

City University of New York (CUNY)

## CUNY Academic Works

---

Theses and Dissertations

Hunter College

---

Summer 8-6-2018

### **Certainty about the Absence of Positive Future Events as a Unique Predictor of Suicidal Ideation over an 18-Month Period**

Christina A. Rombola  
*CUNY Hunter College*

[How does access to this work benefit you? Let us know!](#)

More information about this work at: [https://academicworks.cuny.edu/hc\\_sas\\_etds/362](https://academicworks.cuny.edu/hc_sas_etds/362)

Discover additional works at: <https://academicworks.cuny.edu>

---

This work is made publicly available by the City University of New York (CUNY).  
Contact: [AcademicWorks@cuny.edu](mailto:AcademicWorks@cuny.edu)

Certainty about the Absence of Positive Future Events as a Unique Predictor  
of Suicidal Ideation over an 18-Month Period

by

Christina Rombola

Submitted in partial fulfillment  
of the requirements for the degree of  
Master of Arts General Psychology, Hunter College  
The City University of New York

2018

Thesis Sponsor: Dr. Regina Miranda, Ph.D.

August 6, 2018  
Date

Dr. Regina Miranda, Ph.D.  
Signature

August 6, 2018  
Date

Dr. Evelyn Behar, Ph.D.  
Signature of Second Reader

### Acknowledgments

I would like to express my sincere gratitude to my mentors, Dr. Regina Miranda and Dr. Evelyn Behar, for their wonderful support and guidance through the completion of this project. Many thanks to all members of the Miranda Lab, past and present, for all of their encouragement, accolades, and assistance, and who are inspiring to me in their own right. I would also like to thank Ms. Karolina Czech, Dr. Sandeep Prasada, and Dr. Martin Chodorow for their assistance throughout my course in the MA program and for always fielding my many questions! My heartfelt thanks as well to all of my family, friends, coworkers, former teachers, and fellow students whom I have had the sincere privilege of knowing and whose kindness and perseverance I will never forget.

## Abstract

Few studies have examined the precise cognitive mechanisms that may predict suicidal ideation (SI). Depressive predictive certainty is a dichotomous construct used to conceptualize how hopelessness can lead to SI and is comprised of certainty about the absence of positive future events (Certainty-AP) and certainty about the occurrence of negative future events (Certainty-N). In the present study, data from a nonclinical sample of 354 young adults in the New York City metropolitan area followed over an 18-month period were analyzed to assess the predictive utility of these constructs. We hypothesized that Certainty-AP would more strongly predict higher SI at 18 months from baseline than Certainty-N, beyond the effects of depressive symptoms, and that hopelessness would partially mediate this relationship. Further, we hypothesized that low positive future-event fluency (PFEF) would moderate the relationship between Certainty-AP and higher levels of SI at 18 months. Results indicated that T1 Certainty-AP significantly predicted 18-month SI while Certainty-N did not, but not independently of generalized hopelessness or depressive symptoms. Further, depressive symptoms, and not hopelessness, fully mediated this relationship. Low PFEF did not moderate the effects of baseline Certainty-AP or Certainty-N on 18-month SI, but Certainty-AP and Certainty-N significantly moderated the effects of low baseline PFEF on 18-month SI. These findings suggest that Certainty-AP may lead to future SI via depressive symptoms, and that future SI may increase as a function of high depressive predictive certainty and low PFEF. An integration of these cognitive models of suicidal ideation and potential clinical implications are discussed.

*Keywords:* depressive predictive certainty, depression, hopelessness, future-event cognitions, suicidal ideation, negative future thinking, pessimism, longitudinal, prospective, youth

Certainty about the Absence of Positive Future Events as a Unique Predictor  
of Suicidal Ideation over an 18-Month Period

Suicide is a widespread and pervasive phenomenon of serious concern for families and clinicians. Of particular interest is suicide among young adults, who are at elevated risk for suicidal ideation and attempts (Mortier et al., 2017; Piscopo, Lipari, Cooney, & Glasheen, 2016). Suicide is the second leading cause of death among individuals aged 10-34 years in the United States (CDC, 2016). Recent findings have also indicated that 4% of individuals aged 18 or older in the United States reported suicidal thoughts in 2015, and that serious suicidal ideation was most prevalent among young adults aged 18-25 years (Piscopo et al., 2016). As per a recent meta-analysis by Mortier et al. (2017), approximately 1 in 4 college students report having experienced thoughts of suicide. Adolescents hospitalized for a suicide attempt have been found to be at elevated risk for repeat attempts within 6-12 months (Goldston et al., 1999) and within 1-2 years (Goldston et al., 1999; Prinstein et al., 2008) following the index attempt. Notably, other meta-analyses have suggested that over 80% of adolescents hospitalized for suicidal ideation or attempts have received some form of mental health treatment (Nock et al., 2013). These trends prompt concern regarding the long-term efficacy of treatments targeted to adolescents and young adults who may be susceptible to suicidal thoughts or behaviors and underscore the need for interventions that home in on relevant risk factors for suicide.

With regard to terminology, *suicide* has been defined as “the act of intentionally ending one’s own life”; *suicidal ideation* as “thoughts of engaging in behavior intended to end one’s life”; and *suicide attempt* as “engagement in potentially self-injurious behavior in which there is at least some intent to die” (Nock et al., 2008, p. 134). Efforts to identify clinical predictors of suicidal ideation and attempts have led to the establishment of several key risk factors: mood and

anxiety disorders (e.g. Beautrais, 2000; Nock et al., 2010; MacLeod, Pankhania, Lee, & Mitchell, 1997), namely major depressive disorder, generalized anxiety disorder (Gilmour, 2016), and substance dependence disorder, as well as previous suicide attempts (Lewinsohn, Rohde, & Seeley, 1994), and a history of non-suicidal self-injury (Gutierrez, Osman, Barrios, & Kopper, 2001; Pérez Rodriguez, Marco Salvador, & García-Alandete, 2017). In addition, cognitive behaviors such as *rumination*, defined as “repeated thoughts about the causes, meaning, and consequences of one’s negative mood” (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), have been linked to suicidal ideation, as well as cognitive risk factors including negative attributional style (Abramson, Metalsky, & Alloy, 1989), and hopelessness (e.g. Beck, Steer, Kovacs, & Garrison, 1985; Beck, Steer, Beck, & Newman, 1993). Hopelessness has been identified as a key mediator in the relationship between rumination and depression (Andersen, 1990) as well as suicide (Smith, Alloy, & Abramson, 2006) and has been defined by early conceptualizations as “a system of cognitive schemas whose common denomination is negative expectations about the future” (Beck Weissman, Lester, & Trexler, 1974, p. 864).

Conceptually, hopelessness has been distinguished from pessimism in that it refers to one’s existing negative views of the future, whereas pessimism has been considered an enduring personality trait (O’Connor & Conway, 2007). Andersen (1990) identified hopelessness as a “proximal cognitive predictor” of depression, and further defined the construct in terms of *depressive predictive certainty*, the belief that positive future outcomes will not occur whereas negative future outcomes will occur. This is distinguished from pessimism, which Andersen defines as an individual’s likelihood estimations of positive and negative events, specifically that positive events are unlikely and negative events are likely to occur. According to Andersen, individuals become hopeless once they reach the point of 100% certainty about an absence of

positive future outcomes and the presence of negative future outcomes, and upon feeling powerless to alter such events (Andersen & Lyon, 1987). This formulation is derived from the *hopelessness theory of depression*, coined by Abramson et al. (1989), which posits that hopelessness is a “proximal sufficient cause,” that is, an etiological factor that increases the likelihood of depressive symptoms, rather than a symptom of depression. According to this theory, an individual possessing a depressive attributional style is thought to become depressed by way of his or her negative appraisals of past events, which confer hopeless expectations about the future. Lack or absence of positive future expectations has also been conceptualized in the cry of pain model of suicidality (Williams, 2001) as a diminished “rescue factor”, that is, a feature thought to protect against suicidal behavior. This model proposes that stress confers risk for suicidal thinking or behavior by way of three mechanisms: perceived defeat, feelings of entrapment, and low anticipation of rescue. In effect, the individual feels powerless to alter undesired occurrences that he or she believes to be inevitable. In a test of this model, Rasmussen et al. (2010) found that low levels of positive future thinking compounded the effects of entrapment in predicting suicidal ideation. In considering these theories alongside Beck’s cognitive triad, which proposes that depression develops from negative views of the self, the world, and the future (Beck, Rush, Shaw, & Emery, 1979), an individual’s appraisal of undesired future events and the certainty that they will occur would appear to carry strong implications for suicide risk.

Depressive predictive certainty has been significantly associated with increased depressive symptoms (Andersen, 1990). In Andersen’s (1990) study, which utilized a nonclinical sample of young adults, individuals scoring high on a measure of depressive symptoms were found to generate more hopeless future predictions than their less depressed or nondepressed

counterparts, anticipating negative events as more likely and positive events as less likely with greater degrees of certainty. Extant research on the potential link between depressive predictive certainty and suicidal ideation as well as depression remains limited, and particularly work that aims to examine the differential impact of certainty about the absence of positive future events versus certainty about the occurrence of negative future events. However, high levels of certainty when anticipating the absence of positive future outcomes has been more strongly associated with suicidal ideation than negative outcome certainty, even independently of depression (Sargalska, Miranda, & Marroquin, 2011). By contrast, a study of a nonclinical sample of young adults found that certainty about negative future outcomes, but not certainty about the absence of positive future outcomes, mediated the relationship between suicide attempt history and future suicidal ideation even after adjusting for generalized hopelessness and depressive symptoms, but with little variation in scores on the two predictive certainty domains (Krajniak, Miranda, & Wheeler, 2013).

Research on the relationship between hopelessness and depression bears further mentioning, and particularly on how these constructs may interact to predict suicidal thoughts and behaviors. Generalized hopelessness, as contrasted with depressive predictive certainty, refers to hopelessness as measured by the Beck Hopelessness Scale (Beck & Steer, 1988) and does not incorporate the “certainty” construct. Horwitz et al. (2017) examined participant scores on the positive and negative expectation subscales of the BHS separately as potential predictors of suicidal ideation and attempts, and found evidence to suggest that low positive future expectancies more strongly predicted SI and SA. Miranda, Fontes, and Marroquin (2008) found support for the mediational role of hopelessness on depressive predictive certainty in predicting depression, specifically that hopelessness fully mediated the relationship between certainty about

the absence of positive future events and depressive symptoms, while partially mediating the relationship between certainty about the occurrence of negative future events and depressive symptoms. Further, the authors found that anticipating an absence of positive future outcomes was significantly associated with an increase in depressive symptoms, but not symptoms of generalized anxiety disorder (GAD). By contrast, increased anticipation of negative future outcomes was more strongly associated with combined depression and GAD, a finding that supported previous work by Miranda and Mennin (2007). Similar findings by MacLeod and Byrne (1996) showed that fewer positive future expectancies were generated by individuals with anxiety and depression, but not anxiety only, and that levels of hopelessness were more elevated among the former group. MacLeod and Salaminiou (2001) also found evidence of reduced positive future expectations relative to controls, which was correlated with higher levels of depression, but not anxiety. This clinical distinction between anxiety and depression appears to comport with Clark and Watson's (1991) tripartite model, which suggests that these disorders share a "general distress factor" (p. 316) that may be characterized by a broad range of aversive states, e.g. upset, anger, fear, or sadness, also termed "negative affectivity" (p. 320). In addition, the model suggests that depression may be distinguished from anxiety in that it is specifically characterized by low or absent positive affectivity, which refers to feelings of energy and positive engagement and can lead to feelings of fatigue and anhedonia when not present (Watson, Clark, & Carey, 1988). Neuroticism, a facet of personality as defined in the Five-Factor Model (McCrae & Costa, 1991), also encompasses broad aversive features such as anxiety, hostility, impulsivity, and depression, and has been associated with increased risk for the development of depressive symptoms and suicidal ideation (Rappaport, Flint, & Kendler, 2010). Among individuals with depression, those who meet criteria for moderate and even mild severity

have demonstrated lower levels of positive future thinking than nondepressed controls, but no significant differences from controls on negative future thinking (Bjärehed, Sarkohi, & Andersson, 2010). These effects have also been displayed among individuals who have engaged in nonfatal suicidal behavior (Hunter & O'Connor, 2003).

In addition to the certainty component of positive and negative future thinking, the amount of cognitive fluency with which an individual generates positive and negative event predictions has been associated with suicidal ideation and attempts (e.g. MacLeod, Rose, & Williams, 1993). In developing the Future Thinking Task (FTT), a measure used to assess future-event cognitive fluency, MacLeod et al. (1993) determined that anticipating the absence of positive future outcomes is functionally distinct from anticipating the presence of negative future outcomes, and that reduced ability to generate positive future event predictions is more strongly related to depression than increased ability to generate negative predictions, particularly with regard to specific self-oriented future predictions. Reduced ability to generate positive future thoughts for oneself but not for others has also been found among self-injuring adults and has been attributed to an impaired ability to appraise favorable personally-relevant goals as attainable (MacLeod & Conway, 2007). In a modification of the FTT that required participants to yield likelihood estimates of positive and negative future events, as well as ratings of how happy or unhappy they would feel if each outcome was to occur, MacLeod et al. (1998) found that patients who engaged in self-injury with suicidal intent unknown generated significantly fewer positive future expectations, but not more negative future expectations, than controls.

Some work suggests that depressed individuals generate greater amounts of negative future expectations and lesser amounts of positive future expectations with greater automaticity than their nondepressed counterparts, even under conditions of added attentional load (Andersen

& Limpert, 2001; Andersen, Spielman, & Bargh, 1992). A study employing a measure of implicit future thinking in depression found that subclinically depressed individuals generated fewer positive future expectations than controls but did not significantly differ from controls in their likelihood estimates of future events (Kosnes et al., 2013). A study of hospitalized patients compared the power of low positive future expectancies with generalized, self-reported hopelessness to determine the better predictor of suicidal ideation, and found that the former more strongly predicted ideation after approximately 2.5 months from hospital discharge, while negative future expectancies did not independently predict ideation (O'Connor, Fraser, Whyte, MacHale, & Masterson, 2008). Furthermore, hopelessness has been linked to latency in generating both specific positive and negative future event predictions when adjusting for depression (MacLeod & Cropley, 1995), and negative attributional style (O'Connor, Connery, & Cheyne., 2000).

In consideration of the above extant findings, the aims of the present study were twofold: (1a) to examine the differential impact of Certainty-AP versus Certainty-N on severity of future SI over an 18-month period, as well as (1b) the mediating roles of generalized hopelessness and depressive symptoms in the relationship between Certainty-AP versus Certainty-N and SI at 18-month follow up; and (2) to determine the extent to which positive future-event fluency moderates the relationship between Certainty-AP and future SI at 18-month follow up. Based on the findings of the cross-sectional study by Sargalska et al. (2011), we hypothesized that: (1a) Certainty-AP would more strongly predict high levels of SI at 18-month follow-up than Certainty-N, with (1b) hopelessness partially mediating this relationship more strongly for Certainty-AP than Certainty-N. Further, we hypothesized that low but not high levels of positive future event fluency would significantly moderate the relationship between Certainty-AP and

higher levels of SI. While no previous studies to our knowledge have examined the interaction between positive future-event fluency (PFEF) and Certainty-AP versus Certainty-N on later SI, some work has found evidence for the moderating role of PFEF in the relationship between stress and hopelessness (O'Connor, O'Connor, O'Connor, Smallwood, & Miles, 2004). Factors adjusted in our analyses included demographic variables, baseline depressive symptoms, and generalized hopelessness.

### **Method**

The present study employed a longitudinal design to build upon preliminary work by Sargalska et al. (2011), which utilized a cross-sectional design to examine the differential impact of Certainty-AP and Certainty-N on suicidal ideation, with hopelessness partially mediating both relationships. Measures were administered at the initial screening phase, baseline assessment (1 month from initial screening), and at follow-up periods at 3 months, 12 months, and 18 months from the baseline assessment.

### **Participants**

Our data were collected in the years between 2010 and 2015 from a non-clinical sample of individuals aged 18-34 years ( $M = 19.08$ ,  $SD = 2.22$ ), recruited from a large public college in the New York City Metropolitan area and enrolled in an introductory psychology course, or from the general community local to this area via newspaper or web-based advertisements. At initial screening, 2,540 individuals were recruited and administered measures assessing suicidal ideation in the previous 6 months or lifetime suicide attempt history, as described below. A subsample of 354 participants completed the baseline, first session, and between 0-3 of the follow-up assessments, 278 of whom completed all sessions and measures. The final sample was 74% female and the racial/ethnic breakdown was as follows: 32% Asian, 30% White, 19%

Hispanic, 11% Black, and 8% mixed/other ethnicity. Additionally, 84% identified as heterosexual. Overall, 40% of the final sample reported some history of suicidal ideation or attempt, while the remaining 60% reported no history of suicidal ideation or attempt. Twenty percent met criteria for a mood disorder (45% for any psychiatric diagnosis) within the previous year, and the retention rate from baseline to the final phase of the study was 83%. Of the 354 participants, 23% endorsed suicide ideation within the 6-months prior to baseline, 24% endorsed at least one lifetime suicide attempt (2% in the previous year), and 47% reported no history of suicidal ideation or attempt. By 18 months from baseline, 3% of participants reported having suicide attempts over the course of this study, and 10% endorsed suicidal ideation within the previous 6 months. Eleven percent of our sample reported having participated in mental health treatment due to previous suicide attempts, and only 9% reported receiving current treatment at baseline and at 18-month follow-up.

### **Measures**

**Demographic Information Questionnaire.** A battery of questions was developed specifically for this study and administered to all participants at initial screening, which was comprised of items assessing age, gender, race/ethnicity, nation of origin (of participants and their parents), number of years as a United States resident, current year in school, and sexual orientation.

**Suicidal Behavior Screening (SBS).** The SBS is a measure developed specifically for this study, consisting of 6 items derived from the Diagnostic Interview Schedule for Children (DISC; Shaffer et al., 2000), and was administered to detect the presence of suicidal ideation and/or attempts within the previous year, previous 6 months, and any history of lifetime ideation and/or attempts. Four items addressing current and historical mental health treatment were also

included, which ask if treatment was received following suicide attempts (if applicable), the type of treatment at that time (e.g., psychotherapy, pharmacological, etc.), if mental health treatment was currently received, and the type of present treatment, if yes.

**Beck Depression Inventory, Second Edition (BDI-II; Beck, Steer, & Brown, 1996).**

The BDI-II is a 21-item self-report measure assessing clinical features of depression over the last two weeks. Each item consists of a statement to which participants indicate agreement using responses coded on a Likert scale from 0 (e.g. “I do not feel sad”) to 3 (e.g. “I am so sad and unhappy that I can’t stand it”), with some items reverse-scored. A total scaled score is calculated from responses to all questions and can range from 0 to 63. Scores between 21-30 are considered indicative of moderate, 31-40 of severe, and 41 or higher of extreme clinical depression. The BDI has demonstrated high internal consistency and convergent validity in a large body of work utilizing clinical and nonclinical samples (Beck et al., 1996; Whisman et al., 2000; Storch, Roberti, & Roth, 2004). The scale demonstrated high internal consistency in the present study ( $\alpha = .92$ ), with and without the inclusion of item 9, which assesses suicidal ideation. In the present study, baseline scores ranged from 0-56 for depressive symptoms ( $M = 16.33$ ,  $SD = 10.99$ ).

**Beck Hopelessness Scale (BHS; Beck & Steer, 1988).** The BHS is a 20-item self-report measure administered to assess level of overall hopelessness about the future. Each item consists of a statement addressing hopeless expectations about the future, to which participants indicate their agreement with a response of “true” or “false”. The scale includes 11 negatively-phrased (e.g. “My future seems dark to me”) and 9 positively-phrased (e.g. “I look forward to the future with hope and enthusiasm”) items, with some items reverse-scored. Each response of “true” to a negative and “false” to a positive item is counted towards a total score ranging from 0-20. The index of hopelessness severity is as follows: 0-3 minimal, 4-8 mild, 9-14 moderate, and 15-20

severe (Cochrane-Brink, Lofchy, & Sakinofsky, 2000). High internal consistency as well as convergent and discriminant validity have been reported for the BHS (Steed, 2001), and this scale demonstrated high internal consistency in the present study ( $\alpha = .97$ ). Baseline scores on hopelessness ranged from 0-19 ( $M = 5.40$ ,  $SD = 4.60$ ).

**Beck Scale for Suicidal Ideation (BSS; Beck & Steer, 1991).** The BSS is a 21-item self-report measure used to assess active and passive suicidal thoughts experienced within the past week, including the present day. Each item requires participants to select from a set of 3 statements that best describes how they have been feeling, and responses are coded on a 0-2 scale (i.e., 0 = “I have a moderate to strong wish to live.”; 1 = “I have a weak wish to live.”; 2 = “I have no wish to live.”). Items 20 and 21 address the occurrence of one or more past suicide attempts and the severity of one’s wish to during the last attempt but are not included in the total score. The total score is calculated from responses to questions 1-19 and can range from 0 to 38. A score of 3 is considered indicative of higher suicide risk (Beck & Steer, 1991). The BSS has demonstrated good internal consistency as well as construct and concurrent validity among adolescent populations (Holi et al., 2005). High internal consistency was found for the BSS in our study ( $\alpha = .87$ ). SI scores at T1 ranged from 0-29 ( $M = 2.67$ ,  $SD = 5.17$ ) and from 0-15 at T4 ( $M = 0.78$ ,  $SD = 2.51$ ).

**Future Events Questionnaire (FEQ; Miranda & Mennin, 2007; see also Andersen, 1990).** The FEQ is a 34-item measure used to assess depressive predictive certainty. It is comprised of 17 positive and 17 negative future events arranged in random order, for which participants are asked to indicate “yes” or “no” as to whether each event is likely to happen to them, and to rate their degree of certainty about these predictions on a 5-point Likert scale from 1 (“not at all certain”) to 5 (“as certain as one can be”). Two total scores are calculated: the number

of “no” responses to positive future events with certainty ratings of “5” (Certainty-AP), and the number of “yes” responses to negative future events with certainty ratings of “5” (Certainty-N). This scale demonstrated high internal consistency in our study, both for the Certainty-AP ( $\alpha = .87$ ) and Certainty-N subscales ( $\alpha = .91$ ), consistent with prior work (Miranda & Mennin, 2007). Baseline Certainty-AP scores ranged from 0-7 ( $M = 0.35$ ,  $SD = 0.98$ ), while baseline Certainty-N scores ranged from 0-12 ( $M = 1.51$ ,  $SD = 2.23$ ).

**Computerized Diagnostic Interview Schedule for Children - Young Adult Version** (C-DISC; Shaffer et al., 2000). The C-DISC is a structured clinical interview designed to measure symptoms of various mental disorders according to criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV). It is designed to be administered by lay interviewers, clinicians, or for participant self-administration. The computerized assessment presents a series of questions to be read by the interviewer, to which the participant provides yes/no responses. Diagnoses are established by means of a computer algorithm. In this study, the C-DISC was used to assess for clinical disorders present within the past month and past year of baseline assessment. While the original instrument was intended for use with children and adolescents, the young adult version is tailored to individuals older than 17 years (Shaffer et al., 1998). Additionally, it is considered particularly advantageous in that it adheres closely to precise diagnostic criteria as stated in the DSM-IV and ICD-10 manuals (Shaffer et al., 2000).

**Future Thinking Task** (FTT; MacLeod, Rose, & Williams, 1993). The FTT is a measure employed to assess positive and negative future-event fluency. Participants were asked to generate as many positive (or negative, in a separate task) events they expect to experience over three separate time periods: within the next week, the next year, and the next 5-10 years,

with one minute allowed for each condition. The order in which conditions were presented was counterbalanced, and participants were verbally prompted by an experimenter, to whom they verbally delivered all responses aloud. The experimenter recorded and coded all responses by hand. Two total scores were calculated as follows: positive future-event fluency and negative future-event fluency (i.e. the total number of positive/negative future events generated across all conditions). In the present study, aggregate totals of the number of future events generated were collapsed across all three conditions (next week, next year, next 5-10 years) and computed separately for positive and negative future events. This practice is in keeping with prior studies, as no effects have been found for time period (MacLeod et al., 2005). The number of positive future events generated ranged from 0-35 ( $M = 15.79$ ,  $SD = 5.26$ ), while the number of negative future events generated ranged from 0-28 ( $M = 13.21$ ,  $SD = 4.91$ ).

### **Procedure**

Participants were initially screened in groups of 4-8 individuals in a private classroom space at a large public college in the New York City Metropolitan area, from which much of the sample was recruited. At the screening phase, participants were administered the SBS, BHS, BDI-II, BSS, and FEQ. The baseline phase of this study (T1) was conducted approximately one month after initial screening, using a subsample of 354 participants stratified by suicidal ideation and attempt history. Participants returned individually and completed the C-DISC and FTT. At each follow-up phase (3 months, 12 months, and 18 months from baseline; T2, T3, and T4, respectively), participants completed the FTT, SBS, BHS, BDI-II, BSS, FEQ, and items indicating the presence and type of any current treatment received. At each phase of the study, additional measures assessing constructs outside of the scope of the present paper were also administered.

## Results

### Group Differences and Correlations among Study Measures

All analyses were run using IBM SPSS Statistics Version 24.0. A series of one-way ANOVA tests were conducted to examine potential differences in our study variables by demographic category, and revealed that there was no significant omnibus difference in T4 SI for race/ethnicity,  $F(4, 293) = 1.75, n.s.$ , as was the case for sexual orientation,  $F(5, 293) = 0.76, n.s.$ , and gender,  $F(1, 293) = 0.66, n.s.$  There was a significant gender difference on T1 Certainty-AP,  $t(333) = 2.27, p < .05$ , with females reporting higher Certainty-AP ( $M = 0.40, SD = 1.10$ ) than males ( $M = 0.21, SD = 0.48$ ), but no other significant gender differences were found for other study variables.

A series of correlations were examined between T4 SI and scores on several clinical predictors at T1, T2, and T3. There was a significant positive correlation between T1 Certainty-AP and T1 SI,  $r(353) = .34, p < .01$ , as well as T4 SI,  $r(293) = .12, p < .05$ . T1 Certainty-AP was also significantly correlated with T1 and T4 depressive symptoms,  $r(353) = .44, p < .01$ ;  $r(293) = .24, p < .01$ , respectively, and with T1 and T4 hopelessness,  $r(351) = .40, p < .01$ ;  $r(293) = .24, p < .01$ , respectively. Certainty-AP and Certainty-N at T1 were strongly correlated,  $r(353) = .54, p < .01$ . However, there was no significant correlation between T1 Certainty-N and T4 SI,  $r(293) = .10, n.s.$  A significant relationship was found between T1 Certainty-AP and PFEF-T1,  $r(353) = -.20, p < .01$ , but not NFEF-T1,  $r(353) = .00, n.s.$  For all correlations, see Table 1.

### Certainty-AP as a Unique Predictor of Suicidal Ideation

A series of hierarchical multiple regression analyses were conducted to examine the ability of T1 Certainty-AP to predict T4 SI when adjusting for several important covariates. Prior to adjusting for other predictors, a simple linear regression found a significant total effect for T1

Certainty-AP in predicting T4 SI,  $b = 0.31$ ,  $SE = 0.15$ ,  $p < .05$ ;  $F(1, 291) = 4.50$ ,  $p < .05$ ;  $R^2 = .015$ . By contrast, T1 Certainty-N did not yield a significant total effect on T4 SI,  $b = 0.11$ ,  $SE = 0.07$ ,  $n.s.$ ;  $F(1, 291) = 3.05$ ,  $n.s.$ ;  $R^2 = .010$ . In our first hierarchical regression, we examined the effect of T1 Certainty-AP when adjusting for T1 depressive symptoms. T1 depressive symptoms was entered into Block 1, and T1 Certainty-AP into Block 2. In this model, Certainty-AP no longer significantly predicted T4 SI,  $b = -0.10$ ,  $SE = 0.16$ ,  $n.s.$ , although the overall model was significant,  $F(2, 290) = 18.97$ ,  $p < .01$ , with an  $R^2 = .116$  and adjusted  $R^2 = .110$ , indicating that these predictors accounted for about 11% of the variance in T4 SI. For full results of this regression, see Table 2.

Our second analysis examined the effect of T1 Certainty-AP (entered in Block 2) when controlling for T1 hopelessness (Block 1). As with T1 depressive symptoms, T1 Certainty-AP no longer significantly predicted T4 SI when controlling for T1 hopelessness,  $b = 0.01$ ,  $SE = 0.15$ ,  $n.s.$  Our model was significant,  $F(2, 288) = 14.12$ ,  $p < .01$ , with an  $R^2 = .089$  and adjusted  $R^2 = .083$ , indicating that these predictors accounted for about 8.3% of the variance in T4 SI. For full results of this regression, see Table 3.

### **The Mediational Effects of Hopelessness and Depressive Symptoms on the Relationship between Certainty-AP and Suicidal Ideation versus Certainty-N and Suicidal Ideation**

Given the strong relationships between T1 Certainty-AP, hopelessness, depressive symptoms, and T4 SI, a series of serial mediation analyses were conducted using both hopelessness and depressive symptoms at T3. These analyses were performed using the PROCESS Macro for SPSS and SAS version 3.0 (Hayes, 2018). In our first analysis, our variables were entered as follows: T1 Certainty-AP (X), T3 hopelessness (M1), T3 depressive symptoms (M2), and T4 SI (Y). Results indicated that our model was significant,  $F(3, 279) =$

14.47,  $p < .01$ , and that T3 depressive symptoms, but not T3 hopelessness, significantly mediated the effect of T1 Certainty-AP on T4 SI,  $b = 0.21$ ,  $SE = 0.08$ , 95% CI: 0.07, 0.40. T1 Certainty-AP no longer significantly predicted T4 SI once controlling for T3 depressive symptoms,  $b = -0.02$ ,  $SE = 0.16$ , *n.s.*, consistent with full mediation. Approximately 13.5% of the variance in SI was accounted for in this model,  $R^2 = .135$ , and indirect effects were tested using a bootstrap estimation approach with 5,000 resamples. For the full results of this analysis, see Figure 1.

Our second serial mediation analysis was conducted to examine the potential mediational impact of T3 depressive symptoms and T3 hopelessness on the relationship between T1 Certainty-N and T4 SI. Our variables were entered as follows: T1 Certainty-N (X), T3 hopelessness (M1), T3 depressive symptoms (M2), and T4 SI (Y). Results indicated that T3 depressive symptoms, and not T3 hopelessness, significantly mediated the T1 Certainty-N and T4 SI relationship,  $b = 0.08$ ,  $SE = 0.03$ , 95% CI: 0.03, 0.16, as with the T1 Certainty-AP and T4 SI relationship. The overall model fit was significant,  $F(3, 279) = 14.57$ ,  $p < .01$ . Approximately 13.5% of the variance in T4 SI was accounted for by these predictors,  $R^2 = .135$ , and indirect effects were tested using a bootstrap estimation approach with 5,000 resamples. For the full results of this analysis, see Figure 2.

### **Future-Event Fluency as a Moderator of the Certainty-AP and Suicidal Ideation**

#### **Relationship**

To address our second aim, a series of moderation analyses were also conducted using PROCESS to test whether T4 SI increased as a function of high T1 Certainty-AP and low positive future-event fluency. In our first analysis, we examined T1 Certainty-AP as our predictor and PFEF-T1 as our moderator. Our second hypothesis was not supported, as no significant interaction effect was found for PFEF-T1 on this relationship,  $b = -.03$ ,  $SE = .03$ , *n.s.*,

and the overall regression model was not significant,  $F(3, 289) = 2.00, n.s.$  We further examined these potential interaction effects using PFEF at T2,  $b = -9.06, SE = 0.04, n.s.; F(3, 281) = 2.44, n.s.,$  T3,  $b = -0.04, SE = 0.03, n.s.; F(3, 279) = 2.16, n.s.,$  and T4,  $b = 0.06, SE = 0.03, n.s.; F(3, 289) = 2.93, p < .05,$  none of which were significant, although the latter relationship was a non-significant trend ( $p = .058$ ).

An alternate configuration of these variables was also considered to explore the PFEF and Certainty-AP relationship with T4 SI, using PFEF-T1 as our predictor variable and T1 Certainty-AP as our moderator. While T1 Certainty-AP did not significantly moderate the relationship between PFEF-T1 and T4 SI, significant interaction effects were found for Certainty-AP at T2,  $b = -0.12, SE = 0.03, p < .01; F(3, 283) = 9.16; p < .01,$  T3,  $b = -0.11, SE = 0.03, p < .01; F(3, 280) = 10.59; p < .01,$  and T4,  $b = -0.12, SE = .04, p < .01; F(3, 288) = 8.89; p < .01,$  on the PFEF-T1 and T4 SI relationship. The Johnson-Neyman technique showed that these relationships were significant when Certainty-AP was higher than 0.26 at T2,  $b = -.06, SE = .03, p = .05,$  0.38 at T3,  $b = -.06, SE = .03, p = .05,$  and 0.31 at T4,  $b = -.06, SE = .03, p = .05.$

In light of these findings, we were interested in examining the potential interaction effects of PFEF on Certainty-N and T4 SI, as well as Certainty-N on PFEF and T4 SI. As with Certainty-AP, no significant interaction effects were found for PFEF at T1, T2, T3, or T4 on the T1 Certainty-N and T4 SI relationship. However, when PFEF-T1 was entered as predictor and Certainty-N as moderator, a significant effect was found for Certainty-N at T4,  $b = -0.04, SE = 0.01, p < .01; F(3, 288) = 11.12; p < .01.$  The Johnson-Neyman technique showed that this relationship was significant when Certainty-N was higher than 0.47,  $b = -.05, SE = .03, p = .05.$  Certainty-N at T1, T2, or T3 were also examined separately as moderators of the PFEF-T1 and T4 SI relationship, but there were no significant effects.

### Discussion

In accordance with our first hypothesis, T1 Certainty-AP significantly predicted suicidal ideation at T4 prior to adjusting for other covariates, while T1 Certainty-N displayed no such significant relationship. As suggested in previous literature (Miranda et al., 2008), an explanation for this finding may be that a high degree of Certainty-AP confers greater risk for the development of depression than would Certainty-N, and perhaps in severe cases, thoughts about suicide. While high Certainty-N may likewise be indicative of hopelessness and depressive symptoms, the ability to acknowledge the potential for positive future events to occur, even when highly certain about negative outcomes, may be protective against the long-term effects of negative future expectancies. This would support Andersen's (1990) theory that an individual becomes hopeless upon reaching 100% certainty about the inevitability of both the occurrence of negative future events and nonoccurrence of positive future events. Even while experiencing thoughts of undesired potential outcomes in one's future, one does not truly reach the threshold of hopelessness if one retains some sense of *hope*, however seemingly vague, that personally-relevant desired events can transpire. It is the point at which an individual perceives negative events and an absence of positive events to be truly inevitable that he/she puts forth much reduced efforts to alter those likelihoods in a favorable direction (Andersen, 1990; Andersen & Limpert, 2001; Andersen et al., 1992). However, it is important to note that once adjusting for generalized hopelessness and depressive symptoms, Certainty-AP no longer significantly predicted SI at 18-month follow-up. This contrasts with the findings of Sargalska et al. (2011) and may suggest that while Certainty-AP more strongly predicts future suicidal ideation than Certainty-N, it does not operate independently of generalized hopelessness or depressive symptoms over an 18-month period. Rather, it may be the case that these constructs operate in

concert with each other, with Certainty-AP and Certainty-N homing in on the more specific cognitive processes nested within the greater clinical picture of hopelessness and depression. The shared variance among these clinical variables in predicting later suicidal ideation may serve as evidence for the general distress factor described by Clark and Watson (1991) in their tripartite model of anxiety and depression. One's certainty that positive future outcomes will not occur may be one component leading to the development of depressive symptoms and potentially suicidal ideation, but may be subsumed under the umbrella of low or absent positive affectivity in fulfilling that function.

Our serial mediation analysis using hopelessness and depressive symptoms at T3 in our study demonstrated that the direct effect of T1 Certainty-AP on T4 SI lost significance once each mediator was entered, and that the depressive symptoms, but not hopelessness, significantly accounted for this relationship. The same held true for the baseline Certainty-N and 18-month SI relationship, though less strongly than with Certainty-AP. This suggests that depressive predictive certainty can lead to suicidal ideation via depressive symptoms, with more general feelings of hopelessness leading to the development of those symptoms. These findings lend support for Abramson et al.'s (1989) model by demonstrating that Certainty-AP may operate via hopelessness in predicting depressive symptoms and, at high levels of severity, future suicidal ideation. In work utilizing an older adult sample, Conaghan and Davidson (2002) found that depression emerged as a stronger mediator than hopelessness in the relationship between reduced positive future thinking and suicidal behavior.

To address our second aim, we sought to explore the potential moderating influence of low positive-future event fluency at baseline (PFEF-T1) on the relationship between baseline Certainty-AP and 18-month SI. To our knowledge, this is the first examination of the conceptual

interaction between future-event fluency and depressive predictive certainty, as these constructs have previously been examined separately. Thus, we sought to address this gap in the literature and integrate these cognitive predictors of suicide. An unexpected finding was that our second hypothesis, that low fluency in generating positive future events would moderate the effect of high baseline Certainty-AP on high 18-month SI, was not supported. However, we found significant effects when inserting Certainty-AP at 6 months, 12 months, and 18 months as a moderator of the baseline PFEF and 18-month SI relationship.

By contrast, no significant interaction effects were found using PFEF at any of the four time points as a moderator of the baseline Certainty-N and 18-month SI relationship, and only Certainty-N at 18 months significantly moderated the effects of baseline PFEF on 18-month SI. A possible explanation for this finding could be that depressive predictive certainty does not precede, but emerges in response to, one's decreased ability to generate thoughts about positive future events. In other words, one becomes certain about the low likelihood (or absence) of desired future outcomes upon realizing that he/she is unable to think of any specific such occurrences, and not vice versa. This would comport with Andersen and colleagues' "certainty-as-efficiency hypothesis," which posits that when pessimistic future expectancies come to mind effortlessly, one comes to view those outcomes as unavoidable (Andersen et al., 1992). Further, our finding that Certainty-AP significantly moderated the effect of baseline PFEF on 18-month SI at three time points (6 months, 12 months, and 18 months), as opposed to one (18 months) for Certainty-N, appears to align with our first hypothesis that Certainty-AP is more strongly predictive of future SI than Certainty-N, and provides support for previous theories that underscore the functional distinction between these two constructs. The stronger association between PFEF and Certainty-AP may suggest that these constructs are more closely linked than

PFEF and Certainty-N. It may be plausible that one can feel highly certain about the occurrence of negative future events without necessarily failing to generate thoughts of positive future events as much as would be the case when highly certain about no positive future events. In addition, PFEF and Certainty-AP at T2, T3, and T4 and PFEF and Certainty-N at T4 may have significantly predicted T4 SI due to closer temporal proximity to the 18-month time follow-up period.

### **Strengths**

A potential strength of this study was the racial and ethnic diversity of our sample, which was utilized to overcome the limitations of homogeneity, given that predominantly White samples have frequently been employed in similar research (Cha et al., 2017). Our sample was also thought to be fairly representative of the broader New York City Metropolitan population. In addition, the use of nonclinical participants was useful in illuminating potential risk factors that may predict future suicidal thoughts or behaviors irrespective of clinical diagnosis or history of suicidal ideation or attempt.

The utility of the assessments we used to measure our variables of interest also warrants some attention. The FTT has been cited as advantageous in examining future-event fluency due to its open-ended format, wherein individuals are asked to generate a list of expected personally-relevant future events (MacLeod et al., 1993). This may yield a more meaningful measurement of the underlying cognitive processes that may be impaired in depressed individuals than might be captured by traditional self-report measures. The FEQ, by contrast, presents a list of preformulated future events, but which are thought to be generalizable to most populations, though particularly young adults given the inclusion of items that may apply more to this age group than to older adults, e.g. items addressing future job satisfaction (Miranda & Mennin,

2007). The measure is thought to extend beyond other measures of pessimism in that individuals are asked to rate their certainty that each event will occur, in addition to its likelihood.

### **Limitations**

Our use of a nonclinical sample to measure suicidal ideation may have also presented this study with several important limitations. First, the low scores of this sample on Certainty-AP, Certainty-N, and SI at baseline and 18-month follow up are expected to be significantly lower than scores found among clinical samples, and thus may be of limited generalizability to such populations, and interpreted with caution. Further, an important conceptual issue with regard to our predictors must be addressed: Certainty-AP, by definition, requires that an individual be convinced about an absolute absence of desirable future outcomes in his/her life, which would presumably necessitate an inability to generate thoughts of any positive future events whatsoever, and not merely low frequencies of such thoughts. It is worth noting that only four participants (three at baseline, one at 12-month follow up) yielded PFEF scores of “0”, indicating that no positive future thoughts were generated for either the next week, next year, or next 5-year conditions. While it may be the case that a more clinically depressed and suicidal sample would generate higher Certainty-AP and lower PFEF scores, it seems logical to suggest that even relatively high and low scores on these domains, respectively, can serve as meaningful indicators of potential suicidal ideation risk. It is expected that complete certainty about the absence of positive future events and inability to generate thoughts of likely such events may not frequently be found, especially among nonclinical samples and as captured in self-report measures as part of voluntary psychological research participation.

As an additional note, our results may be largely relevant to females given the high percentage of female participants (74%). The general limitations of utilizing self-report measures

also bear mentioning; for example, some often-cited criticisms of such measures include the problem of demand characteristics, especially if a measure is readministered in the same study (Gemar, Segal, Sagrati, & Kennedy, 2001), as was the case in ours, and the lack of suitability for measuring underlying cognitive schemata that may operate outside of one's awareness (Gotlib & Krasnoperova, 1998). It is possible that positive and negative future expectancies as captured by our measures may have been influenced by transient mood states present during each assessment rather than enduring future-event schemata. The longitudinal design of this study was expected to account for such a phenomenon, but it is plausible that the depressive predictive certainty and cognitive fluency scores yielded at each time point could be attributed to circumstantial events. Further, our findings may be circumscribed to young adults given the age range of our sample, and additional research examining how these constructs operate in other populations will be instructive.

### **Conclusion**

A negative view of one's future has been cited as the most important component of Beck's cognitive triad in predicting the development of depression (Roepke & Seligman, 2016), which appears to underscore the potential impact of depressive predictive certainty on suicidal thoughts and behaviors. However, not everyone who is depressed has thoughts about suicide; so it is important to carefully examine the precise mechanisms that may be at work in the progression from depressed to suicidal thoughts. Further research on depressive predictive certainty employing similar longitudinal designs and clinical samples may be warranted to examine the utility of Certainty-AP in predicting future suicidal ideation more broadly. We propose that depressive predictive certainty, namely Certainty-AP, and its relationship with future-event fluency will extend the concept of hopelessness beyond the formulation as measured

by the BHS. More frequent use of the measures of future-event fluency and depressive predictive certainty in future studies may provide fine-grained insights into the kinds of hopelessness-related cognitions experienced by at-risk young adults that may be crucial to better streamlining prevention and treatment interventions targeted to this age group, and to broadening awareness of how these specific cognitive processes may confer risk for suicidal ideation and potentially suicidal behavior.

## References

- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, *96*, 358-372.
- Andersen, S. M. (1990). The inevitability of future suffering: The role of depressive predictive certainty in depression. *Social Cognition*, *8*, 203-228.
- Andersen, S. M., & Limpert, C. (2001). Future-event schemas: Automaticity and rumination in major depression. *Cognitive Therapy and Research*, *25*, 311-333.
- Andersen, S. M., & Lyon, J. E. (1987). Anticipating undesired outcomes: The role of outcome certainty in the onset of depressive affect. *Journal of Experimental Social Psychology*, *23*, 428-443.
- Andersen, S. M., Spielman, L. A., & Bargh, J. A. (1992). Future-event schemas and certainty about the future: Automaticity in depressives' future-event predictions. *Journal of Personality and Social Psychology*, *63*, 711-723.
- Beautrais, A. L. (2000). Risk factors for suicide and attempted suicide among young people. *Australian and New Zealand Journal of Psychiatry*, *34*, 420-436.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York: The Guilford Press.
- Beck, A. T., & Steer, R. A. (1988). *Manual for the Beck Hopelessness Scale (BHS)*. San Antonio, TX: Psychological Corporation.
- Beck, A. T., & Steer, R. A. (1991). *Manual for the Beck Scale for Suicide Ideation (BSS)*. San Antonio, TX: Psychological Corporation.

- Beck, A. T., Steer, R. A., Beck, J. S., & Newman, C. F. (1993). Hopelessness, depression, suicidal ideation, and clinical diagnosis of depression. *Suicide and Life-Threatening Behavior, 23*, 139-145.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II (BDI-II)*. San Antonio, TX: Psychological Corporation.
- Beck, A. T., Steer, R. A., Kovacs, M., & Garrison, B. (1985). Hopelessness and eventual suicide: A 10-year prospective study of patients hospitalized with suicidal ideation. *American Journal of Psychiatry, 142*, 559-563.
- Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The hopelessness scale. *Journal of Consulting and Clinical Psychology, 42*, 861-865.
- Bjärehed, J., Sarkohi, A., & Andersson, G. (2010). Less positive or more negative? Future-directed thinking in mild to moderate depression. *Cognitive Behaviour Therapy, 39*, 37-45.
- Centers for Disease Control and Prevention. (2016). 10 Leading Causes of Death, United States: 2016, All Races, Both Sexes. *WISQARS: National Center for Health Statistics (NCHS), National Vital Statistics System*. Retrieved on January 11, 2018 from <https://webappa.cdc.gov/sasweb/ncipc/leadcause.html>.
- Cha, C. B., Tezanos, K. M., Peros, O. M., Ng, M. Y., Ribeiro, J. D., Nock, M. K., & Franklin, J. C. (2017). Accounting for diversity in suicide research: Sampling and sample reporting practices in the United States. *Suicide and Life-Threatening Behavior, 48*, 131-139.
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100*, 316-336.

- Cochrane-Brink, K. A., Lofchy, J. S., & Sakinofsky, I. (2000). Clinical rating scales in suicide risk assessment. *General Hospital Psychiatry, 22*, 445-451.
- Conaghan, S., & Davidson, K. M. (2002). Hopelessness and the anticipation of positive and negative future experiences in older parasuicidal adults. *British Journal of Clinical Psychology, 41*, 233-242.
- Gemar, M. C., Segal, Z. V., Sagrati, S., & Kennedy, S. J. (2001). Mood-induced changes on the Implicit Association Test in recovered depressed patients. *Journal of Abnormal Psychology, 110*, 282-289.
- Gilmour, H. (2016). Threshold and subthreshold Generalized Anxiety Disorder (GAD) and suicide ideation. *Health Reports, 27*, 13-21.
- Goldston, D. B., Daniel, S. S., Reboussin, D. M., Reboussin, B. A., Frazier, P. H., & Kelley, A. E. (1999). Suicide attempts among formerly hospitalized adolescents: A prospective naturalistic study of risk during the first 5 years after discharge. *Journal of the American Academy of Child & Adolescent Psychiatry, 38*, 660-671.
- Gotlib, I. H., & Krasnoperova, E. (1998). Biased information processing as a vulnerability factor for depression. *Behavior Therapy, 29*, 603-617.
- Gutierrez, P. M., Osman, A., Barrios, F. X., & Kopper, B. A. (2001). Development and initial validation of the Self-Harm Behavior Questionnaire. *Journal of Personality Assessment, 77*, 475-490.
- Hayes, A. F. (2018). The PROCESS Macro for SPSS and SAS version 3.0 [Computer software]. Retrieved from [afhayes.com](http://afhayes.com).

- Holi, M. M., Pelkonen, M., Karlsson, L., Kiviruusu, O., Ruuttu, T., Heilä, H., ...Marttunen, M. (2005). Psychometric properties and clinical utility of the Scale for Suicidal Ideation (SSI) in adolescents. *BMC Psychiatry, 5*, 1-8.
- Horwitz, A. G., Berona, J., Czyz, E. K., Yeguez, C. E., & King, C. A. (2017). Positive and negative expectations of hopelessness as longitudinal predictors of depression, suicidal ideation, and suicidal behavior in high-risk adolescents. *Suicide and Life-Threatening Behavior, 47*, 168-176.
- Hunter, E. C., & O'Connor, R. C. (2003). Hopelessness and future thinking in parasuicide: The role of perfectionism. *The British Journal of Clinical Psychology, 42*, 355-365.
- Kochanek, K. D., Murphy, S. L., Xu, J., & Arias, E. (2017). Mortality in the United States, 2016. NCHS Data Brief, Number 293. *National Center for Health Statistics (NCHS), National Vital Statistics System, Mortality*. Retrieved on January 11, 2018 from <https://www.cdc.gov/nchs/data/databriefs/db293.pdf>.
- Kosnes, L., Whelan, R., O'Donovan, A., & McHugh, L.A. (2013). Implicit measurement of positive and negative future thinking as a predictor of depressive symptoms and hopelessness. *Consciousness and Cognition, 22*, 898-912.
- Krajniak, M., Miranda, R., & Wheeler, A. (2013). Rumination and pessimistic certainty as mediators of the relation between lifetime suicide attempt history and future suicidal ideation. *Archives of Suicide Research, 17*, 196-211.
- Lewinsohn, P. M., Rohde, P., & Seeley, J. R. (1994). Psychosocial risk factors for future adolescent suicide attempts. *Journal of Consulting and Clinical Psychology, 62*, 297-305.

- MacLeod, A. K., & Byrne, A. (1996). Anxiety, depression, and the anticipation of future positive and negative experiences. *Journal of Abnormal Psychology, 105*, 286-289.
- MacLeod, A. K., & Conway, C. (2007). Well-being and positive future thinking for the self versus others. *Cognition and Emotion, 21*, 1114-1124.
- MacLeod, A. K., & Cropley, M. L. (1995). Depressive future thinking: The role of valence and specificity. *Cognitive Therapy and Research, 19*, 35-50.
- MacLeod, A. K., Pankhania, B., Lee, M., & Mitchell, D. (1997). Parasuicide, depression and the anticipation of positive and negative future experiences. *Psychological Medicine, 27*, 973-977.
- MacLeod, A. K., Rose, G. S., & Williams, J. M. G. (1993). Components of hopelessness about the future in parasuicide. *Cognitive Therapy and Research, 17*, 441-455.
- MacLeod, A. K., & Salaminiou, E. (2001). Reduced positive future-thinking in depression: Cognitive and affective factors. *Cognition and Emotion, 15*, 99-107.
- MacLeod, A. K., Tata, P., Evans, K., Tyrer, P., Schmidt, U., Davidson, K., ...Catalan, J. (1998). Recovery of positive future thinking within a high-risk parasuicide group: Results from a pilot randomized controlled trial. *British Journal of Clinical Psychology, 37*, 371-379.
- MacLeod, A. K., Tata, P., Tyrer, P., Schmidt, U., Davidson, K., & Thompson, S. (2005). Hopelessness and positive and negative future thinking in parasuicide. *British Journal of Clinical Psychology, 44*, 495-504.
- McCrae, R. R., & Costa, P. T. (1991). The NEO Personality Inventory: Using the Five-Factor Model in counseling. *Journal of Counseling & Development, 69*, 367-372.

- Miranda, R., Fontes, M., & Marroquín, B. (2008). Cognitive content-specificity in future expectancies: Role of hopelessness and intolerance of uncertainty in depression and GAD symptoms. *Behaviour Research and Therapy, 46*, 1151-1159.
- Miranda, R., & Mennin, D. S. (2007). Depression, generalized anxiety disorder, and certainty in pessimistic predictions about the future. *Cognitive Therapy and Research, 31*, 71-82.
- Mortier, P., Cuijpers, P., Kiekens, G., Auerbach, R., Demyttenaere, K., Green, J., ...Bruffaerts, R. (2017). The prevalence of suicidal thoughts and behaviours among college students: A meta-analysis. *Psychological Medicine, 1-12*. doi:10.1017/S0033291717002215
- Nock, M. K., Borges, G., Bromet, E. J., Cha, C. B., Kessler, D. C., & Lee, S. (2008). Suicide and suicidal behavior. *Epidemiologic Reviews, 30*, 133-154.
- Nock, M. K., Greif Green, J., Hwang, I., McLaughlin, K. A., Sampson, N. A., Zavslasky, A. M., & Kessler, R. C. (2013). Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents. *JAMA Psychiatry, 70*, 300–310.
- Nock, M. K., Hwang, I., Sampson, N. A., & Kessler, R. C. (2010). Mental disorders, comorbidity and suicidal behavior: results from the National Comorbidity Survey Replication. *Molecular Psychiatry, 15*(8), 868-876.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science, 3*, 400-424.
- O'Connor, R. C., & Cassidy, C. (2007). Predicting hopelessness: The interaction between optimism/pessimism and specific future expectancies. *Cognition and Emotion, 21*, 596-613.

- O'Connor, R. C., Connery, H., & Cheyne, W. M. (2000). Hopelessness: The role of depression, future-directed thinking, and cognitive vulnerability. *Psychology, Health, & Medicine*, 5, 155-161.
- O'Connor, R. C., Fraser, L., Whyte, M. C., MacHale, S., & Masterton, G. (2008). A comparison of specific positive future expectancies and global hopelessness as predictors of suicidal ideation in a prospective study of repeat self-harmers. *Journal of Affective Disorders*, 110, 207-214.
- O'Connor, R. C., O'Connor, D. B., O'Connor, S. M., Smallwood, J., & Miles, J. (2004). Hopelessness, stress, and perfectionism: The moderating effects of future thinking. *Cognition and Emotion*, 18(8), 1099-1120.
- Pérez Rodriguez, S., Marco Salvador, J. H., & García-Alandete, J. (2017). The role of hopelessness and meaning in life in a clinical sample with non-suicidal self-injury and suicide attempts. *Psicothema*, 29, 323-328.
- Piscopo, K., Lipari, R. N., Cooney, J., & Glasheen, C. (2016). *Suicidal thoughts and behavior among adults: Results from the 2015 National Survey on Drug Use and Health*. NSDUH Data Review. Retrieved from <http://www.samhsa.gov/data/>.
- Prinstein, M. J., Nock, M. K., Simon, V., Aikins, J. W., Cheah, C. S., & Spirito, A. (2008). Longitudinal trajectories and predictors of adolescent suicidal ideation and attempts following inpatient hospitalization. *Journal of Consulting and Clinical Psychology*, 76, 92-103.
- Rappaport, L. M., Flint, J., & Kendler, K. S. (2017). Clarifying the role of neuroticism in suicidal ideation and suicide attempt among women with major depressive disorder. *Psychological Medicine*, 47, 2334-2344.

Rasmussen, S. A., Fraser, L., Gotz, M., MacHale, S., Mackie, R., Masterton, G., ...O'Connor, R.

C. (2010). Elaborating the cry of pain model of suicidality: Testing a psychological model in a sample of first-time and repeat self-harm patients. *British Journal of Clinical Psychology, 49*, 15-30.

Roepke, A. M., & Seligman, M. E. P. (2016). Depression and prospection. *British Journal of Clinical Psychology, 55*, 23-48.

Sargalska, J., Miranda, R., & Marroquin, B. (2011). Being certain about an absence of the positive: Specificity in relation to hopelessness and suicidal ideation. *International Journal of Cognitive Therapy, 4*, 104-116.

Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. E. (2000). NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): Description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry, 39*, 28-38.

Shaffer, D., Restifo, K., Garfinkle, R., Gould, M., & Lucas, C. (1998). One- and two-stage screens as long-term predictors of mood disorders and suicidality. Poster presented at the Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Anaheim, CA, October.

Smith, J. M., Alloy, L. B., & Abramson, L. Y. (2006). Cognitive vulnerability to depression, rumination, hopelessness, and suicidal ideation: Multiple pathways to self-injurious thinking. *Suicide and Life-Threatening Behavior, 36*, 443-454.

Steed, L. (2001). Further validity and reliability evidence for Beck Hopelessness Scale scores in a nonclinical sample. *Educational and Psychological Measurement, 61*, 303-316.

- Storch, E. A., Roberti, J. W., & Roth, D. A. (2004). Factor structure, concurrent validity, and internal consistency of the Beck Depression Inventory – Second Edition in a sample of college students. *Depression and Anxiety, 19*, 187-189.
- Watson, D., Clark, L. A., & Carey, G. (1988). Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology, 97*, 346-353.
- Whisman, M. A., Perez, J. E., & Ramel, W. (2000). Factor structure of the Beck Depression Inventory - Second Edition (BDI-II) in a student sample. *Journal of Clinical Psychology, 56*, 545-551.
- Williams, J. M. G. (2001). *The Cry of Pain*. London: Penguin.

Table 1. *Correlation Matrix for Clinical Predictors of T4 SI*

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. BSS4	---												
2. BHS1	.30**	---											
3. BHS3	.27**	.61**	---										
4. BDI1	.34**	.69**	.49**	---									
5. BDI3	.36**	.51**	.72**	.63**	---								
6. CtAP1	.12*	.40**	.33**	.44**	.34**	---							
7. CtAP2	.21**	.26**	.35**	.28**	.36**	.40**	---						
8. CtAP3	.26**	.38**	.48**	.35**	.44**	.50**	.73**	---					
9. CtN1	.10	.45**	.31**	.49**	.37**	.54**	.24**	.31**	---				
10. CtN2	.12*	.33**	.33**	.37**	.40**	.33**	.49**	.40**	.56**	---			
11. CtN3	.09	.27**	.39**	.31**	.44**	.24**	.26**	.41**	.56**	.59**	---		
12. PFEF1	-.07	-.21**	-.20**	-.16**	-.14*	-.20**	-.12*	-.19**	.03	-.04	.01	---	
13. PFEF2	.01	-.16**	-.12*	-.07	-.03	-.12*	-.03	-.08	.01	-.03	-.03	.56**	---
14. PFEF3	-.06	-.23**	-.22**	-.14*	-.08	-.18**	-.15**	-.17**	-.01	-.10	-.10	.48**	.67**

*Notes:* BSS = Beck Scale for Suicide Ideation; BHS = Beck Hopelessness Scale; BDI = Beck Depression Inventory; CtAP - Certainty about the Absence of Positive Future Events; CtN = Certainty about the Presence of Negative Future Events; PFEF = Positive Future-Event Fluency; \*  $p < .05$ ; \*\*  $p < .01$  (two-tailed)

Table 2.

*Hierarchical Regression Analysis of T1 Depressive Symptoms and T1 Certainty-AP on T4 Suicidal Ideation*

<i>T1 Predictor</i>	<i>Step 1</i>			<i>Step 2</i>		
	<i>b</i>	<i>SE</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>p</i>
Depressive Sxs	.08	.01	.00	.08	.01	.00
Certainty-AP				-.10	.16	n.s.

Table 3.

*Hierarchical Regression Analysis of T1 Hopelessness and T1 Certainty-AP on T4 Suicidal Ideation*

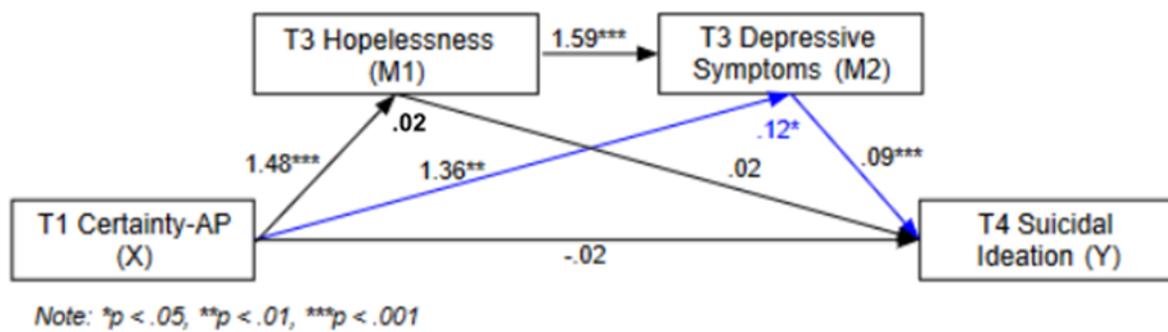
<i>T1 Predictor</i>	<i>Step 1</i>			<i>Step 2</i>		
	<i>b</i>	<i>SE</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>p</i>
Hopelessness	.16	.03	.00	.16	.03	.00
Certainty-AP				.01	.15	n.s.

Figure 1.

*Serial Mediation Model with T1 Certainty-AP as a Predictor of T4 SI*

Total Effect: T1 Certainty-AP → T4 SI (at 18-month follow-up)

$$b = 0.31, SE = 0.15, p < .05$$



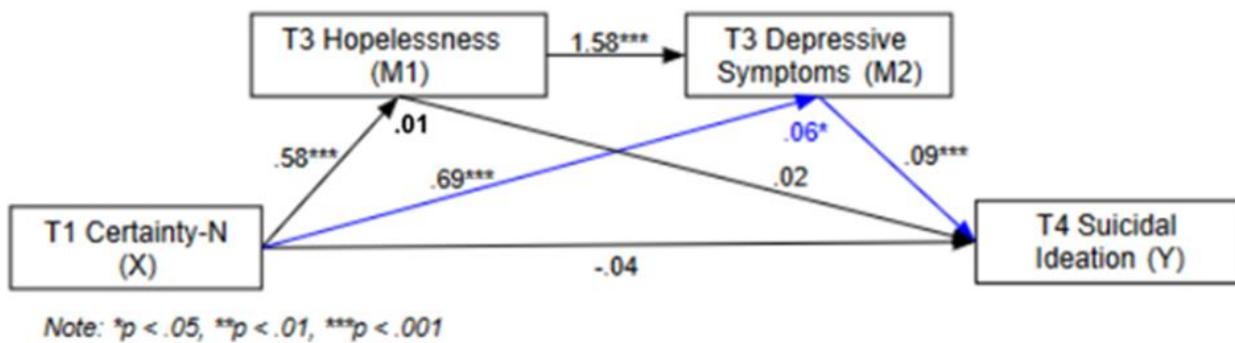
$$\text{Indirect Effect: } X \rightarrow M1 \rightarrow M2 \rightarrow Y = 0.21^*$$

Figure 2.

*Serial Mediation Model with T1 Certainty-N as a Predictor of T4 SI*

Total Effect: T1 Certainty-N → T4 SI (at 18-month follow-up)

$$b = 0.11, SE = 0.07, p < .05$$



$$\text{Indirect Effect: } X \rightarrow M1 \rightarrow M2 \rightarrow Y = 0.08^*$$