (World Health Organization, 2017). In the United States suicide was the tenth leading cause of death with a total of 44,193 committed suicides in 2015 (McIntosh & Drapeau, 2016) and among teens and young adults aged 15-34, suicide is the second leading cause of death (Centers for Disease Control and Prevention, 2015). Some of the highest rates of suicidal ideation and attempts are reported by young adults (Centers for Disease Control and Prevention, 2012) with suicide being the second leading cause of death within college students (National Institute of Mental Health, 2010). It was reported that 8.1% of college students attested to seriously considering suicide at some point in time within the last 12 months (American College Health Association, 2014).

Data on suicide ideation and attempts among the Latino/a population are inadequate considering that Latinos/as are the largest and fastest growing racial/ethnic minority group in the United States (U.S. Census Bureau, 2017). An important factor to consider and that is not completely understood is the relationship between ethnic factors and suicidal ideation and attempts. Past studies found that non-Hispanic whites had a significantly higher risk for suicide attempts than other ethnic groups (Moscicki, O'Carroll, et al, 1988) including Hispanics

(Sorenson & Golding, 1988). However, two nationwide surveys found inconsistent results that lacked any significant relationship between race/ethnicity and suicide ideation or attempts (Kessler, Berglund, et al., 2005; Kessler, Borges et al., 1999). In addition to these findings, two other studies on subgroups of Hispanics found that reported rates of suicide ideation and attempts were similar to or even higher than compared to reported rates of White populations (Fortuna, Perez, et al., 2007; Oquendo, Lizardi, et al., 2004).

Amid the findings supporting higher rates of suicidal behavior for Latinos/as compared to Whites, Gutierrez and colleagues (2001) found that Latino/a college students reported more past suicide behavior than their White peers, as well as a greater resentment toward life. Adding on to studies that found ethnic differences in suicidal behavior among college students, Latinos/as showed higher rates of reporting past suicidal behavior and current suicide plans, but lower rates of reporting current suicidal ideation compared to other ethnic groups (Del Pilar, 2009; Muehlenkamp, Gutierrez, et al., 2005). A study with an omnibus measure of attitudes towards suicide ideation, history of suicide ideation, and expectations for suicidal ideation and behavior resulted in higher scores for Latinos/as compared to Caucasian, Black, and Asian American college students (Muehlenkamp et al., 2005). It is important to focus on college students due to the emotional developmental changes that occur between the transitions from high school to college (Hicks & Heastie, 2008). Due to these troubling yet mixed findings, it is important for researchers to continue to identify students at risk for suicide, possible predictors for suicide, and to find effective ways to intervene with suicide in Latino/a populations.

Suicide

Suicide behavior consists of: thinking about suicide, the thought of death, a desire to no longer exist or be alive, discontinuing the use of medication for a mental disorder where suicidal

ideas is a symptom, prior hospitalization for suicide attempt, admitting prior suicide ideation, having a plan to commit suicide in the past, or having attempted suicide in the past (Goldston et al., 2008). There is a spectrum of suicidal behavior that consists of suicidal ideation, suicide attempts, and completed suicide (Hovey & King, 2002). Thoughts or wishes to be dead or kill oneself are suicidal ideation. Self-injurious behaviors with the purpose of suicidal intent are suicidal attempts. A self-inflicted injury with the result of an intentional death is a completed suicide. These three groupings are often envisioned as specific yet extending aspects of the spectrum of suicidal behavior (Brent, et al., 1988; King, 1997; Lewinsohn, Rohde, et al., 1996).

This study aims to add to the existing body of literature expressing the importance of detecting predictors and/or risk factors of suicide. Primarily, brooding, cognitive anxiety sensitivity, and physical anxiety sensitivity will be explored to identify their relationship and/or role in suicide behaviors.

CHAPTER II

REVIEW OF LITERATURE

Rumination, Anxiety Sensitivity, and Suicide

Cognitive models of suicide have classified a collection of responses to stressors that may lead to suicidal thoughts and behaviors (Ellis, 2006). Rumination is one response to stressors that has been regularly studied in its relationship with depression but is recently receiving consideration for its role in the onset of suicidal ideation and behavior (Morrison & O'Connor, 2008). Rumination is the cognitive mannerism to focus on one's feelings of distress, the causes of the distress, and the consequences of one's awareness of distress (Nolen-Hoeksema, 1991).

Rumination is characterized as a cognitive vulnerability that has been recognized in psychopathology literature (Morrison & O'Connor, 2008). Both depression (Cox, Funasaki, et al., 2012) and suicide ideation and behaviors (Morrison & O'Connor, 2008) have been found to have a relationship with rumination. The two established subtypes of rumination are brooding and reflection (Treynor, Gonzalez, et al., 2003). The components of each subtypes differ, but each involves the same cognitive process of self-focused attention. Brooding is focusing on negative, self-blaming, dreary, or anxious thoughts while reflection is to contemplate and attempt to deal with and overcome problems (Treynor et al., 2003).

Anxiety sensitivity is a cognitive vulnerability which is defined as a fear of anxiety and panic related sensations or a "fear of fear" and is comprised of three subfactors related to fears of the cognitive, physical, and social features of anxiety (Reiss, Peterson et al., 1986). Cognitive

anxiety sensitivity (AS) refers to having fear of losing control of cognitive ability such as believing that racing thoughts will lead to losing one's mind or going crazy. Physical anxiety sensitivity (AS) expresses a fear of physical tragedy such as an individual believing that an increase in heartbeat will lead to a heart attack. Social anxiety sensitivity (AS) expresses unfortunate social consequences related to anxiety such as worrying that an individual believes others are noticing their anxiety (Taylor et al., 2007; Zinbarg, Barlow et al., 1997). Anxiety sensitivity has been found to be affiliated with and as a predictor of the development of anxiety and mood pathology (Schmidt, Zvolensky et al., 2006).

The majority of research on anxiety sensitivity has primarily focused on the association between anxiety sensitivity and panic attacks and panic disorders (Schmidt, Lerew et al., 1997; Schmidt, et al., 2006). Past findings indicated that anxiety sensitivity was involved in the etiology and maintenance of panic disorder (McNally, 2002), social anxiety disorder, and posttraumatic stress disorder (Taylor, Koch et al., 1992). Anxiety has also been associated with suicidal ideation (Hill et al., 2011; Ruchkin, Schwab-Stone et al., 2003; Woods, Silverman et al., 1991), and recent research composed of a clinical outpatient sample has found anxiety sensitivity to be an important risk factor for suicide ideation (Capron, Cogle, et al., 2012; Capron, Fitch, et al., 2012).

Rumination and anxiety sensitivity have been shown to share similar factors and the processes of rumination and anxiety sensitivity have been found to have theoretical parallels (Cox, Enns, & Taylor, 2001; McLaughlin & Hatzenbuehler, 2009). Negative affect, negative emotion, and maladaptive symptoms are all responses to both rumination and anxiety sensitivity and have been conceptualized as types of distress tolerance or maladaptive emotion regulation strategies (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Weems, 2011).

Additionally, similarities between rumination and anxiety sensitivity are that both involve having cognitive biases in attention and interpretation (Epkins, Gardner, & Scanlon, 2013). For instance, anxiety sensitivity is conceptualized as an interpretation bias and is also viewed as a discriminatory attention bias due to individuals who experience high anxiety sensitivity particularly focus on their anxiety related sensation which results in a catastrophic interpretation leading to negative consequences (Elwood, Hahn et al., 2009; Weems & Watts, 2005). Additionally, focusing on negative affect is a result of rumination, and both attention and memory biases are a result of rumination as individuals who ruminate tend to focus and retrieve more negative information from past self-experienced memories than those who do not ruminate (Nolen-Hoeksema et al., 2008). Furthermore, negative interpretation biases regarding information, events, and the future are also results from individuals who ruminate (Nolen-Hoeksema et al., 2008). Hence, rumination and anxiety sensitivity both contain elevated attention to symptoms, distress, and the associated harmful meanings and/or consequences (Cox, Enns, & Taylor, 2001; McLaughlin & Hatzenbuehler, 2009), and theoretically, emotion regulation is affected by cognitive information-processing biases in depression and anxiety (Gotlib & Joormann, 2010).

Rumination and anxiety sensitivity were found to be both independently related to depressive and anxiety symptoms, where rumination has a specific relationship to depression and anxiety sensitivity has a specific relationship to anxiety (Epkins, Gardner, & Scanlon, 2013). However, when both rumination and anxiety sensitivity co-occur together, one or the other may serve as a mediator and/or moderator to a relationship with other maladaptive behaviors, symptoms, or disorders. Theoretical models have found rumination to play a mediating role on anxiety sensitivity by finding that anxiety sensitivity serves as a belief system, while rumination

serves as a cognitive process that operates on existing negative schemas (Cox et al., 2001). Cox and colleagues (2001) found that rumination as a whole fully accounted for the relationship between anxiety sensitivity and symptom severity in a sample of clinically depressed individuals. Additionally, Harwell, Cellucci, and Iwata (2011) found that rumination predicted the relationship between anxiety sensitivity and negative reinforcement drinking behaviors in a college student sample. Simon and colleagues (2007) also found that increased depressive ruminations mediates the relationship of anxiety and suicide ideation and behavior in a sample composed of clinical outpatients diagnosed with bipolar disorder.

Brooding and Suicide

Brooding has consistently been found to be associated with high rates of depressive symptoms within the literature (Burwell & Shirk, 2007; Treynor et al., 2003). Brooding has also been found to be simultaneously or potentially associated with negative affect in a Caucasian adult sample (Moberly & Watkins, 2008), suicide ideation and attempts in an ethnically diverse college student and community sample (Chan, Miranda, & Surrence, 2009; Miranda & Nolen-Hoeksema, 2007; O'connor & Noyce, 2008), and passive coping in an ethnically diverse college student sample (Marroquin, Fontes, Scilletta, & Miranda, 2010). A study of a college student and community sample in the United Kingdom found that brooding was perceived to be an ineffective coping strategy and was strongly associated to depressed mood (Gooding, Taylor, & Tarrier, 2012). A study conducted on psychiatric inpatients found that brooding was more likely to occur in patients with a past suicide attempt than patients without a past suicide attempt. (Grassia & Gibb, 2009).

When addressing how brooding plays a role in high levels of suicide ideation, it is important to consider the possible mediators and moderators that are involved. It was found in a

White community sample that symptoms of depression accounted for the relationship between brooding and suicide ideation (Miranda, & Nolen-Hoeksema, 2007). Furthermore, a study conducted on an ethnically diverse sample of college students found that brooding partially accounted for the relationship between negative life events and suicidal ideation (Chan, Miranda, & Surrence, 2009). Brooding also fully predicted the relationship between cognitive inflexibility and suicidal ideation in an ethnically diverse young adult sample (Miranda, Valderrama, Tsypes, Gadol, & Gallagher, 2013).

The literature shows that brooding also plays a moderating role with suicidal ideation. It was found in a predominately White college student sample that brooding had an interacting effect on the relationship between perceived stress and increased levels of suicidal ideation (Cole, Wingate et al., 2015). Another study on depressed adolescent inpatients from Iran found that emotional intelligence partially explained the relationship between brooding with suicidal ideation, while suicidal history caused the interaction between brooding, and emotional intelligence, with suicidal ideation (Abdollahi & Talib, 2015). Additionally, low levels of hope and optimism were both found to have an interacting effect on the relationship between brooding and increased levels of suicidal ideation in a predominately White college student sample (Tucker et al., 2013).

Cognitive Anxiety Sensitivity, Physical Anxiety Sensitivity, and Suicide

Examination of anxiety sensitivity as a unidimensional construct may blur multi-faceted associations between anxiety sensitivity and suicidality (Capron et al., 2012). Recent meta-analysis and research conducted on clinical, community, and college student samples has contributed evidence that subfactors of anxiety sensitivity are differentially associated with particular anxiety disorders and depression (Naragon-Gainey, 2010; Wheaton, Deacon et al.,

2012). Cognitive AS has been associated with generalized anxiety disorder (Olatunji & Wolkitzky-Taylor, 2009), depression (Deacon, Abramowitz et al., 2003; Rector, 2007), mood disorders (Naragon-Gainey, 2010; Tull & Gratz, 2008), as well as post traumatic stress disorder (Lang, Kennedy et al., 2002; Vujanovic, Zvolensky et al., 2008). Physical AS has been associated with panic disorder (Olatunji & Wolkitzky-Taylor, 2009), agoraphobia (Zinbarg, Brown et al., 2001), and post-traumatic stress disorder (Asmundson & Stapleton, 2008). Additionally, physical AS has been found to be more strongly linked with anxiety psychopathology compared to cognitive AS (Olatunji & Wolkitzky-Taylor, 2009). This may be due to physical AS having more of an abnormal interpretation of physical or external stimuli responses compared to the cognitive AS being more of an abnormal interpretation of thinking, feelings, and emotional responses.

In regards to cognitive AS and physical AS relationship with suicidality, cognitive AS has shown to have the most consistent findings in a relationship with suicide ideation. Cognitive AS was associated with elevated suicidal ideation in patients with panic disorder (Schmidt, Woolaway-Bickel et al., 2001), clinical outpatients (Capron, Fitch, et al., 2012), air force cadets (Capron, Cogle, et al., 2012), cigarette smokers (Capron, Blumenthal, et al., 2012), and individuals with HIV (Capron, Gonzalez, et al., 2012). However, in a clinical sample it was found that cognitive AS was not significantly associated with suicide ideation after controlling for depression (Allan, Norr et al., 2015), suggesting that the relationship may be accounted for by depression.

Capron and colleagues (2012) also found in an outpatient sample with individuals screened as having PTSD and military cadets that physical AS appears to moderate the relationship of cognitive AS and suicide attempt history and suicide ideation, meaning that

individuals with high levels of cognitive AS concerns and low levels of physical AS concerns had a higher risk for suicide behaviors. This may indicate that physical AS may serve as a protective factor for suicidality (Allan et al., 2015).

The role of physical AS serving as a protective factor for suicidality may support the Interpersonal-Psychological Theory of Suicide. The Interpersonal-Psychological Theory of Suicide (Joiner, 2005; Van Orden et al., 2010) declares that a person will not die by suicide with the exception that he or she has both the desire and attained capability to do so. A desire to die emerges from two distinct psychological states: perceived burdensomeness (belief that I am a burden to others) and thwarted belongingness (belief that I am alone). The second part of the theory, the acquired capability for suicide, includes having no fear of death and an enduring ability for self-inflicted pain learned through experiencing painful or disturbing events regularly (e.g., past suicide attempts, self-injurious behaviors, numerous physical fights, etc.). In the context of the interpersonal psychological theory, Capron and colleagues (2012) suggests individuals with high physical AS concerns may be unlikely to engage in the types of regularly painful or disturbing incidents necessary to promote the attained capability to execute a suicide. In contrast, individuals that endorse low physical AS concerns may be more likely to engage in behaviors that promote self-harm. This suggests that individuals with both low physical AS concerns and high cognitive AS concerns may be more capable of suicide behaviors. It is important to continue examining cognitive vulnerability factors that are associated with anxiety, depression, and suicide so that implementations of effective treatments can help reduce suicidality.

To our knowledge no study has explored if brooding mediates the relationship between cognitive AS and physical AS with suicide behaviors, and if cognitive AS and physical AS

jointly play a moderating role in the relationship with suicide behaviors, while brooding continues to play a mediating role in a Latino/a college student sample. Furthermore, this study aims to add to literature which states the importance of understanding the associations among cognitive vulnerabilities, the theoretical implications involved, and the implications for cognitive-behavioral treatments of depression (Stark, Steusand et al.,2012), anxiety (Kendall, 2012), and reduction in suicidality.

CHAPTER III

METHODOLOGY AND FINDINGS

Purposes and Hypotheses of Present Study

The purpose of the current study is to gain a better understanding of the relationships among brooding, cognitive AS, physical AS, and suicide behaviors in a Latino/a college student sample. We hypothesize that (1) brooding, cognitive AS, physical AS, and suicide behaviors will be strongly correlated; (2) brooding will mediate the relationship between cognitive AS and suicide behaviors; (3) brooding will mediate the relationship between physical AS and suicide behaviors; (4) physical AS will moderate the relationship between cognitive AS and suicide behaviors, such that those with high levels of cognitive AS and low levels of physical AS will endorse higher levels of suicide behaviors; (5) brooding will mediate the relationship between the physical AS and cognitive AS interaction and suicide behaviors.

Method

Participants

Participants consisted of 486 Latino/a undergraduate students 18 years of age and older (M age = 20.44 years, SD age = 3.24; 68 % females; 99 % Mexican/Mexican American).

Participants were recruited from psychology courses from The University of Texas Rio Grande Valley located in South Texas United States. They were recruited from an undergraduate research subject pool and from various undergraduate psychology courses.

Procedure

The present study received approval from The University of Texas Rio Grande Valley Institutional Review Board (IRB). The current study was listed in the SONA system hosted by the University of Texas Rio Grande Valley's department of psychological science online sign-up system. The current study is cross-sectional; i.e., it collected data from each participant at one-time point.

Measures

Demographic Form. A demographics form assessed age, gender, ethnicity, marital status, religious affiliation, age at migration, education, family income, occupation, place of birth, preferred language spoken, parents preferred language spoken, and family intactness.

Ruminative Response Scale (RRS). Rumination subtype brooding was measured using the Ruminative Responses Scale (RRS) (Nolen-Hoeksema, & Morrow, 1991) of the Response Styles Questionnaire. The RRS consist of 22 items assessing responses to depressed mood that are focused on the meaning, potential causes, and consequences of the negative mood. Five items measured brooding. The brooding subscale assesses the tendency to focus on one's depressed mood and the consequences of this mood. Example item for brooding include, "How often do you think why do I always react this way." Responses are rated to the degree to which they engage in each response when in a sad or depressed mood on a 4-point Likert scale (1 = never or almost never to 4 = almost always). The range of scores were 0 to 20 with higher scores reflecting greater levels of brooding. The brooding subscale displayed good internal consistency ($\alpha = .84$).

Anxiety Sensitivity Index – Revised (ASI-R). Cognitive AS and physical AS were measured using the Anxiety Sensitivity Index–Revised (ASI-R). The ASI-R (Taylor & Cox, 1998) is a revised version of the ASI. The ASI-R consists of 36 items that assess anxiety-related

sensations based on the beliefs about their harmful consequences. Six items measured cognitive AS, and nineteen items measured physical AS. Example item for cognitive AS include “ When I cannot keep my mind on task, it scares me that I may be going crazy,” example item for physical AS include “It scares me when I feel short of breath,”. Each item is rated on a 5-point Likert scale (0 = very little to 4 = very much) with higher scores reflecting greater levels of anxiety sensitivity. The cognitive AS subscale displayed excellent internal consistency ($\alpha = .91$) and the physical AS subscale displayed excellent internal consistency ($\alpha = .95$).

Suicide Behaviors Questionnaire-Revised (SBQ-R). Severity of suicidal risk was measured using the Suicidal Behavior Questionnaire-Revised. The SBQ-R is a four-item self-report questionnaire targeting lifetime prevalence of suicidal thoughts, suicidal behaviors, current suicidal ideation, and suicidal risk (Osman, Bagge et al., 2001). The SBQ-R demonstrated good internal consistency in the current study ($\alpha = .80$). 16 % of the sample scores surpassed the cutoff score of > 6 .

Analytic Plan

Quantitative data analyses were performed with the anonymous data to investigate the above mentioned research hypotheses. A basic descriptive analysis was conducted for all the variables. Pearson product moment r correlations were conducted to assess the strength of bivariate relationships among variables. A Preacher and Hayes bootstrap method for mediation analysis was conducted to assess if brooding mediates the relationship between cognitive AS and suicide behaviors, and to assess if brooding mediates the relationship between physical AS and suicide behaviors. A hierarchical regression analysis was conducted to assess if physical AS moderates the relationship between cognitive AS and suicide behaviors. Additionally, another Preacher and Hayes bootstrap method for mediation analysis was conducted to assess if brooding mediates the interaction of cognitive AS and physical AS with suicide behaviors.

The Preacher and Hayes bootstrapping method will provide point estimates and confidence intervals by which one can assess the significance or non-significance of a mediation effect. Point estimates reveal the mean over the number of bootstrapped samples and if zero does not fall between the resulting confidence intervals of the bootstrapping method, one can confidently conclude that there is a significant mediation effect to report.

Results

Descriptives and Correlations

Table 1 shows the means and standard deviations for brooding, cognitive AS, physical AS, depression, hopelessness, and suicide behaviors. These values were within expected limits. Table 1 also shows the intercorrelations among variables. As expected, all variables were moderately to strongly positively correlated with each other.

TABLE 1. Intercorrelations and Means and Standard Deviations of Brooding, Cognitive AS, Physical AS, and Suicide Behaviors.

	Brooding	Cognitive AS	Physical AS	Suicide Behaviors	M	SD	N
Brooding	--	.55*	.49*	.44*	6.1	4.2	486
Cognitive AS	.55*	--	.72*	.34*	5.8	6.4	480
Physical AS	.49*	.72*	--	.26*	19.5	17.5	469
Suicide Behaviors	.44*	.34*	.26*	--	4.7	2.4	476

Note: * $p < .01$.

Mediating Influence of Brooding in relation between Cognitive AS and Suicide Behaviors.

Mediation analyses were tested using the bootstrapping method with bias-corrected confidence estimates (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2004). In the present study, the 95% confidence interval of the indirect effects was obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008). Results of the mediation analysis confirmed the

mediating role of brooding in the relation between cognitive AS and suicide behaviors (unstandardized coefficient = .08; CI = .05 to .10). Figure 1 displays the results.

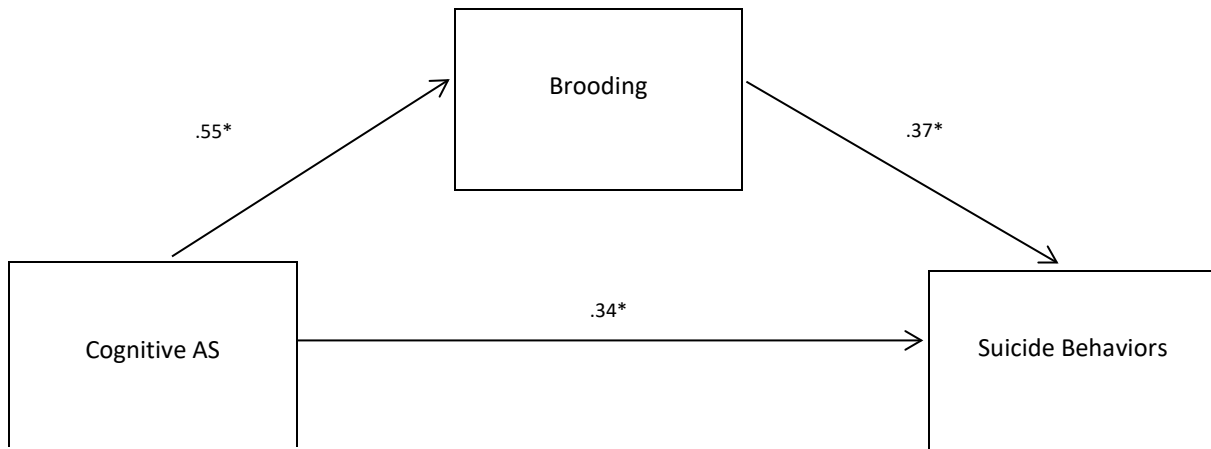


Figure 1. Brooding as a mediator between cognitive AS and suicide behaviors. Note. The above values are standardized beta coefficients. * $p < .001$. Cognitive AS had a significant indirect effect on Suicide Behaviors through Brooding (unstandardized coefficient = .08, CI = .05 to .10)

Mediating Influence of Brooding in relation between Physical AS and Suicide Behaviors.

Mediation analyses were tested using the bootstrapping method with bias-corrected confidence estimates (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2004). In the present study, the 95% confidence interval of the indirect effects was obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008). Results of the mediation analysis confirmed the mediating role of brooding in the relation between physical AS and suicide behaviors (unstandardized coefficient = .03; CI = .02 to .04). Figure 2 displays the results.

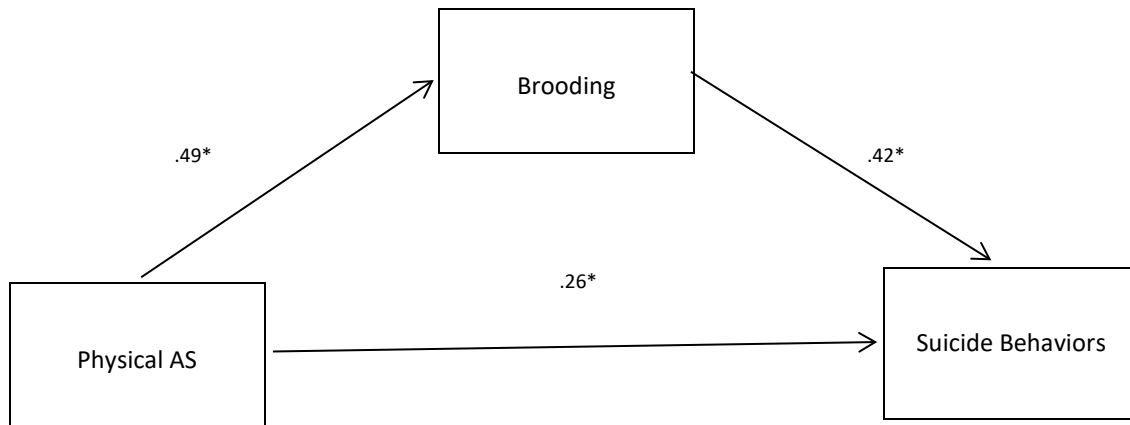


Figure 2. Brooding as a mediator between physical AS and suicide behaviors. Note. The above values are standardized beta coefficients. * $p < .001$. Physical AS had a significant indirect effect on Suicide Behaviors through Brooding (unstandardized coefficient = .03, CI = .02 to .04)

Moderating Influence of Physical AS in relation between Cognitive AS and Suicide Behaviors.

To test whether physical AS moderates the relationship between cognitive AS and suicide behaviors, a hierarchical multiple regression analysis was conducted. In the first step, two variables were included: cognitive AS and physical AS. These variables accounted for a significant amount of variance in suicide behaviors, $R^2 = .12$, $F(2, 457) = 30.64$, $p < .001$. An interaction term between cognitive AS and physical AS was created. Next, the interaction term between cognitive AS and physical AS was added to the regression model, which accounted for a significant proportion of the variance in suicide behaviors, $R^2 = .13$, $F(1, 456) = 22.57$, $p = .02$, $\beta = -.28$, $t(459) = -2.40$, $p = .02$. Examination of the interaction plot showed an effect that individuals with high levels of cognitive AS and low levels of physical AS have higher levels of suicide behaviors compared to individuals with high levels of cognitive AS and high levels of physical AS. Table 2 and Figure 3 display the results.

Table 2. Hierarchical Multiple Regression Analyses Testing the Moderation of the Effect of Cognitive AS on Suicide Behaviors by Physical AS

Dependent and predictor variables	β	t	p
Suicide Behaviors			
Step 1			
Cognitive AS	.33	5.20	.001
Physical AS	.02	.33	.74
Step 2			
Cognitive AS	.49	5.30	.001
Physical AS	.14	1.74	.08
Cog AS X Phy AS	-.28	-2.40	.02

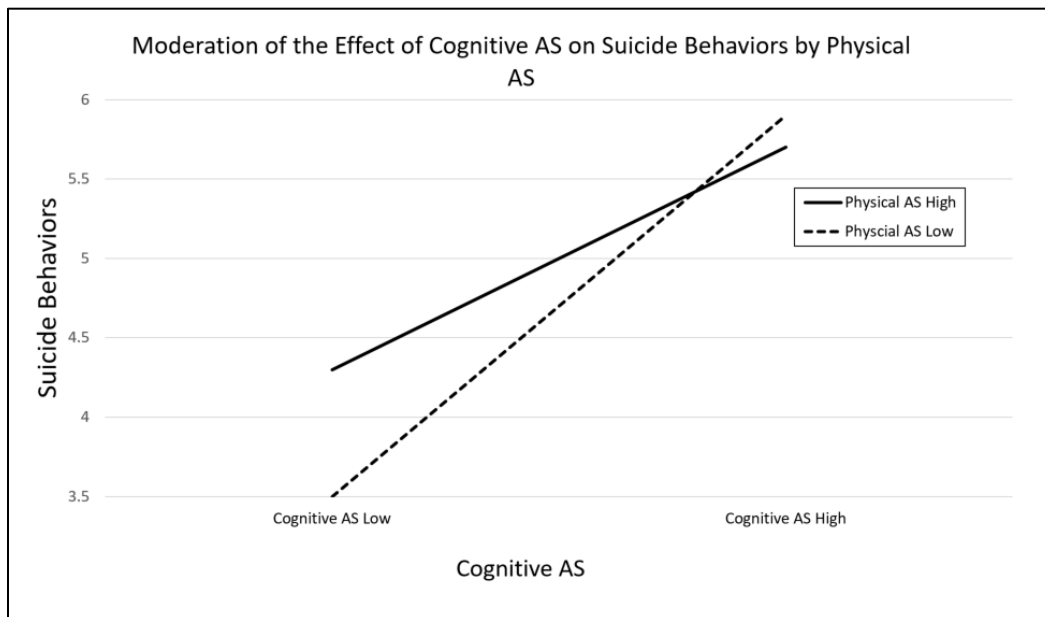
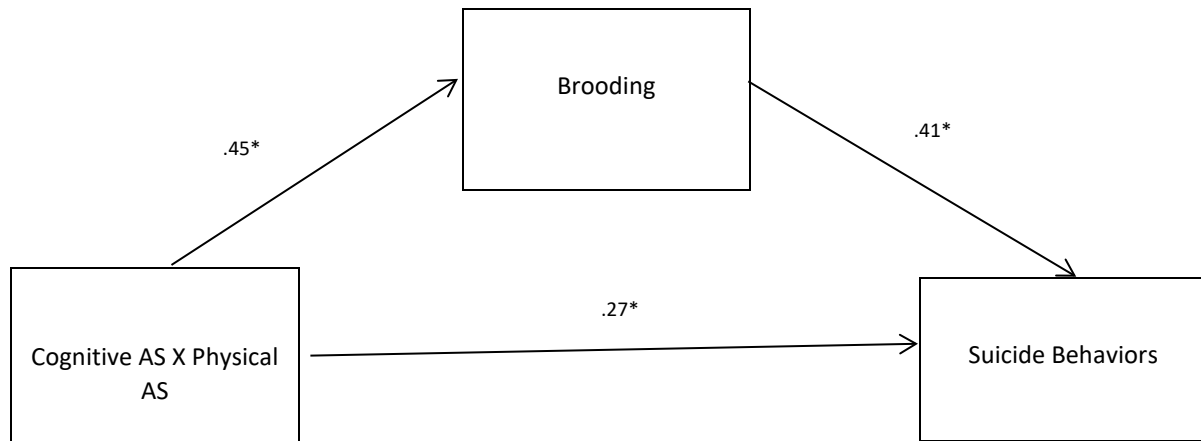


Figure 3. Effect of cognitive AS on Suicide Behaviors by physical AS.

Mediating Influence of Brooding in relation between Cognitive AS X Physical AS Interaction and Suicide Behaviors.

Mediation analyses were tested using the bootstrapping method with bias-corrected confidence estimates (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2004). In the present study, the 95% confidence interval of the indirect effects was obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008). Results of the mediation analysis confirmed the mediating role of brooding in the relation between cognitive AS X physical AS interaction and

suicide behaviors (unstandardized coefficient = .001; CI = .001 to .002). Figure 4 displays the results.



*Figure 4. Brooding as a mediator between cognitive AS X physical AS interaction and suicide behaviors. Note. The above values are standardized beta coefficients. * $p < .001$. Cognitive AS X Physical AS interaction had a significant indirect effect on Suicide Behaviors through Brooding (unstandardized coefficient = .001, CI = .001 to .002)*

CHAPTER IV

SUMMARY AND CONCLUSION

Discussion

The association among cognitive vulnerabilities and how it may result in increased suicidal behaviors is not fully understood. The present study aimed to add to the limited literature on cognitive vulnerabilities, specifically brooding, cognitive AS, and physical AS, and how they play a role with suicide behaviors in a Latino/a college student sample. Results were consistent with prior findings showing that brooding (Chan, Miranda et al., 2009; Miranda & Nolen-Hoeksema, 2007; O'connor & Noyce, 2008), cognitive AS, and physical AS have a positive relationship with suicide behaviors, but with cognitive AS having a stronger relationship than physical AS (Capron, Blumenthal, et al., 2012; Capron, Cogle, et al., 2012; Capron, Fitch, et al., 2012; Capron, Gonzalez, et al., 2012; Schmidt et al., 2001), and with brooding having a stronger relationship than both cognitive and physical AS (Simon et al., 2007).

The relationships among each variable may be explained by prior research suggesting that brooding, cognitive AS, and physical AS each involve having cognitive biases in attention and interpretation (Epkins et al., 2013). For example, individuals who have experienced stressful events may be more likely to brood (Robinson & Alloy, 2008; Watkins, 2008), and these stressful events may eventually lead to an increased attention to cognitive or physical related anxiety symptoms. The pairing of the increased attention to anxiety symptoms with brooding

may lead to a negative belief system that focuses on the consequences of the anxiety symptoms, such as anxiety sensitivity. If each of the explored cognitive vulnerabilities focus on the meaning or consequences of negative affect, negative emotion, and distress (Nolen-Hoeksema, Wisco et al., 2008), each of the cognitive vulnerabilities can be conceptualized as types of distress tolerance or maladaptive emotion regulation strategies (Aldao, Nolen-Hoeksema et al., , 2010; Weems, 2011) which can increase suicide behaviors.

The current study found that brooding mediated both the relationships between cognitive AS and suicide behaviors and physical AS and suicide behaviors. Our data suggests that there is an important link between the relationship of cognitive AS, physical AS, and brooding with suicide behaviors. Simon and colleagues (2007) found that greater anxiety distress is significantly positively related with greater rumination, and with rumination being a stronger predictor than anxiety symptoms to lead to increased levels of suicidal behaviors. The current study expanded on Simon and colleagues (2007) prediction that rumination, specifically brooding did mediate the relationship with both cognitive and physical AS and suicide behaviors in a Latino/a college student sample.

In a cultural context this supports that the relationships among brooding, cognitive AS, and physical AS may be universal constructs and not specific to culture, race, or ethnicity, but rather to the individuals personality, emotional intelligence, coping style, cognitive process, belief system, etc. Cox and colleagues (2001) suggested that rumination (brooding, reflection) is a cognitive process that operates on existing negative schemas while anxiety sensitivity (cognitive, physical, social) serves as a belief system that may be stable over time unless treated (Maller & Reiss, 1992). It may be that individuals, regardless of culture, race, or ethnicity, who

express high anxiety sensitivity concerns ruminate on past negative anxiety related experiences, leading to an increase of suicide behaviors.

The findings of this study found that individuals who have endorsed a combination of low physical AS concerns and high cognitive AS concerns exhibit an increase in suicide behaviors. However, examination of the interaction plot showed that individuals with low levels of physical AS and high cognitive AS may be just as likely to endorse suicidal behaviors as individuals with both high physical AS and high cognitive AS. The current studies findings fail to replicate Capron and colleagues (2012, 2013) findings among a sample of clinical outpatients with PTSD and a community sample from Russia which suggests that this complex interaction may account for the association between anxiety sensitivity and suicide behaviors. High levels of cognitive AS reflect fears of loss of control over mental competence which may lead to an increase of suicide behaviors (Katz et al., 2011). Capron and colleagues (2012, 2013) suggests that this combination of the fear of loss of mental control (cognitive AS) and a fearlessness of painful and disturbing experiences, which low levels of physical AS concerns may portray, may elevate risks for suicide behaviors. Brown and colleagues (2002) suggests that emotional dysregulation and higher pain tolerance is linked to suicide attempt and the Interpersonal-Psychological Theory of Suicide (Joiner, 2005; Van Orden et al., 2010) declares that a person will not die by suicide with the exception that he or she has both the desire and attained capability to do so. The current study did result in a significant moderation, however the interaction plots show that this combination of low physical AS with high cognitive AS compared to high physical AS and high cognitive AS does not have as much impact on suicide behavior as Capron and colleagues (2012, 2013) suggests. The discrepancies between each combination of physical AS and cognitive AS appear to be most apparent at the low physical AS

and high physical AS with low cognitive AS. This suggests that individuals with both low levels of physical and cognitive AS are at minimal risk for suicide behaviors compared to individuals with high physical AS and low cognitive AS, high physical AS and high cognitive AS, and low physical AS and high cognitive AS. Additionally, brooding mediated this interaction further supporting that brooding may initiate suicide behaviors when cognitive and physical AS concerns are involved.

Implications

Brief interventions of anxiety sensitivity concerns have not only shown to reduce psychopathology, but a reduction in suicide behaviors as well (Keough & Schmidt, 2012; Schmidt et al., 2017). Future development of interventions that focus on each subtype of anxiety sensitivity (cognitive, physical) may have a greater impact on reducing suicide behaviors. Additionally, individuals who experience cognitive AS concerns and physical AS concerns may be at risk of brooding. Brooding may then be a strong influential factor to increase suicide behaviors because brooding may reduce cognitive resources to the extent that cognitive AS concerns and physical AS concerns may be viewed as unchangeable. Thus, if a client continues to engage in brooding in response to cognitive AS and physical AS, it can help to assess the level of suicide risk. Cognitive and behavioral therapies that address brooding and anxiety such as mindfulness, behavioral activation, or a rumination focused cognitive behavioral therapy may be helpful in preventing or reducing suicide behaviors.

Limitations

There are several limitations to the current study. One limitation is the use of a convenience sample of college students, which compared to a clinical or community sample may have lower base rates of suicide behaviors. Additionally each variable was examined using a

self-report measure that may increase the likelihood of method bias influencing the results. The current study was also a cross-sectional study, and a longitudinal study may better help determine if any specific causality or temporal precedence factors increase suicide behaviors.

Directions for Future Research

Future research should attempt to replicate the current findings in a Latino/a clinical sample to verify the capable clinical utility of understanding each variables role with suicide behaviors. Also comparing these findings to a local non-Latino/a sample may help determine if there are any differences in results when comparing different ethnicities. Adding a longitudinal treatment study with brief interventions that demonstrate a decrease in cognitive AS, physical AS, and brooding to determine if it reduces suicide behaviors in a clinical sample may also be beneficial to clinicians. Additional measures of suicide such as self-monitoring, peer-monitoring, status, implicit, or subjective scales should be included. The current study only used a suicide behaviors questionnaire, and adding on a subjective, ideation, implicit, or specific items addressing previous suicide attempt may help determine of each subfactor of anxiety sensitivity or subtype of rumination increases the likelihood of suicide ideation, behaviors, or attempts.

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BIOGRAPHICAL SKETCH

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