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Autobiographical Memory Perspectives in Suicide Attempt and Task Recall: A Study of Young Adults with and without Symptoms of Suicidality

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AUTOBIOGRAPHICAL MEMORY PERSPECTIVES
IN SUICIDE ATTEMPT AND TASK RECALL:
A STUDY OF YOUNG ADULTS WITH
AND WITHOUT SYMPTOMS OF SUICIDALITY

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ABSTRACT

Memories recalled from the field, or first person, perspective tend to be specific, more detail-oriented, and emotional, while memories from the observer, or third person, perspective, tend to be general, less detail-oriented, and less emotional. Research suggests that individuals with a history of suicidality exhibit over-general autobiographical memories (i.e., lacking in detail; Pollock & Williams, 2001). Over-general memory may be related to a bias towards the observer perspective during memory encoding and recall. This study tested this hypothesis by examining the autobiographical recall perspectives of 107 young adults with and without symptoms of suicidality during task and negative event recall. Compared to controls, those with a history of suicide attempts recalled tasks and the neutral event significantly less from the observer perspective and significantly more from the field perspective; suicide ideators and controls were not significantly different on recall perspectives. No significant differences in negative event recall were found across groups. Results indicated that individuals with a history of suicide attempts exhibited a recall bias towards first person, internally focused memories. Limitations and future directions are discussed.
INTRODUCTION

Thoughts about suicide, or suicidal ideation, represent one of the strongest predictors of future suicide attempts and completed suicide (Nock et al., 2008). Thus, the goal of this study is to better understand the cognitive processes associated with suicidal ideation and behavior (suicidality). Recent research suggests that individuals with a history of suicidality tend to report over-general (i.e., nonspecific, lacking in detail, vague) autobiographical memories and this tendency is associated with negative outcomes (e.g., deficits in interpersonal problem solving, hopelessness about the future; Pollock & Williams, 2001; Williams et al., 2006). Importantly, over extended periods of time, an over-general memory system may lead to increased risk for suicidality (Arie et al., 2008). However, little is known about the mechanisms contributing to reduced recall specificity among those with a history of suicidality.

One hypothesis is that reduced recall specificity is related to a biased perspective during memory encoding and recall. Specifically, individuals with a history of suicidality may encode and recall memories more from the observer, or third person, perspective, a perspective that is associated with recalling fewer details about events. To the author’s knowledge, no previous research has examined autobiographical recall perspectives in the context of suicidality. To test this hypothesis, this study investigated the autobiographical (i.e., episodic and personal) recall perspectives (Nigro & Neisser, 1983) of individuals with a lifetime history of suicidal ideation and attempts and those without such history.

Imagine, for a moment, the last time you gave a public talk: let the experience and associated emotions come back to you. Do you see the audience at your talk sitting in front of you through your own eyes? This is an internal, first person, field perspective on past events whereby memories are recalled through one’s own eyes (Nigro & Neisser, 1983). Alternatively, perhaps you view yourself in the scene, and you see your past self presenting the talk. This external, third person, observer perspective in memory takes the position of a passive spectator (Nigro & Neisser, 1983). In general, autobiographical memories may be retrieved from these two, non-mutually-exclusive perspectives, which may be assumed simultaneously in some instances. Events of the distant past (as soon as two days after the event; Eich, in preparation)
tend to be viewed more from the observer perspective, and more recent events from the field perspective (Frank & Gilovich, 1989; Nigro & Neisser, 1983; Rice & Rubin, 2009).

The retrieval perspective influences the properties of the memory that is recalled (Eich et al., 2011; Rice & Rubin, 2009). Memories recalled primarily from the observer perspective tend to be general, less detail-oriented, and less emotional (c.f. emotional distancing; Libby & Eibach, 2002; Robinson & Swanson, 1993). Neuroimaging data suggest that recall from a perspective outside the body is tantamount to a neural disengagement, or a shutting down of neural circuitry that is responsible for monitoring internal bodily states (Eich et al., 2009). As such, a bias towards the observer perspective, which is analogous to viewing a personal event from the position of a detached spectator, may decrease the salience of the event details and the amount of emotion associated with a memory. In contrast, field memories tend to be specific, more detail-oriented, and emotional (McIsaac & Eich, 2002; Rice & Rubin, 2009). Given that observer memories tend to be less detailed, an observer perspective bias may contribute to the nonspecific quality of memory recall among individuals with a history of suicidality.

As the observer perspective is associated with viewing personal memories from the standpoint of a distant outsider, one consequence of the tendency to recall memories from the observer perspective may be a reduced feeling of belongingness. Feelings of thwarted belongingness, a construct of the interpersonal theory of suicide associated with increased desire for suicide, is the perception that one is an outsider in a social group and that one is disconnected and alienated from others (see Joiner, 2005 and Van Orden et al., 2010 for details). A tendency to recall memories from an observer perspective may reduce emotional salience of previous interpersonal interactions, decrease feelings of connectivity with others, and exacerbate symptoms of thwarted belongingness. As thwarted belongingness is a risk factor for suicidal ideation and attempts (Van Orden et al., 2012), the potential relationship between thwarted belongingness and the observer perspective may suggest an association between recall perspective and suicidality.

To the author’s knowledge, no research, thus far, has examined whether individuals with a history of suicidality may demonstrate biases in recall perspective. This study adopted three approaches to investigating the hypothesis that individuals with a history of suicide attempts
exhibit an observer recall perspective bias. First, in order to minimize confounds associated with variations in memory content across participants (Robinson & Swanson, 1993), this study compared the perspective adopted by individuals with a history of suicide attempts and current suicidal ideation, those with current suicidal ideation, and those without any symptoms of suicidality during the recall of tasks completed by all participants. Second, to determine whether the age of the event affects the recall perspective, task recall perspectives were examined three days after completing the tasks. Third, in order to examine the recall of past personal events of individuals with and without symptoms of suicidality, the recall perspectives of a past negative (i.e., previous suicide attempt or most traumatic event) and neutral event were compared.
METHODS

Participants

Participants were 107 young adults (34.8% male) recruited from the general undergraduate psychology subject pool at Florida State University (FSU). Ages ranged from 18 to 35 ($M = 19.3$ years, $SD = 2.5$). Participants were 74.8% Caucasian, 7% Black, 5.2% Asian, 0.9% American Indian/Alaskan Native, and 4.3% identified as Other; 7.8% did not report their race. Participants were primarily non-Hispanic (71.3%). Most participants reported no mental health diagnoses (90.5%) and the remainder acknowledged a history of a Mood Disorder (4.3%), Anxiety Disorder (2.9%), and Posttraumatic Stress Disorder (1.9%); 1.7% reported a comorbid Eating Disorder. Participants varied as a function of their symptoms of suicidality: 71.0% have never attempted or thought about suicide ($n = 76$), 13.1% have thoughts about suicide without a previous attempt ($n = 14$), and 15.9% have at least one previous suicide attempt ($n = 17$, maximum $= 5$ attempts). Among the 17 individuals with a history of suicide attempts, 10 had a history of one previous suicide attempt and 7 had a history of multiple suicide attempts. Negative events reported among controls during the event recall portion of the study were categorized based on a measure of stressful life events (Goodman, Corcoran, Turner, Yuan, & Green, 1998). Among control participants, most reported that the most negative and emotional event they have experienced is the death of a loved one (45.2%), 10.4% reported a life-threatening illness, injury or accident involving self, 10.4% reported a life-threatening illness, injury or accident involving a loved one, 8.6% reported physical or sexual assault or abuse, 5.2% reported parental divorce, 3.4% reported witnessing a death or assault, 1.8% reported robbery or mugging, 1.8% reported other horrifying event; 13.2% did not wish to disclose the nature of the event.

For the purposes of this study, individuals presenting with cognitive impairments or language barriers that would preclude the provision of informed consent were excluded. The novelty of performing manual tasks in this study is important for subsequent recall; thus, participants who have previously participated in a similar task recall study were excluded. Procedures were in accordance with guidelines set forth by the FSU Institutional Review Board.
Procedures

Recruitment and Participant Screening. All participants completed an online screening questionnaire that was available to all undergraduate students. The screening questionnaire included two items assessing their symptoms of suicidality. The first item assessed the number of previous suicide attempts, and the second assessed for suicidal ideation and the formation of plans for suicide. Although all individuals, regardless of their symptoms of suicidality were invited to participate, individuals whose responses to the screening questionnaire suggest a history of suicide attempts or suicidal ideation were prompted to participate by e-mail.

All individuals were screened for the presence of factors that preclude their participation. Following informed consent, all individuals meeting eligibility requirements completed a brief questionnaire that assessed various demographic variables (e.g., age, gender, ethnicity). The procedure for this study was divided into three parts: immediate task recall, immediate event (i.e., suicide attempt or negative event, and neutral) recall, and delayed task recall. Immediate recall occurred in the lab, and delayed task recall occurred three days after completing the tasks in the lab. The order of immediate task and event recall completion was randomized to avoid potential order effects. Participants were compensated with two research credits.

Immediate Task Recall. Similar to McIsaac and Eich’s study (2002), each participant performed 12 tasks, which were all intended to be similarly engaging, simple, manual and relatively unfamiliar. For instance, participants were asked dress a stuffed animal (i.e., tie and tie around its neck) and to arrange playing cards in piles adding up to 21. Materials for the 12 tasks were as follows: dice, a mini basketball and hoop, a tie and teddy bear, 20-piece puzzle, a chess set, scrap paper, photocopies of a newspaper article, crayons, Lego pieces, a small box of items of varying sizes, a deck of cards and a hat. Participants were given one minute and 30 seconds to complete each task and the order in which the tasks were performed was randomized. After completing the tasks, participants engaged in a mentally stimulating filler task (i.e., a Sudoku puzzle) for five minutes.

Approximately 10 minutes after completing the tasks, participants were asked to recall (one at a time) 6 of the 12 tasks they just performed and rate their memory on five scales. A scripted phrase prompts participants to recall the tasks that they performed (e.g., “Do you remember when I asked you to complete a puzzle?”). In anticipation of potential order effects,
participants were randomly assigned to recall the tasks in one of four different orders. A scripted explication of field and observer perspectives in memory was read verbally to all participants (see Rice & Rubin, 2009 for detailed script) and participants were given examples for practice to allow for the opportunity to ask questions. A recent review has suggested that these field and observer perspectives are better conceptualized as being independent, as opposed to complementary phenomena that reside on opposite ends of a continuum (Rice & Rubin, 2009); thus, memory perspectives were rated on separate scales (based on those used in McIsaac & Eich, 2002). Participants rated their memory on a total of five scales, which were used to assess the following: (A) the vividness and clarity of the memory, (B) the extent to which the memory occurred in the field (first-person) perspective, (C) the extent to which the memory occurred in observer (third-person) perspective, (D) the amount of positive emotion and (E) the amount of negative emotion associated with the experience. Responses to the five questions were rated on 7-point scales, where a ‘7’ represents vivid as if it were happening right now/completely first person/completely third person/completely positive/completely negative and a ‘1’ means not at all for all scales.

**Immediate Event Recall.** Individuals with a history of suicide attempts completed the author-revised Suicide Attempt Self-Injury Questionnaire (Linehan et al., 2006) and those with no history of suicide attempts were asked to identify and provide details about their most traumatic memory (see Measures).

Participants with a history of multiple suicide attempts were to recall their most medically severe suicide attempt, those with a history of one suicide attempt recalled that attempt, and participants with no history of attempts recalled their most traumatic memory. All participants were asked to rate their respective memories on the five scales (see above). Next, all participants were asked to recall a neutral event (i.e., their first day of psychology class) and rate their memories. The recall of the neutral event was randomized to occur before or after the recall of the suicide attempt/traumatic event.

At the conclusion of the in-lab portion of the study, participants scheduled a time for the delayed condition, which occurred over the phone. They were provided with the required study materials (i.e., the five rating scales, Affect grid) for the phone call.
Delayed Task Recall. Three days after performing the tasks, participants recalled and rated their memories of the remaining six tasks over the phone. Similar to the immediate condition, they rated each task recall on the five scales (see above).

Measures

Revised Suicide Attempt and Self-Injury Interview (SASII; Linehan et al., 2006). This self-report measure was adapted from the Suicide Attempt and Self-Injury Interview, a reliable and valid measure non-lethal suicide attempts (Linehan et al., 2006). This revised measure collects detailed information regarding the nature (e.g., method, intent, medical severity) of the first, most recent, and/or most medically severe suicide attempt, depending on which are applicable to the participant.

Negative Events Questionnaire. This author-created, 9-item measure assessed details regarding a negative and emotional event. Specifically, description, number of occurrences, age at the time, and any physical injuries associated with the event. Additionally, coping techniques used and whether they shared this event with others are assessed. The format and wording largely mirrored the details assessed on the SASII. Upon completing the first several questions from the revised SASII, participants who indicated no previous suicide attempts were directed to this questionnaire.

Interpersonal Needs Questionnaire - Belongingness (INQ-B; Van Orden et al., 2012). The INQ is a 15-item self-report questionnaire designed to measure participants’ connection to others (i.e., belongingness) and the extent to which they feel like a burden on the people in their lives (i.e., perceived burdensomeness). Nine items on the INQ are indicators of thwarted belongingness. Higher values indicate more severe symptoms of thwarted belongingness. The measure demonstrated good internal consistency (belongingness items, α = .85), and there is evidence for construct validity in a non-clinical sample (Van Orden et al., 2008). The INQ was used to measure levels of belongingness associated with the observer perspective and history of suicide-related behaviors. In the present study, reliability of the thwarted belongingness scale was excellent (Cronbach’s alpha = .91).

Depressive Symptom Inventory-Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997). The DSI-SS is a 4-item self-report measure designed to assess the frequency and intensity of suicidal thoughts and impulses in the previous two weeks. Each item is scored on a
4-point Likert scale ranging from 0 to 3 with total scores range from 0 to 12; higher scores reflect an increased severity of current suicidal ideation. Prior studies have reported good validity and psychometric properties for the measure (Joiner & Rudd, 1996). The DSI-SS was used to assess for individuals who have a history of suicidal ideation, or thoughts of suicide. In the present study, reliability was good (Cronbach’s alpha = .80).

Covariates

**Affect Grid (Russell et al., 1989).** The Affect Grid is a single-item scale that measures affect on a 9 x 9 grid along the two dimensions: valence, varying from extremely pleasant to extremely unpleasant, and arousal level, varying from high to low energy. The scale shows adequate reliability, convergent validity, and discriminant validity in a college student population for describing current mood (Jefferies et al., 2008). Participants rated their current mood on the Affect grid four times: prior to and after completing the tasks during immediate task recall, prior to event recall, and prior to recalling the tasks over the phone (i.e., delayed task recall). Given previous research indicating a relationship between mood and recall perspective (McIsaac & Eich, 2002), the mood grid was used to determine whether mood changes affected recall perspective.

**Beck Depression Inventory-II (BDI-II; Beck et al., 1996).** The BDI-II is a 21-item scale used to assess the presence and severity of depressive symptoms within the past week. Severity is assessed on a 4-point Likert scale, with responses ranging from 0 to 3. Higher scores are indicative of more severe depressive symptoms. The BDI-II is a reliable and valid measure for college student populations (Steer & Clark, 1997). Given the potential relationship between depressive symptoms and the dependent variables, field and observer perspectives (Kuyken & Mould, 2009), depressive symptoms were statistically controlled. Further, scores on the BDI-II were used to assess group differences in depressive symptoms. In the present study, reliability was excellent (Cronbach’s alpha = .90).

**Brief Fear Of Negative Evaluation Scale (BFNE; Leary, 1983).** This scale measures apprehension about, avoidance of evaluation, and expectations regarding negative evaluation. It contains 12 items rated on 5-point Likert scales ranging from 0 = "not at all characteristic of me" to 5 = "extremely characteristic of me". Reliability and validity for this scale has been established in undergraduate populations (Leary, 1983; Weeks et al., 2005). Given
the relationship between observer perspective and symptoms of social anxiety (Wells & Papageorgiou, 1999), this measure was used to assess for group differences and the effects of fear of negative evaluation on memory. In the present study, reliability was excellent (Cronbach’s alpha = .91).

**Problem Solving Inventory (PSI; Heppner & Petersen, 1982) - Problem Solving Efficacy (PSI-PSSE), and Problem Solving Skills (PSI-PSS) Scales.** The PSI-PSSE, which has 7 questions, and PSI-PSS, which has 9 questions, are based on a 35-item Likert-type inventory which measures "problem-solving appraisal," or the perception of one's problem-solving behavior and attitudes. The PSI and its new scales have previously demonstrated reliability and validity (Maydeu-Olivares, & D'zurilla, 1997). This scale was used to assess impairments in problem-solving abilities that may be related to third person memories and a history of previous suicide attempts. Both the PSI-PSS and the PSI-PSSE scales demonstrated adequate reliability in the present study (Cronbach’s alpha = .83 and .88, respectively).

**Vividness Of Visual Imagery Questionnaire (VVIQ; Marks, 1973).** The VVIQ is a measure of mental visual imagery vividness. This 16-item measure is assessed on a 5-point Likert scale. Lower mean values represent greater vividness and visualization ability. High levels of reliability, content validity and criterion validity were demonstrated in a meta-analysis of 150 studies (McKelvie, 1995). Evidence suggests that performance correlates with objective measures of early visual cortex activity and performance on a psychophysiological task (Cui, Jeter, Yang, Montague, & Eagleman, 2007). This measure was used to assess for individual differences in imagery ability. In the present study, reliability was good (Cronbach’s alpha = .84).

**Data Analyses**

All analyses were conducted using SPSS Statistics 22. Key study variables were examined descriptively. First, multiple regression analyses were employed to examine group differences on between participants with a history of suicide attempts, those with a history of suicidal ideation, and individuals without any history of suicidality on various outcome variables related to suicidality and/or memory recall (i.e., demographics, suicidal ideation, depressive symptoms, fear of negative evaluation, problem solving skills and self-efficacy, mood changes). Given the relationship between depressive symptoms and memory specificity, in all regression
analyses, depressive symptom (BDI total score), fear of negative evaluation, and mood prior to recall (i.e., prior to immediate recall, or prior to delayed recall) were statistically controlled. Notably, analyses were conducted without controlling for covariates and the pattern of findings remained the same. Full information maximum likelihood estimation was used to handle missing data, which were minimal.

**Immediate and Delayed Task Recall.** Multivariate regression analyses were used to examine the association between suicide attempt history and the memory perspectives, field and observer, and the potential change in perspective after a delay period of three days. Regression equations were generated with attempt status as a predictor. Attempt is a categorical variable with three levels: suicide attempters, suicide ideators, and controls (controls). This variable was coded such that 0 = no previous attempts or ideation, 1 = presence of suicidal ideation without an attempt, 2 = at least one previous suicide attempt. Given that Attempt status is a categorical variable, this variable was dummy coded – two dummy coded variables were generated. All dummy coded variables were entered into multiple regression equations predicting immediate and delayed field and observer perspective ratings. Dummy coded variables were also entered into equations predicting ratings of vividness, positive and negative affect. Additionally, to examine whether groups differ in their memory changed over time, the dummy-coded Attempt variables were entered as predictors of the difference between the average immediate and delayed ratings of field and observer perspective.

**Event Recall.** In order to examine group differences in recall perspective of a negative (i.e., suicide attempt, negative event) and neutral event (i.e., first day of psychology class), multiple regression equations were generated with Group (controls vs. suicide attempters) as predictor. Group1 was a categorical factor with two levels: controls, and suicide attempters. Two regression equations were generated: one to analyze the group differences in their average ratings of field and observer perspective for their negative event, and another to examine group differences in their neutral event. Ratings of vividness, positive and negative affect were also entered as dependent variables. Again, depressive symptoms (as measured by the BDI-II) and mood prior to recall were statistically controlled.

**Thwarted Belongingness.** A multiple regression equation was generated with thwarted belongingness as a predictor of memory perspectives, vividness, and positive and negative affect. Following the recommendations made by Shrout and Bolger (2002), the
bootstrap technique was used to assess for the potential mediating effects of the continuous variable, belongingness.

**Statistical Power.** An a priori power analysis for the present study was conducted using G*Power (Faul et al., 2007). The estimated effect size ($\eta^2=0.0289; f = 0.173$) was obtained from correlations found in a previous study of memory retrieval perspectives in individuals with depression (Kuyken & Moulds, 2009). Based on the estimated effect size with statistical significance set at $p < .05$, a total sample of 81 is required for sufficient power (0.80) to detect a relationship between history of suicide attempt and ideation, and memory perspective. A post-hoc power analysis indicated sufficient power (.95) to detect effects.
RESULTS

Multicollinearity was examined for all regression equations; tolerance and variance inflation factor values were within acceptable range (\(<.10\) or \(>10\), respectively). Suppression was also examined for all regression equations; beta values were within acceptable range (Beta \(<\) zero-order correlation). One variable, DSI-SS total score (S = 2.83), exhibited significant positive skew. To address the skew, square root transformations were used. This decreased the skew from 2.83 to 2.21. Univariate outliers (median +/- 2 interquartile ranges) were identified for Thwarted Belongingness and BDI total score. Outliers were addressed by bringing the score in question to the next highest value within two interquartile ranges. No bivariate outliers were identified. Of note, analyses were conducted with the outliers included and the pattern of findings remained the same.

Group Differences

Means and standard deviations of study variables are provided in Table 1; intercorrelations between main study variables are displayed in Table 2. Participants with a history of suicide attempts and suicidal ideation were not significantly different from controls on demographic variables (i.e., age, gender). As expected, suicide ideators (\(\beta = .22, t(2, 102) = 2.46, p = .016\), partial \(r^2\) (pr) = .06) and suicide attempters (\(\beta = .43, t(2, 102) = 4.83, p < .001, pr = .19\)) reported significantly higher suicidal ideation (total DSI-SS score) in comparison to controls. Additionally, compared to suicide ideators, suicide attempters reported significantly greater suicidal ideation (\(\beta = .18, p = .05, pr = .08\)), even after controlling for depressive symptoms (\(\beta = .20, p = .004\)). Compared to controls, suicide attempters reported significantly greater depressive symptoms (\(\beta = .25, t(2, 102) = 2.58, p = .011, pr = .06\)) and suicide ideators did not (\(\beta = .18, t(2, 102) = 1.81, p = .073, pr = .03\)), though findings indicate a trend towards higher depressive symptoms among ideators. Compared to controls, suicide attempters had significantly greater fear of negative evaluation (\(\beta = .19, t(2, 102) = 1.93, p = .056, pr = .04\)) and suicide ideators were not significantly different. With regards to belongingness, suicide ideators (\(\beta = .23, t(2, 102) = 2.41, p = .018, pr = .05\)), and suicide attempters (\(\beta = .30, t(2, 102) = 3.17, p = .002, pr = .09\)) had significantly higher thwarted belongingness than controls. Changes in mood from pre- and post-task completion did not differ significantly across groups. No differences emerged.
between groups with regards to their problem solving self-efficacy, problem solving skills, and vividness of visual imagery ability.

**Immediate Task Recall**

During the immediate recall condition, suicide attempters, compared to controls, recalled tasks significantly more from the field perspective ($\beta = .22$, $t(3, 93) = 2.08, p = .040, pr = .05$) and significantly less from the observer perspective ($\beta = -.22$, $t(3, 93) = -2.03, p = .036, pr = .05$). Suicide ideators were not significantly different from controls on the degree to which they recalled the tasks from the field ($\beta = .15$, $t(3, 93) = 1.43, p = ns$) and the observer ($\beta = -.09$, $t(3, 93) = -.91, p = ns$) perspective.

Ratings of immediate task recall vividness were not significantly different between controls and suicide ideators ($\beta = .11$, $t(3, 93) = 1.03, p = ns$) and suicide attempters ($\beta = .16$, $t(3, 93) = 1.47, p = ns$). Further, ratings of the positive affect associated with task recall were not significantly different between controls and suicide ideators ($\beta = -.008$, $t(3, 92) = -.07, p = ns$) and suicide attempters ($\beta = -.002$, $t(3, 92) = -.02, p = ns$). Similarly, ratings of negative affect associated with task recall were not significantly different between controls and suicide ideators ($\beta = -.03$, $t(2, 95 = -.31, p = ns$) and suicide attempters ($\beta = -.13$, $t(2, 95) = -1.23, p = ns$), without controlling for depressive symptoms as negative affect may overlap.

**Immediate Event Recall**

Time since the negative and emotional event was a significant predictor of the observer perspective during negative event recall ($\beta = .32, p = .004$). Results indicated that suicide attempters’ recall of a previous suicide attempt was not significantly different from suicide ideators’ and controls’ recalls of a negative event with regards to the field ($\beta = -.09, p = .80$) and observer ($\beta = .28, p = .44$) perspectives, vividness, and associated positive and negative affect, while controlling for time since the event. During the recall of the neutral event, suicide attempters recalled the events more from the field ($\beta = .24, t(1, 98) = 2.43, p = .017$) and less from the observer ($\beta = -.22, t(1, 98) = -2.24, p = .027$) perspective in comparison to suicide ideators and controls. There were no significant group differences in neutral event recall vividness and associated positive and negative affect.
Delayed Task Recall

Three days after completing the tasks, suicide attempters recalled tasks significantly more from the field perspective than controls ($\beta = .24$, $t(3, 89) = 2.33$, $p = .022$, $r = .06$). However, suicide attempters and controls were not significantly different on their observer perspective ratings ($\beta = -.16$, $t(3, 89) = -1.47$, $p = .15$). Again, suicide ideators were not significantly different from controls on field ($\beta = .05$, $t(3, 89) = .46$, $p = ns$) or observer perspective ($\beta = -.13$, $t(3, 89) = -1.22$, $p = ns$) ratings of their memories.

Ratings of delayed task recall vividness were not significantly different between controls and suicide ideators ($\beta = .05$, $t(3, 89) = .44$, $p = ns$) and suicide attempters ($\beta = .12$, $t(3, 89) = 1.16$, $p = ns$). Further, ratings of the positive affect associated with task recall were not significantly different between controls and suicide ideators ($\beta = .12$, $t(3, 89) = 1.17$, $p = ns$) and suicide attempters ($\beta = -.07$, $t(3, 89) = -.64$, $p = ns$). Similarly, ratings of negative affect associated with task recall were not significantly different between controls and suicide attempters ($\beta = -.10$, $t(2, 92) = -.00$, $p = ns$). However, control participants indicated significantly higher negative affect during delayed task recall than suicide ideators ($\beta = -.22$, $t(2, 92) = -2.17$, $p = .033$), without controlling for depressive symptoms.

Change from Immediate to Delayed Recall

Group did not significantly predict change from immediate to delayed recall field perspective, observer perspective, vividness, and positive and negative affect.

Thwarted Belongingness

Thwarted belongingness was not significantly related to immediate field ($\beta = -.14$, $p = .26$) and observer ($\beta = .09$, $p = .47$), and delayed field ($\beta = -.15$, $p = .22$) and observer ($\beta = .09 , p = .48$) perspectives. No significant differences between thwarted belongingness and vividness, and positive and negative affect emerged. As such, analyses with thwarted belongingness as a mediator between group and memory perspective were not conducted.

Exploratory Analyses

Given that suicide attempters were not significantly different from controls in their negative event recall, follow-up regression analyses were conducted to examine whether there
were significant differences between observer perspective ratings of negative event and other types of recall. Specifically, group was entered as a predictor of observer perspective rating change between the types of recall, controlling for depressive symptoms and time since the negative and emotional event. Suicide attempters and controls differed significantly in their observer perspective ratings during negative event and immediate task recall ($\beta = -.21, t(3, 93) = -2.01, p = .05, pr = .04$); however, there were no significant differences between controls and suicide ideators ($\beta = -.02, p = ns$). No significant differences between observer perspective ratings for negative and neutral events between controls and suicide ideators ($\beta = -.18, p = ns$) and attempters ($\beta = .04, p = ns$). Similarly, there were no significant differences between negative event and delayed task recall observer perspective between controls and suicide ideators ($\beta = -.19, p = ns$), and attempter ($\beta = -.02, p = ns$).
DISCUSSION

As suicidal ideation represents a key risk factor for future suicidal behavior (Nock et al., 2008), greater understanding of the cognitive processes associated with suicidality is important for the prevention and treatment of suicide. Despite some evidence to suggest that suicide attempts are associated with impairments in memory processes (Pollock & Williams, 2001), to date, there has been very little research examining memory functioning in individuals with a history of suicidality. This study sought to investigate the task and event recall perspectives of individuals with a history of suicide attempts and current suicidal ideation, those with current suicidal ideation, and those without any symptoms of suicidality. Notably, the present findings were robust against important covariates associated with suicidality and memory (e.g., depressive symptoms, mood). Results indicated that individuals with a history of suicide attempts, compared to controls, recalled memories of tasks completed in the lab less from the observer perspective and more from the field perspective. Although there is evidence to suggest that memories transition to the observer perspective with time, the present results indicated that despite the age of the memory, individuals with a history of suicide attempts maintained a more field and less observer perspective bias in memory compared to controls.

Though unexpected, these findings are in line with previous studies suggesting that across a wide range of contexts and actions, most individuals adopt a field perspective in recall and the observer perspective is assumed in a minority of past events (Rice & Rubin, 2009). That individuals with a history of suicide attempts recalled memories less from the observer perspective than controls contradicts research indicating that suicide is motivated by desires to escape from aversive self-awareness and emotion (Baumeister, 1990). The observer perspective is often employed to distance oneself from memories involving some level of self-consciousness or self-awareness (e.g., for some, giving a public talk; Rice & Rubin, 2009). Thus, the present findings suggest that individuals with a history of suicide attempts are less likely than controls to view oneself from the third person as a means of avoidance. Given that memories recalled from the field perspective tend to be more specific and detail-oriented than those recalled from the observer perspective, the current results are more consistent with research indicating that individuals at risk for suicide tend to exhibit clear and specific suicidal ideation (i.e., clear desire for suicide, high specificity in their suicide plan, explicit suicidal intent; Joiner et al., 1999).
Importantly, as modes of representation, neither field nor observer perspective is, on its own, tied securely to reality. Just as a film that is shot solely from the point of view of one character would fail to appreciate the multifaceted nature of reality, partiality for one perspective leaves a memory incomplete. A significantly greater field, or internal and personal, focus and, simultaneously, little focus on the outside, objective perspective may bias reality for individuals with a history of suicide attempts. This significant and rigid focus on one perspective may be another facet of cognitive inflexibility, which has been shown to increase feelings of hopelessness and suicidal ideation (Miranda, Valderrama, Tsypes, Gadol, & Gallagher, 2013).

The field perspective is also associated with experiencing strong emotional reactions and intense emotions, regardless of valence (Talarico, LaBar, & Rubin, 2004). This suggests that individuals with a history of suicide attempts, compared to those without such history, may internalize and focus strongly on their emotions when recalling events. This is consistent with research indicating that suicidality is associated with a tendency to make internal attributions for negative outcomes (c.f. negative cognitive style; Miranda & Nolen-Hoeksema, 2007). A field perspective bias among individuals with a history of suicide attempts may further intensify negative emotions associated with memories, thereby increasing the internalization of the negative aspects of the situation. Though the present findings did not indicate any differences in negative affect between groups, suicide attempters reported greater fears of negative evaluation. It is possible that differences in negative affect and field perspective biases may be more prominent in future studies using tasks that involve greater personal threat or failure.

The same pattern of perspective findings emerged when individuals with a history of suicide attempts were asked to recall a neutral event. However, individuals with a history of suicide attempts viewed memories more from an observer perspective when recalling the negative or traumatic event compared to tasks. Given that the observer perspective may serve as a form of cognitive avoidance when recalling past traumatic events (Kenny & Bryant, 2007; McIsaac & Eich, 2004), one possibility is that individuals recalling a previous suicide attempt, which was likely negative and relatively traumatic, used a more observer perspective as a way to emotionally distance from the memory. It is also possible, however, given that we were unable to control for the content of the memory, confounding variables may have masked significant results. Future studies examining the recall perspective of suicide attempts, traumatic/negative
and neutral events specifically among individuals with varying histories of suicidality would be informative.

In the present study, suicide ideators were not significantly different from controls in their task and event recall perspectives. This suggests that suicidal behavior, and not suicidal thinking, may impact cognitive processes related to the perspective from which memories are recalled. This is congruent with research indicating that a history of suicidal behavior is a greater risk factor for future death by suicide than suicidal ideation (Nock et al., 2008). However, the nature of the link between memory perspectives and suicidal behavior remains to be determined with further study.

One hypothesis tested in this study is the possibility that memory perspective biases contribute to symptoms of thwarted belongingness, which is associated with increased suicidal desire (Van Orden et al., 2010). Contrary to expectations, thwarted belongingness was not significantly related to recall perspectives. This would suggest that other factors not assessed in this study may contribute to the link between memory perspectives and suicidality. Research suggests that the capability for suicide, another construct of the interpersonal theory, may be influenced by mental rehearsal (Van Orden et al., 2010) and thus, may be useful a fruitful avenue for understanding the role of memory perspectives in suicide.

Although previous research indicating that individuals with a history of suicide attempts exhibit over-general memories, the current findings indicate that individuals with a history of suicide attempts tend to recall memories from the detailed and specific field perspective. This suggests that individuals with a history of suicide attempts may have deficits in the recall perspective that are associated with difficulties recalling specific as opposed to nonspecific memories. Future studies examining the potential relationship between over-general memories, memory perspective, and suicidality are indicated.

Findings and implications of this study should also be considered in the context of other limitations. As perspectival aspects of our memories are not often explicit in conscious awareness, for most participants, recall perspectives were a relatively unfamiliar concept. As such, one limitation of this research is our inability to verify, beyond verbally ascertaining their understanding, whether participants were able to mentally visualize these perspectives. Findings
may have also been confounded by participant reactivity as some may have attempted to see memories from an unnatural perspective. However, reactivity is likely minimal as participants were reminded to rate the perspective without changing their memory. Another limitation is the use of a moderate sample size. Given the relatively low base rate of elevated suicide risk and relatively small sample, it is possible that insufficient statistical power precluded the detection of a small yet potentially clinically meaningful effect. As such, larger sample sizes may be more appropriate in future studies. The present results may also be influenced by third variables associated with suicidal ideation, such as cognitive inflexibility, brooding and rumination (Miranda & Nolen-Hoeksema, 2007). Future studies examining whether these variables may have facilitated the relationship between memory perspectives and suicidal ideation are indicated.

Overall, the findings of the present investigation provide evidence that individuals with a history of suicide attempts shows a significant bias toward recalling memories from a field, or first person, perspective and less from the observer, or third person perspective, which suggests a tendency towards internally focused memories. This study was the first to examine the recall perspectives of individuals with a history of suicidality. Thus, replication of these findings in other samples is a crucial next step. We look forward to future studies that replicate and extend the present findings in an effort to better understand the cognitive processes associated with suicidal thoughts and behavior.
### Table 1

**Study variable means (standard error of the mean)**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Controls</th>
<th>Suicide Ideators</th>
<th>Suicide Attempters</th>
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<tr>
<td></td>
<td>N = 107</td>
<td>n = 74</td>
<td>n = 14</td>
<td>n = 17</td>
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<td><strong>Demographics</strong></td>
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<tr>
<td>Age (years)</td>
<td>19.3 (.24)</td>
<td>19.0</td>
<td>19.5</td>
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<td># of previous suicide attempts</td>
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<td>0</td>
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<tr>
<td>Suicidal ideation (DSI-SS)</td>
<td>.39 (.10)</td>
<td>.12 (.05)</td>
<td>.75 (.37)</td>
<td>1.43 (.47)</td>
</tr>
<tr>
<td><strong>Immediate Task Recall</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field</td>
<td>5.84 (.11)</td>
<td>5.72 (.13)</td>
<td>6.13 (.24)</td>
<td>6.19 (.33)</td>
</tr>
<tr>
<td>Observer</td>
<td>2.40 (.13)</td>
<td>2.51 (.16)</td>
<td>1.87 (.32)</td>
<td>2.28 (.27)</td>
</tr>
<tr>
<td>Vividness</td>
<td>5.77 (.10)</td>
<td>5.68 (.13)</td>
<td>5.93 (.23)</td>
<td>6.06 (.18)</td>
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<tr>
<td>Positive Affect</td>
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<td>4.48 (.14)</td>
<td>4.53 (.40)</td>
<td>4.47 (.34)</td>
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<td>Negative Affect</td>
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<td>2.29 (.12)</td>
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<td>1.90 (.29)</td>
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<td></td>
<td></td>
<td></td>
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<td>5.16 (.23)</td>
<td>5.25 (.58)</td>
<td>5.58 (.53)</td>
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<td>Observer</td>
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<td>Vividness</td>
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<td>4.92 (.43)</td>
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<td>Positive Affect</td>
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<td>2.75 (.65)</td>
<td>1.17 (.11)</td>
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<td>Negative Affect</td>
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<td><strong>Immediate Neutral Event Recall</strong></td>
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<td>Vividness</td>
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<td><strong>Delayed Task Recall</strong></td>
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<td>Field</td>
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<td>5.06 (.14)</td>
<td>5.10 (.46)</td>
<td>5.81 (.35)</td>
</tr>
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<td>Vividness</td>
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<td>Negative Affect</td>
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<td><strong>Covariates</strong></td>
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<td>Depressive symptoms (BDI)</td>
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<td>7.59 (.64)</td>
<td>11.53 (2.55)</td>
<td>12.88 (3.04)</td>
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<td>Fear of negative evaluation (BFNE)</td>
<td>37.42 (1.00)</td>
<td>36.69 (1.10)</td>
<td>36.14 (3.20)</td>
<td>42.06 (2.83)</td>
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<td>Thwarted belongingness (INQ-B)</td>
<td>21.37 (1.09)</td>
<td>18.96 (1.01)</td>
<td>26.43 (4.00)</td>
<td>28.25 (3.52)</td>
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<td>Problem solving self-efficacy (PSI-PSSE)</td>
<td>18.59 (.63)</td>
<td>18.65 (.78)</td>
<td>17.5 (1.02)</td>
<td>19.70 (2.10)</td>
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<tr>
<td>Problem solving skills (PSI-PSS)</td>
<td>23.14 (.71)</td>
<td>23.35 (.84)</td>
<td>21.93 (2.18)</td>
<td>23.30 (2.29)</td>
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<td>Vividness of visual imagery (VVIQ)</td>
<td>2.02 (.05)</td>
<td>1.98 (.06)</td>
<td>2.05 (.16)</td>
<td>2.21 (.13)</td>
</tr>
</tbody>
</table>
Table 1 - continued

Note. DSI-SS = Depressive Symptom Inventory-Suicidality Subscale total score. BDI = Beck Depression Inventory total score. BFNE = Brief Fear of Negative Evaluation Scale total score. INQ-B = Interpersonal Needs Questionnaire – Belongingness Subscale score. PSI-PSSE = Problem Solving Inventory – Problem Solving Self Efficacy scale. PSI-PSS = Problem Solving Inventory – Problem Solving Skills scale. VVIQ = Vividness of Visual Imagery Questionnaire. N ranged from 94-107 due to missing variables.
Table 2.

Zero-order correlations among key study variables

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<td>9. Observer (N)</td>
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<td>-.06</td>
<td>-.19</td>
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<td>-.11</td>
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</table>

Note: * p < .05  *** p < .001.

<sup>a</sup> coded controls = 0, suicide ideators = 1, suicide attempters = 2

I = Immediate task recall condition. D = Delayed task recall condition. E = Suicide attempt and negative event recall condition. N = Neutral event recall condition.

Ideation = suicidal ideation, Depressive Symptom Inventory-Suicidality Subscale; Belonging = thwarted belongingness, Interpersonal Theory of Suicide Belongingness Subscale; Depression = depressive symptoms, Beck Depression Inventory-II; Neg. Eval. = fear of
negative evaluation, Brief Fear of Negative Evaluation Scale; PS Efficacy = problem solving self-efficacy, Problem Solving Inventory. PS Skills = problem solving skills, Problem Solving Inventory. Vividness = visual imagery ability, Vividness of Visual Imagery Questionnaire.
APPENDIX A

IRB APPLICATION, APPROVAL, AND CONSENT FORM

Human Subjects Application For Full IRB and Expedited Exempt Review

1. Project Title and Identification

1.1 Project Title

Memory Perspective & Mental Rehearsal: Role of Cognitions in Suicidal Behavior

Project is: Thesis

1.2 Principal Investigator (PI)

| Name (Last name, First name MI): | Chu, Carol |
| Mailing Address: | |
| University Department: | PSYCHOLOGY DEPARTMENT |
| The training and education completed in the protection of human subjects or human subjects records: | CITI |

| Highest Earned Degree: | Bachelor's Degree |
| Phone Number: | |
| Fax: | |

| Email: | |

| Occupational Position: | Student |

1.3 Co-Investigators/Research Staff

| Name (Last name, First name MI): | Buchman, Jennifer M.; Co-Investigator |
| Mailing Address: | |
| University Department: | PSYCHOLOGY DEPARTMENT |
| The training and education completed in the protection of human subjects or human subjects records: | NIH |

| Highest Earned Degree: | Bachelor's Degree |
| Phone Number: | |
| Fax: | |

| Email: | |

| Occupational Position: | Student |
APPROVAL MEMORANDUM (for change in research protocol)

Date: 06/06/2013

To: Carol Chan

Address: 1107 West Call Street, Tallahassee, FL, 32306

Dept: PSYCHOLOGY DEPARTMENT

From: Thomas L. Jacobson, Chair

Re: Use of Human subjects in Research
Project entitled: Memory Perspective & Mental Rehearsal: Role of Cognitions in Suicidal Behavior

The application that you submitted to this office in regard to the requested change/amendment to your research protocol for the above-referenced project has been reviewed and approved.

Please be reminded that if the project has not been completed by 12/11/2013, you must request renewed approval for continuation of the project.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: HSC NO. 2013.10048
Background:
We would welcome your participation in a study that aims to investigate peoples’ reactions to a variety of manual tasks and the ability to tolerate pain. Participation is voluntary and you may decide not to participate or to withdraw at any time.

Purpose:
This is a study that will attempt to look at the effects of performing manual tasks on subjects and factors that affect pain tolerance.

Study Procedures:
The study will be divided into two sessions: you will be asked to come into the lab for a 1 hour and 45 minute session and then a 15 minute phone conversation will be arranged for three days after the in-lab session. During Part 1 of the first session, you will be asked to perform numerous tasks over a 30-minute period and then later questioned about the effects of the manual labors on you. Periodically, you will be asked to provide ratings of mood as well. In Part 2 of the first in-lab session, pain tolerance will be measured using a device called a pressure algometer. This device will be placed on your dominant hand on the area between the thumb and middle fingers. Pressure will gradually increase in that area. When you feel that pressure becomes too uncomfortable to continue, you will simply need to say “stop” and the device will be immediately removed. At the end of the in-lab session, you will also fill out a series of questionnaires on the computer.

The second session is a phone conversation that will take place 3 days after the first session. The phone conversation will last about 15 minutes. Remember you can also decline to participate now or at any point during the study if you no longer wish to continue.

Compensation:
At the conclusion of the second session, you will receive a verbal account of the study’s aims and methods, as well as 2 credit points for
Risks:
The risks in this study are minimal. Some people may experience some anxiety, frustration, or become emotionally upset with the questionnaires or other tasks of this study. Since some of the questions will ask about suicide, for your safety, I will be reviewing your responses. In the event that you respond to some questions in a way that suggest you may benefit from further resources, I will ask that you meet with a trained graduate student to discuss them further and provide you with further resources, if necessary or at your request. Also, some of the tasks of the experiment may be physically uncomfortable but that discomfort is relatively mild and temporary.

Confidentiality:
All of the information you provide will be kept strictly confidential. No information that discloses your identity will be released or published without your specific consent. Your identity will not be used in any reports about the study. In records that leave this lab you will be identified by a study code only. All information associated with this study will be stored in a locked cabinet in the laboratory. All other forms will be numerically coded, and access to these forms will be restricted to the principal investigator, co-investigator and their designated research assistants. Your rights to privacy are legally protected and guaranteed by federal and provincial laws that require safeguards to insure that your privacy is respected and also give you the right of access to the information about you that has been provided to the sponsor and, if need be, an opportunity to correct any errors in this information.

Contact for information about the study:
If you have any questions of desire further information with respect to this study, you may contact Carol Chu at [redacted] Jennifer Buchman at [redacted] or the faculty advisor for this project, Thomas E. Joiner at [redacted] and [redacted]

Contact for concerns about the rights of research subjects:
If you have concerns about your treatment or rights as a research subject you may contact the Research Compliance Hotline in the FSU Office of Research Services at (850) 644-8836.
CONSENT TO PARTICIPATE

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without jeopardy to your [employment, class standing, access to further services from the community center, day care, etc.].

Your signature indicates that you consent to participate in this study.

_________________________________________  _____________
Participant Signature                          Date

_________________________________________
Printed Name of the Participant signing above.
REFERENCES


BIOGRAPHICAL SKETCH

Carol Chu was born in Ottawa, Ontario, Canada in 1990. She attended the University of British Columbia, where she graduated with a Bachelor of Science degree in Psychology in 2012. She is currently a graduate student at the doctoral program in Clinical Psychology at Florida State University. Broadly, Carol’s research interests relate to cognition and memory and their associations with suicidal behavior.