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Attentional bias and the Suicide Status Form: Behavioral perseveration of written responses*

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ABSTRACT

Given the vast public health problem of suicide, the need for more effective assessment of suicidal risk is clear. The major approaches applied to this challenge include various direct approaches (e.g., suicide-focused interviews) and indirect approaches (e.g., implicit methodologies or "occult" assessments) that tend to assess an attentional bias for suicidal risk, the latter of which the present investigation sought to study. Using the Suicide Status Form (SSF)—the central multi-purpose tool that is used within a collaborative assessment process with suicidal patients who are engaged in the "Collaborative Assessment and Management of Suicidality" (CAMS; Jobes, 2016)—we aimed to investigate the influence of perseverative, hand-written content responses pertaining to potential suicidal risk. Specifically, we explored whether repeating certain topic content might reflect a perseverative response style; we thus compared written content results of first session SSFs taken from a sample of suicidal U.S. Army Soldiers (Study 1) and a sample of suicidal college students (Study 2). Across the two studies, patients who repeated the same content (*"1-Topic Repeaters"*) had significantly higher ratings related to suicidal ideation in comparison to those with more heterogeneous response styles. This replicated finding perhaps reveals a form of *behavioral perseveration* that is potentially related to increased suicidal risk with possible implications for successful treatment.

1. Introduction

As the 10th leading cause of death in the United States (Centers for Disease Control [CDC], 2018) rates of suicide have steadily increased since 1999, leading to over one million deaths worldwide (CDC, 2015). Despite the obvious need to clinically address this major public health issue, our current understanding for effectively identifying, assessing, and fully understanding suicidal risk is not as evolved as we would otherwise wish. Indeed, Franklin et al., 's 2016 meta-analysis on the last 50 years of research of suicide risk factors makes clear that our ability to effectively assess prospective risk amounts to flipping a coin. With such dismal prospects of effectively assessing suicidal ideation specifically, as well as overall suicidal risk more broadly, the potential for providing effective clinical treatment may be impacted.

2. Suicide risk assessment approaches

While recent critiques of suicide risk assessment have been formidable (e.g., Carter et al., 2017), there are nevertheless various thoughtful efforts underway to better assess suicidal risk in patients that are worth reviewing herein. As discussed by Jobes (2016), these approaches can be organized into two broad domains: *direct* and *indirect* clinical assessments of suicidal risk.

2.1. Direct suicide risk assessment

By direct assessment we mean those approaches that forthrightly query about whether a patient is suicidal. Within this broad domain there are two primary traditions: interview assessment and various suicide screens and assessment tools.

2.1.1. Interview assessment

Previous research has long established that clinicians who assess suicide risk prefer an interview-based assessment approach, asking certain suicide related questions and making behavioral observations (Jobes, Eyman, & Yufit, 1995). Interestingly, these researchers found

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that providers across disciplines were very confident in their own clinical "gut" judgments. This confidence may perhaps be unfounded when one considers the distinct limitations of clinical judgment when compared to actuarial assessments (Dawes, Faust, & Meehl, 1989; Meehl, 1997) wherein the use of well-constructed assessment tools consistently proved to be superior to clinicians' judgments. Moreover, there is the ubiquitous challenge of "secondary gain" or the "instrumental" aspects of suicidality, in that patients who are not actually suicidal may insist that they are for various reasons (e.g., to gain shelter or care). There is the related challenge of face validity of this approach, which may make a genuinely suicidal person deny that they are suicidal for other reasons (e.g., fear of being hospitalized). Fortunately, there is innovative work being done in the interview assessment approach that is meant to maximize the value of direct interviewing while minimizing the challenges, such as the work of the "Aeschi Group" (Michel & Jobes, 2010).

2.1.2. Screens and assessment tools

The Joint Commission, which accredits health care settings in the United States, has pushed for institutions to develop a reliable way of identifying suicide risk, as these deaths have long been a leading "sentinel event" in U.S. healthcare facilities (Mills et al., 2010; The Joint Commission, 2016). To this end, health care settings uniformly want a short, user-friendly, psychometrically valid/reliable, and non-proprietary suicide screening tool with high sensitivity and specificity for predicting future suicides. Unfortunately, no such tool exists. As discussed in depth by Jobes (2016), there are a number of potential symptom-based screening tools that are available but are not necessarily widely used. Examples of these general tools include: the SCL-90/Brief Symptom Inventory (Derogatis, Rickels, & Rock, 1976; Derogatis & Savitz, 1999; Tarescavage & Ben-Porath, 2014), the Behavioral Health Measure (BHM; Bryan et al., 2014; Bryan, Corso, Rudd, & Cordero, 2008; Kopta & Lowry, 2002; Kopta et al., 2014), and the Outcome Questionnaire-45.2 (Lambert, Burlingame, et al., 1996; Lambert, Hansen, et al., 1996). Perhaps the most widely used screener is the Patient Health Questionnaire (PHQ-9), which was designed for depression screening but has found merit in the identification of suicidal risk (Simon et al., 2013). Two additional suicide-specific screeners are the ASQ for youth suicidal risk (Horowitz et al., 2012) and an adult screener that is currently being psychometrically tested called AsQ'em (Horowitz et al., 2013).

It is far beyond the scope of the present article to highlight the plethora of suicide-specific assessment tools that have been developed and published in the professional literature. A few excellent examples include the Scale for Suicide Ideation (Beck, Brown, & Steer, 1997; Beck, Steer, Beck, & Newman, 1993), the Beck Hopelessness Scale (Beck & Steer, 1988), and the Reasons for Living Inventory (Linehan, Goodstein, Nielsen, & Chiles, 1983). One of the most widely used in clinical practice is the Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011). While a bit dated, reviews by Brown (2001) of adult scales and Goldston (2003) for youth-oriented scales are both excellent. It should be noted that, similar to assessment interviews, the obvious face validity of directly asking about suicide revisits the aforementioned challenges of secondary gain and instrumental responses that may compromise the validity of the assessment in terms of who is "genuinely" suicidal.

2.2. Indirect assessment: implicit risk/attentional bias

Given the validity issues of direct assessments, there has been a keen interest in indirect assessment approaches for suicidal risk. These methodologies are sometimes referred to as "occult" assessment (e.g., Claassen & Larkin, 2005), wherein suicide risk is evaluated in a reliable and valid manner without the patient necessarily knowing that their suicidal risk is being assessed. Examples of this approach include the use of the Kessler K-10, which is a brief 10-item symptom checklist with no specific question about suicidal risk. O'Connor and colleagues (O'Connor, Beebe, Lineberry, Jobes, & Conrad, 2012) conducted a study in which K-10 responses with suicidal inpatients were highly correlated with psychometrically sound measures of suicidal risk, effectively discriminating suicidal patients from non-suicidal patients.

Other approaches have used new and adapted technologies to measure autonomic nervous system sensitivity providing suicide-relevant data. For example, Goodman has developed an eye-blink/startle response paradigm (2012; 2015) while others have developed the use of thermal imagery technology that measure the opening of sweat pores (i.e., a physiological autonomic response) related to key trigger questions (Familoni et al., 2012). Importantly, Nock and colleagues (Nock et al., 2010) have created innovative ways of thinking about implicit suicidal risk assessment with their novel use of the "Implicit Association Test" (IAT), and the modified use of the classic Stroop Test related to suicidality (Williams & Broadbent, 1986). These investigators have thus developed an "objective" or "behavioral" assessments of *prospective* suicide attempts by revealing an attentional bias towards suicide-related stimuli. In their seminal 2010 study, Nock et al. measured implicit associations about death/suicide in 157 emergency department patients and the IAT showed a statistically significant six-fold increase for prospective suicide attempts in the six months following the assessment. These data have been further replicated in other studies (Glashouwer et al., 2010; Harrison, Stritzke, Fay, Ellison, & Hudaib, 2014; Randall, Rowe, Dong, Nock, & Colman, 2013; Tang, Wu, & Miao, 2013) and this work has opened a new door to thinking about attentional biases for suicidal risk. Glenn et al. (2017) have extended this line of research by examining whether the predictive utility of the IAT varies by treatment length among a sample of 276 adolescents participating in a residential treatment program. These authors found that, for those whose length of stay was longer than 13 days, implicit identification with death at hospital admission significantly predicted the severity of suicidal ideation at discharge over and above explicit self-reported suicide ideation (Glenn et al., 2017).

3. CAMS and the Suicide Status Form

The Collaborative Assessment and Management of Suicidality (CAMS) is one of a handful of suicide-specific clinical interventions proven to be effective for treating suicidality in replicated randomized controlled trials conducted with a range of suicidal patients in different treatment settings (Andreasson et al., 2016; Comtois et al., 2011; Huh et al., 2018; Jobes et al., 2017; Ryberg, Zahl, Diep, Landro, & Fosse, 2018). Central to the use of CAMS is the "Suicide Status Form" (SSF), which is a multi-purpose assessment, treatment-planning, tracking, and clinical outcome tool that functions as the "road map" guiding the CAMS therapeutic process. CAMS is a therapeutic framework that is designed to create a strong alliance and increase motivation within the patient as the intervention specifically targets and treats patient-defined "suicidal drivers," which are the problems that cause and sustain an individual's suicidality (Jobes, 2016).

In terms of CAMS-based assessment, the SSF "Core Assessment" (i.e., ratings of psychological pain, stress, agitation, hopelessness, self-hate, and overall behavioral risk of suicide) is introduced early on in the first session of CAMS and revisited in all interim CAMS sessions on through the final outcome/disposition session of CAMS. The SSF Core Assessment has proven validity and reliability with inpatient and outpatient suicidal samples (Conrad et al., 2009; Jobes, Jacoby, Cimbolic, & Hustead, 1997). Moreover, meta-analytic data has shown that the CAMS-based assessment process using the SSF functions as a *therapeutic assessment* (Poston & Hanson, 2010).

For the purposes of the present investigation, we will be focusing on the first session version of the SSF, which includes both the SSF Core Assessment and various qualitative prompts for the patient to write-out in their own hand different responses to certain prompts. Patients in the first session of CAMS are asked to write in their own words descriptive

responses for each of the SSF Core Assessment constructs. For example, "What I find most painful is: _____" or "I am most hopeless about: _____" (refer to Jobes et al., 2004). There is further opportunity to write out in their own words up to five "reasons for living" and five "reasons for dying" (Jobes & Mann, 1999). There is a final opportunity to write out a response to: "The one thing that would help me no longer feel suicidal would be: _____" (Jobes, 2016).

As summarized elsewhere (Jobes, 2012), many studies have been undertaken by our research team to understand the qualitative written responses obtained on the first session SSF. These studies include both "micro-coding" of individual response to the SSF prompts (e.g., Jobes et al., 2004) as well as "macro-coding" of the gestalt of first page SSF qualitative responses (Jennings, 2015). We have also used software programming to successfully study SSF written content responses (Brancu, Jobes, Wagner, Greene, & Fratto, 2015) and there have been various "word-count" studies as well (Corona, Ellis, & Jobes, 2019, in press).

4. Perseveration and the present investigation

The present investigation uses a reliable micro-coding approach to SSF responses in order to study a phenomenon that we have observed both in clinical practice as well as within our SSF-based/CAMS clinical trial research. Specifically, we have been aware that there are some suicidal patients who respond to the first session SSF qualitative prompts with a variety of heterogeneous written responses (e.g., issues with relationships, vocation, chronic pain, self-esteem, trauma, and unemployment—refer to Appendix A). In marked contrast, we have observed certain other patients who tend to have much more homogeneous written responses to the same SSF qualitative prompts (e.g., my boyfriend dumped me, losing my boyfriend, being alone, blowing my relationship, missing my boyfriend—refer to Appendix B). In this latter case, we wondered if these written SSF responses about the patient's preoccupation with her boyfriend may perhaps demonstrate a perseverative thought process reflecting a potential version of suicidal rumination that we know from other research can be particularly pernicious for suicidal patients (e.g., Miranda & Nolen-Hoeksema, 2007).

Understanding the role that repetitive and perseverative thought plays in suicidal risk is particularly important as it has been found to be related to other phenomena involved in suicidal suffering, such as depression (Nolen-Hoeksema, 1991), emotion regulation (Miranda, Tsypes, Gallagher, & Rajappa, 2013a), entrapment (Teismann & Forkmann, 2017), cognitive inflexibility (Miranda, Valderrama, Tsypes, Gadol, & Gallagher, 2013b), and insomnia (e.g., Carney, Harris, Moss, & Edinger, 2010). According to the response style theory (Nolen-Hoeksema, 1991), the process of repetitively focusing on the factors that have contributed to one's distress is posited to contribute to the both the duration and severity of depressive responses to negative life events.

Ruminative responding may also prevent the ability to access emotion regulation strategies (Miranda et al., 2013a) and engage in more adaptive, non-suicidal coping responses—including activating, functional behaviors which would allow for positive reinforcement (Nolen-Hoeksema, 1991)—effectively keeping one in a continual state of entrapment between their current state and their goal state (Watkins & Nolen-Hoeksema, 2014). Consequently, the inability to emotionally regulate and reach a goal state may lead to hopelessness and the idea of suicide as a solution to one's problems. Indeed, previous research has found that perceptions of entrapment (Teismann & Forkmann, 2017), as well as an absence of optimism and hope (Tucker et al., 2013) intensify the link between rumination and increased suicidal thinking. Moreover, in the context of rumination and brooding, the perceived inability to adjust approaches in light of environmental feedback (i.e., cognitive inflexibility; Miranda et al., 2013b) and to access emotion regulation strategies (Miranda et al., 2013a) has been found to prospectively predict suicidal ideation. Finally, repetitive thought has been found to perpetuate insomnia (e.g., Carney et al., 2010), and insomnia has garnered increased attention recently as an important risk factor for suicidal ideation (Richardson et al., 2017), attempts (Lin et al., 2018), and deaths (Bjørngaard, Bjerkeset, Romundstad, & Gunnell, 2011).

As described above, previous research has demonstrated the benefits of indirect assessments for suicidal risk, and has also shown that perseverative thought processes are associated with a host of other factors that are clinically relevant for effectively assessing and treating suicidality. Therefore, we endeavored to examine whether written responses by patients within the first session of CAMS on the SSF could be used as a *behavioral assessment* of a perseverative form of suicidal thinking that reveals a potential attentional bias for suicidal risk with implications for clinical assessment and successful treatment. To this end, we will present data from two studies of different suicidal samples investigating the first session SSF responses with an eye to studying patterns of preservative content responses on the SSF.

5. Study 1—Method

The initial study was obtained from a randomized controlled trial (RCT) of CAMS vs. Enhanced Care as Usual (E-CAU) of suicidal active duty U.S. Army Soldiers (Huh et al., 2018; Jobes et al., 2017). This is thus a secondary analysis taken from the experimental arm of this RCT called the "Operation Worth Living" (OWL) study.

5.1. Participants

The sample was 73 suicidal Soldiers. Patients were eligible for participation if they spoke English, were at least 18 years of age, and had significant suicide ideation as defined as an index score of 13 or higher on the Scale for Suicidal Ideation-Current (SSI–C; Beck et al., 1997). Patients were not eligible for participation if they were unable to understand, consent, and (or) benefit from the study procedures, had a judicial order to treatment, or had a separation, change of station, or deployment expected in the next 12 weeks (Jobes et al., 2017). Patients were predominantly Caucasian (51.4%) and male (76.7%), ranging in age from 18 to 58 years [M = 26.8, SD = 5.9]. About half of the patients were married (49.3%) with some college, associate degree, or technical training (46.5%). Junior enlisted (E1-E4) patients consisted of 69.9% of the sample.

5.2. Measures

5.2.1. The Suicide Status Form (SSF-IV-R; Jobes, 2016)

As previously described, the first session version of the SSF uses both quantitative and qualitative assessment prompts to help guide CAMS care (refer to Appendix A). For the purpose of the present study, we used the patients' qualitative responses from the following SSF sections: the SSF "Core Assessment" (i.e., patients' descriptions of psychological pain, stress, agitation, hopelessness, and self-hate), patients' reasons for living and dying, and the one thing patients identified that would help them no longer feel suicidal. Prior studies have established the SSF Core Assessment's validity and reliability with suicidal inpatients and college students (Conrad et al., 2009; Jobes et al., 1997).

5.2.2. Beck's Scale for Suicide Ideation- current (SSI–C; Beck et al., 1997)

The SSI–C is an interviewer-administered scale that assesses suicide ideation at its worst point in the past two weeks. This scale has strong validity and reliability in assessing suicide ideation with psychiatric patients (Chronbach's alpha = .89; Beck et al., 1997; Beck, Kovacs, & Weissman, 1979).

5.3. Analytic approach

To code patients' SSF qualitative responses, we followed Hruschka and colleagues' (2004) procedure for codebook development and

Table 1
Coding categories, descriptions, and examples.

	Description	Examples
Self	References to enduring traits, core attributes, harsh self-critiques, or external descriptors about the self. Also includes references to worthlessness, self-doubt, expectations, and physical appearance.	"I am a failure" "The way I am" "My weight"
Relational Problem	References to specific relationships with children, spouse, partner, friends, significant others, pets or any other social interaction. Includes any response that speaks to being hurt by/hurting others, alone or isolated, burdening/unburdening others.	"Dealing with my divorce" "My unit is watching me too hard" "That I don't fit in"
Unpleasant Internal States	References related to psychiatric or psychological disorders, emotional pain, distress, suffering, shame, painful memories, or other negative emotions. Also includes explicit or implied statements regarding feeling out of control, lost, or unable to change things, constricted thinking and/or a lack of options.	"End the pain" "Flashbacks of the hostile situation" "Can't control my thoughts"
Future	References to broad statements about the future, including general statements about one's ability to cope, function, or achieve in the future.	"The future" "No future worth living for" "Future events"
Role/Responsibilities	References to responsibilities or obligations related to common adult role expectations, including the role of worker, homemaker, or student. Includes specific examples of a role or responsibility or may be an expression of feeling insufficient in these roles.	"Providing for my family" "Work" "Academics"
Physical Health	References to issues with physical pain, or medical (other than psychiatric) problems.	"My physical health" "Injured hand" "Unbearable physical pain"
Global/General	References to nonspecific, broad statements that are completely inconclusive and therefore vague. These responses indicate a general, all-encompassing, or overarching sense of being overwhelmed	"Just life as a whole" "Everything" "Life sucks"
Other	If a statement truly does not fall into another category.	"God's wrath"

implementation. First, a preliminary coding system was developed based on a review of all responses. The coding system involved a "micro-coding" approach that allowed coders to identify the frequency and type of 124 written responses that suicidal Soldiers provided to the SSF prompts. A total of eight distinct content response types emerged from the coding, responses that were focused on: (1) *Self*, (2) *Relational Problems*, (3) *Unpleasant Internal States*, (4) *Future*, (5) *Role/Responsibilities*, (6) *Physical Health*, (7) *Global/General*, and (8) *Other* (refer to Table 1). The *Self*-content category included descriptions of enduring traits, qualities, core attributes, harsh self-critiques, or external descriptors about the self (e.g., "I am a failure," "my difficult personality"). The *Relational Problem* content category included references to specific relationship issues, being hurt by others, responsibility toward others, burdening or unburdening others, as well references to loneliness or a lack of connection with others (e.g., "my boyfriend," "I don't fit in"). The *Unpleasant Internal States* content category included statements regarding psychiatric disorders, emotional pain, suffering, distress, or other negative emotions, as well as references to shame and painful memories, including fixations on the past (e.g., "my depression," "unhappy," "my miserable past"). The *Future* content category included broad statements about the future or about one's ability to cope, function, or achieve in the future (e.g., "what lies ahead"). The *Role/Responsibility* content category included references to responsibilities or obligations related to common adult role expectations including the role of worker, homemaker, or student, as well as concerns related to academics, finances, or career (e.g., "my grades," "tuition payments," "work"). The *Physical Health* content category type included references to physical pain or non-psychiatric medical problems (e.g., "knee pain," "kidney disease"). The *Global/General* content category included nonspecific, broad statements that were completely inconclusive and therefore totally vague, but often indicated a general, all-encompassing, or overarching sense of being overwhelmed (e.g., "life," "everything," "the world in general"). The *Other* category type was used sparingly if statements did not clearly fall into any of the above content categories.

Two graduate student coders then independently coded a random selection of responses and compared their level of agreement. Revisions to the codebook occurred in the case of disagreement and a second random selection was re-coded. This procedure was repeated until coding agreement reached acceptable levels. Independent coding of total coded categories for 50% of the dataset revealed high inter-rater reliability ($\kappa = 0.806$); the graduate student coders then reconciled any disagreements within their data coding.

Having established our reliable coding methodology, we needed to empirically identify potential subgroupings of responses. We chose to identify subgroups because the distribution of our independent variable was skewed and had multiple modes. The methodological recommendations of Fletcher and Satz (1985) posit that this type of multimodal distribution may be consistent with the presence of subgroups in a sample. We chose to find naturally occurring clusters in our sample of responders using a hierarchical cluster analysis (Donoghue, 1994). Using the Statistical Package for the Social Sciences (SPSS) Version 21, we ran a hierarchal cluster analysis using a Euclidean distance metric. A bottom-up agglomerative hierarchical cluster analysis was done, where each observation is a cluster that is then recursively combined. From the cluster analysis, we identified four distinct group clusters that functioned as a quasi-independent variable. The four groups include: 1)*"1-Topic Repeater"* (i.e., those patients who repeated any one coded topic category—e.g., a patient who repeatedly refers to her spouse six times on the SSF, thus falling under the coding category of *Relational Problems*); 2) *"2-Topic Repeater"* (i.e., those patients who repeated any two coded topic categories—e.g., a patient who repeatedly refers to her spouse six times and four references to her own self-hatred, thus falling under the coding categories of *Relational Problems* and *Self*); 3) *"3 + Topic Repeater"* (i.e., those who repeated three or more coded topic categories—e.g., six references to spouse, four references to self-hatred, and four references to the future, thus falling under the coding categories of *Relational Problems, Self,* and *Future*); and 4) *"Non-Repeater"* (i.e., patients who did not repeat any specific topic in their SSF written responses).

An analysis of variance (ANOVA) was performed using these four groups to compare baseline Scale for Suicidal Ideation-Current (SSI–C) scores. Next, as an exploratory study, we performed a linear regression on the three repeaters groups (*1-*, *2-*, and *3 + Topic Repeaters*) to see if the total number of coded content topics was related to SSI–C baseline scores (i.e., do SSI–C scores increase as the number of content types decrease?). Lastly, we performed a linear regression analysis to see if the *total number of times* a specific content area was repeated was related to SSI–C scores.

Table 2
Analysis of variance for Study 1 measures in the four groups.

Scale	Subgroup	Mean	SD	F	P
SSI–C	Non-Repeater	15.75	3.10	4.33	.007
	1-Topic Repeater	23.75	6.17		
	2-Topic Repeater	20.61	5.09		
	3 + Topic Repeater	17.56	4.97		

Note: SSI–C = Scale for Suicide Ideation- Current; SD = standard deviation. For the SSI–C, higher scores indicate greater levels of suicidal ideation.

6. Study 1—Results

Of the 124 coded responses, the leading content topic responses were: 1) *Relational Problems* (33.7%), 2) *Role-Responsibility* (26.5%), 3) *Self* (19.1%), 4) *Unpleasant Internal States* (11.8%), 5) *Global/General* (4.1%), 6) *Future* (2.4%), 7) *Physical Health* (1.3%), and 8) *Other* (1.1%).

The one-way ANOVA revealed significant differences between the four groups in terms of their baseline SSI–C scores F (3, 72) = 4.32, p = .007. Post-hoc univariate analyses revealed two significant between group differences. First, *1-Topic Repeaters* had significantly higher SSI–C scores at baseline [M = 23.75, SE = 1.78] than *Non-Repeaters* [M = 15.75, SE = 1.55], p = .009. In addition, *1-Topic Repeaters* had significantly higher SSI–C scores at baseline [M = 23.75, SE = 1.78] than *3 + Topic Repeaters* [M = 20.19, SE = 0.65], p = .003 (refer to Table 2).

The linear regression looking at the three groups (*1-, 2-,* and *3 + Topic repeaters*)demonstrated a significant relationship between the total number of coded topic categories and SSI–C scores; specifically, the fewer number of coded topic categories that were repeated, the higher the baseline SSI–C scores, p = .014, $\beta = -0.21$.

The second linear regression analysis did not show a significant relationship between SSI–C scores and the total *number of times* a specific content area was repeated, p = .528. Between our three different subtypes, the descriptive data on the total number of times a specific topic was repeated were as follows: *1-Topic Repeaters* (n = 30) repeated content 2–12 times, M = 6.43, SD = 1.99. There was a negative distribution, meaning that most *1-Topic Repeaters* repeated content responses 7 times. *2-Topic Repeaters* (n = 23) repeated content 4–16 times, M = 10.06, SD = 2.57. There was a negative distribution, meaning that most *2-Topic Repeaters* repeated content responses 13 times. Finally, *3 + Topic Repeaters* (n = 14) repeated content 12–21 times, M = 13, SD = 2.46. There is a positive distribution, meaning that most *3-Topic Repeaters* repeated content responses 14 times. There is no distributional information regarding *Non-Repeaters* (n = 6), since they did not have a total number of times a specific topic was repeated.

7. Study 2—Method

The second study was an archival correlational investigation of a large sample of suicidal college students seen in a university counseling center in the mid-Atlantic region of the United States. The study data were thus drawn from an archive of de-identified counseling center SSFs.

7.1. Participants

The sample consisted of 73 undergraduate and graduate students who were who were randomly selected from a larger sample of suicidal students treated with CAMS (N = 178; refer to Lento, 2015). Patients were eligible for participation if they were monitored via the university counseling center's suicide tracking system. Patients were not eligible for participation if they were under the age of 18 at the time of treatment and data collection. Participants were predominantly Caucasian (40.5%) and male (51.4%), ranging in age from 18 to 33 years [M = 21.6, standard deviation (S.D) = 3.51]. A total of 55 (74.3%) of participants were undergraduate students and 19 (25.7%) were graduate students.

7.2. Measures

7.2.1. The Suicide Status Form (SSF-II-R)

The SSF used in this second study was an earlier iteration of the tool previously described above in Study 1 methods (Jobes, 2006). The data were drawn from the first page of the first session of the SSF (which is identical in content to the version used in the OWL study). Thus, the psychometrics described above applies to this version of the SSF as well.

7.2.2. Behavioral Health Measure-20 (BHM-20)

The BHM is a self-report assessment consisting of 20 questioned designed to track clients' progress in treatment and treatment outcomes (Kopta et al., 2014; Kopta & Lowry, 2002). Two items were selected from patients' initial BHM assessments for the purpose of the present study. The first item, BHM #10, pertains to the frequency of suicidal ideation and asks, "In the past two weeks or since your last appointment, how much have you been distressed by thoughts of ending your life?" Lower scores indicate greater severity, with possible responses ranging from 0 (*"almost always"*) to 4 (*"never"*). The second item, BHM #21, is only administered if some level of suicidal ideation is endorsed on item #10, and pertains to perceived overall risk of suicide. BHM #21 reads, "If you answered 0–3 on question #10 above, please check below to indicate your overall risk of suicide." For this item, lower scores also indicate greater severity. In Study 2, all patients in the sample completed this item. Possible responses range from 0 (*"extremely high risk"*) to 4 (*"no risk"*). The combination of BHM #10 and BHM #21 (i.e., the Suicide Monitoring Scale [SMS]) was also utilized. Previous research has established the SMS's reliability and validity in college counseling centers (Kopta, Mond, David, Potruzski, & Doll, 2010) and primary care settings (Bryan et al., 2008).

7.3. Analytic approach

In Study 2 we coded 368 written responses from 73 suicidal college students who completed the first session SSF. Using the same methodology as Study 1, a high degree of inter-rater reliability was achieved using the same coding system (κ = 0.866) and all disagreements were resolved through reconciliation of the graduate student coders.

From the Study 2 cluster analysis, four group clusters were again identified to use as a quasi-independent variable, yielding the same response types—1) *"1-Topic Repeater;"* 2) *"2-Topic Repeater;"* 3) *"3 + Topic Repeater;"* and 4) *"Non-Repeater."* As in Study 1, an initial analysis of variance (ANOVA) was performed using these groups to compare baseline BHM item #10, item #21 ratings and overall SMS score. Following Study 1 methodology, we performed a linear regression on the three repeater categories (all but the Non-Repeaters) to see if the total number of coded content topics was related to the three dependent variables used in Study 2. Lastly, we performed a second linear regression analysis to see if the total number of times a specific content area was repeated was related to the three dependent variables of interest.

8. Results

Of the 368 coded responses, the leading content topics were: 1) *Relational Problems* (28.9%), 2) *Unpleasant Internal States* (18.2%), 3) *Role/Responsibility* (15.7%), 4) *Self* (14%), 5) *Future* (9.9%), 6) *Global/General* (9.1%), 7) *Other* (2.5%), and 8) *Physical Health* (1.7%).

Three one-way ANOVAs were conducted to compare the number of coding categories used (i.e., *1-Topic Repeaters, 2-Topic Repeaters, 3 + Topic Repeaters, and Non-Repeaters*) on BHM #10, BHM #21, and SMS scores. There was a significant overall ANOVA for number of coding categories used and BHM #10 scores, F (3, 57) = 8.24,

Table 3
Analysis of variance for Study 2 measures in the four groups.

Scale	Subgroup	Mean	SD	F	P
BHM-20 #10	Non-Repeater	2.00	0.00	8.24	< .001
	1-Topic Repeater	0.96	0.86		
	2-Topic Repeater	2.21	0.92		
	3 + Topic Repeater	2.08	1.12		
BHM-20 #21	Non-Repeater	1.20	1.10	11.21	< .001
	1-Topic Repeater	3.04	0.88		
	2-Topic Repeater	2.53	0.83		
	3 + Topic Repeater	1.50	0.90		
SMS	Non-Repeater	1.20	0.45	1.18	.327
	1-Topic Repeater	2.64	1.00		
	2-Topic Repeater	2.05	1.27		
	3 + Topic Repeater	2.08	0.74		

Note: BHM-20 = Behavioral Health Measure-20; SMS = Suicide Monitoring Scale; SD = standard deviation. For BHM-20 #10 and #21, lower scores indicate greater severity.

$p < .001$. Specifically, *1-Topic Repeaters* reported significantly more frequent suicidal ideation ($M = 0.96$, $SD = 0.86$) in comparison to the other three groups—*Non-Repeaters* ($M = 2.00$, $SD = 0.00$), *2-Topic Repeaters* ($M = 2.21$, $SD = 0.92$), and *3 + Topic Repeaters* ($M = 2.08$, $SD = 1.12$). There was also a significant overall ANOVA for number of coding categories used on BHM # 21 scores, F (3, 51) = 11.21, $p < .001$. Specifically, *1-Topic Repeaters* reported significantly lower overall risk of suicide ($M = 3.04$, $SD = 0.88$) in comparison to two groups—i.e., *Non-Repeaters* ($M = 1.20$, $SD = 1.10$) and *3 + Topic Repeaters* ($M = 1.50$, $SD = 0.90$). Additionally, *2-Topic Repeaters* reported significantly lower overall suicide risk ($M = 2.53$, $SD = 0.83$) in comparison to two groups—*Non-Repeaters* ($M = 1.20$, $SD = 1.10$) and *3 + Topic Repeaters* ($M = 1.50$, $SD = 0.90$). There was no significant effect for the ANOVA using SMS scores, F (3, 55) = 1.18, $p = .327$ (refer to Table 3).

Linear regression analyses demonstrated a significant relationship between the total number of coding categories used and BHM #10 scores. Specifically, patients with fewer coding categories used had significantly lower BHM #10 scores (indicating higher frequency of suicide ideation), $\beta = -0.001$, $p = .010$. The total number of coding categories used did not predict either BHM #21 ($\beta = 0.000$, $p = .469$) or SMS scores ($\beta = -0.019$, $p = .760$).

The second linear regression analysis did not show a significant relationship between the total number of times a specific content area was repeated and SMS, BHM #10, and BHM #21 scores ($p = .331$, $p = .428$, $p = .171$, respectively).

Between our three different subtypes, the descriptive data on the total number of times a specific topic was repeated were as follows: *1-Topic Repeaters* (n = 30) repeated content 2–13 times, M = 4.07, SD = 2.39. There was a positive skew in this distribution, meaning that most *1-Topic Repeaters* repeated content responses two times. *2-Topic Repeaters* (n = 22) repeated content 4–12 times, M = 5.73, SD = 2.10. There was a positive skew in the distribution, meaning that most *2-Topic Repeaters* repeated content responses four times. Finally, *3 + Topic Repeaters* (n = 14) repeated content 6–13 times, M = 8.57, SD = 2.34. There was also a positive skew in this distribution, meaning that most *3-Topic Repeaters* repeated content responses six times. There is no distributional information regarding *Non-Repeaters* (n = 7), since they did not have a total number of times a specific topic was repeated.

9. Discussion

The present investigation examined written content responses to various Suicide Status Form (SSF) qualitative prompts for suicidal patients in two different clinical trials of CAMS. The investigators had previously observed within ongoing CAMS research that most patients respond to the SSF qualitative prompts with a wide range of content responses—a heterogeneous response style. In contrast, we have also noticed a subset of patients who tend to focus on certain content topics and repeat these same topics two or more times across their written responses on the SSF. In our efforts to better understand the nature of suicidal thinking, we thus investigated whether there was any particular utility to better understanding patients who repeated certain topics. To this end, we developed a rigorous and reliable coding system to investigate different SSF response styles with a particular eye to those patients who repeated the same topics.

In Study 1, we observed that *1-Topic Repeaters*—those who wrote about the same topic (ranging from 2 to 21 times) across the SSF, had significantly higher baseline suicidal ideation in comparison to those with more heterogeneous response styles and the *3 + Topic Repeaters*. Moreover, from a slightly different analytic angle, the regression analysis revealed that the number of coding categories used was significantly related to increased suicidal ideation at baseline; the less coding categories that were used, the higher the suicidal ideation score.

Similarly, in Study 2, we observed that *1-Topic Repeaters* had significantly more frequent thoughts of suicide when compared to the other groups; however, contrary to our hypothesis, we did not see a significant finding for the BHM item of self-reported suicide risk. This perhaps reflects a limitation of BHM single item measures as similar paradoxical findings have been previously seen (Jobes, Kahn-Green, Green & Goeke-Morey, 2009). Nevertheless, the frequency of suicidal thoughts finding used in a regression analysis yielded a similar finding to Study 1, where the fewer number of coding categories used was significantly related to higher ratings of suicidal risk. It is important to note, that across both samples there was no significant relationship between the *number of times* certain content topics were repeated and the suicide-related dependent variables. The variable that stood out in both studies was the heterogeneity of repeated content topics, which we posit to be a unique type of suicidal attentional bias.

Given these related findings across two very different samples, we have perhaps discovered a novel method for revealing a particular kind of suicidal attentional bias. But in marked contrast to physiological and technological methods for revealing a suicidal attention bias (e.g., Familoni et al., 2012; Nock et al., 2010), the current approach may reflect a purely *behavioral* method for uncovering a certain kind of suicidal attentional bias. Specifically, the repetition of the same written content topic on the first session version of the SSF appears to reflect a kind of perseverative suicidal response style that is significantly associated with increased ratings and frequencies of suicidal ideation across two samples of suicidal patients. It is well known in the suicidology literature that preservative or ruminative processes related to suicide may be particularly pernicious (e.g., Surrence, Miranda, Marroquín, & Chan, 2009). It is important to note, however, that most studies of perseveration and rumination employ self-reports of this process, which is one-step removed due to the process of reflecting on the experience and self-reporting that experience based on reflection. In our study, with significant variability across written SSF responses, we see *direct* examples of behavioral perseveration in the form of repeated written responses by these suicidal patients. Before more fully integrating these findings in terms of research and practice, we would like to further consider some key literature that is potentially relevant to the findings of our study.

9.1. Rumination and suicide

Rumination can be defined as the tendency to respond to distress by focusing on the causes and consequences of one's own distress (Nolen-Hoeksema, 1991). The pernicious process of ruminating has clearly been linked to suicidal ideation (Ahrens & Linden, 1996; Fairweather, Anstey, Rodgers, Jorm, & Christensen, 2007; Miranda & Nolen-Hoeksema, 2007) and suicidal behaviors (Grassia & Gibb, 2009; Surrence et al., 2009)—both concurrently and prospectively. In fact, the construct of rumination has garnered so much scientific attention that a

specific type of rumination has been coined by Rogers and Joiner (2017), referred to as "suicide-specific rumination; " this is the mental fixation on one's suicidal thoughts, intentions, and plans, specifically. Furthermore, in a recent meta-analysis of rumination and suicidality, we see common methods for measuring rumination among suicidal individuals (Rogers & Joiner, 2017). These were mostly self-report questionnaires including the Rumination Response Scale (RRS; Nolen-Hoeksema, 1991) and the Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011). A new self-report measure called the Suicide Rumination Scale (SRS; Rogers et al. under review) has also been developed. But the limitations of self-report data are well known; the present data provides a novel and alternative way of studying rumination and suicidality. Future research may benefit from further examining how our novel behavioral assessment of perseverative thought processes reflected in written responses adds to our understanding of increased suicidal ideation. It would also be useful to ascertain whether our developed assessment of behavioral perseveration administered at the start of treatment prospectively predicts relevant treatment outcomes (e.g., suicide attempts) and (or) motivation and engagement in treatment.

9.2. Repetitive negative thinking

From a somewhat different perspective, it has been argued that rumination and other repetitive negative thinking (RNT) patterns are likely trans-diagnostic (Law & Tucker, 2018), and may be especially important in the development and persistence of suicide-related ideation and behaviors. For instance, Wenzel and Beck's (2008) cognitive model of suicidal behavior proposes that such RNT processes may activate more suicide-specific cognitive processes, including attentional biases toward suicide. It has more recently been suggested that in the context of RNT, an individual may develop a sense of hopelessness and entrapment that could bring on suicidal thoughts and eventually suicidal behavior (Law & Tucker, 2018). Notably, as described above, research has found that the relationship between rumination and suicidal ideation is strengthened when individuals lack optimism and hope (Tucker et al., 2013) and perceive high levels of entrapment (Teismann & Forkmann, 2017). Consistent with the 3-Step Theory (Klonsky & May 2015) and Interpersonal Theory of Suicide (Joiner, 2005), Law and Tucker (2018) hypothesize that for individuals suffering from RNT, the transition from suicidal ideation to action may occur through increasing one's capability for suicide due to repeatedly experiencing internal violent imagery and thoughts common to RNT processes. As such, it is clear that rumination is a critical factor when considering a patient's suicidal risk. In the context of the present study, and for clinicians utilizing CAMS, a patient who exhibits hyper-focus on a single response content (e.g., a relationship break-up) should consider targeting this particular issue within prospective CAMS-guided treatment. Indeed within CAMS, *what* suicidal people are actually thinking about is central to successful suicide-specific care (Jobes, 2016).

9.3. Content of suicidal thinking

Even while the primary focus of this two-part study was on behavioral perseveration of written SSF responses, the present effort created an opportunity to further examine the actual content of suicidal thinking within the written words of suicidal patients. Along these lines, Jobes et al. (2004) conducted an early study of SSF qualitative responses written by different samples of suicidal patients (similar to this present investigation using a military and college student samples). This study showed that almost two-thirds of the total 636 SSF responses across a combined sample of 152 suicidal patients were captured by 4 of 12 coding categories. In that study, the top four coding categories where: 1) *Relational* (22%), 2) *Role-Responsibility* (20%), 3) *Self* (15%), and 4) *Unpleasant Internal States* (10%). As noted in this early study, there was surprisingly little written on SSFs about "depression" or "psychosis" (i.e., symptoms/risk factors that dominate the literature); indeed, most responses were focused on love and work. The current two-study investigation creates a similar opportunity to examine the content focus of what samples of suicidal Soldiers and college students wrote on their first session SSF. In contrast to the 2004 study, there was an increased focus on *Unpleasant Internal States* in the present samples, but *Relational Problems* continue to be the primary issue for suicidal people both then and now.

9.4. Implications and limitations

Early on, we emphasized the critical need to enhance our ability to assess risk and the incidence of suicidal ideation given the limitations of existing approaches. Indirect assessments have recently garnered a lot of excitement in their ability to identify suicidal risk in a covert way by revealing an attentional bias towards suicide using different methodologies. The present study was clearly more overt in focus, but even within an obvious suicide risk assessment agenda, there are underlying hidden propensities that may be used to help differentiate risk, in this case using the patient's own written words. This study may thus offer some value for better understanding suicidality, particularly as it may relate to ruminative suicidal processes or RNT patterns. Targeting a particular rumination issue within a suicide-specific treatment may therefore be compelling. Indeed, within the CAMS model of care, such an issue invariably becomes a patient-defined "suicidal driver," which becomes a targeted focus within on-going care (Jobes, 2016; Tucker, Crowley, Davidson, & Gutierrez, 2015).

Certainly, there are some limitations to the present investigation: the sample sizes were limited, we did not examine suicide attempts, and the student sample had an unexpectedly high number of males in comparison to typical counseling center samples. The coding systems are imperfect and while they may capture the breadth of topics, they tend to miss the depth of some the patient responses. We also did not see a consistent pattern of consistent regressions results replicating across the studies. Our reliance on cross-sectional data and single item ratings from the BHM-20 is admittedly less than optimal. There are many well-known issues with self-reported risk and use of single items assessment from a larger tool; our paradoxical findings related to BHM reporting of increased frequency of suicidal thoughts vs. the lack of BHM self-reported risk in Study 2 is problematic. However, the replication of both coding and key research results across two different studies of markedly different suicidal samples should be somewhat reassuring within an unabashedly exploratory effort to discover a whole new *behavioral assessment* that may prove relevant to a particularly pernicious aspect of suicidal thinking (i.e., rumination).

The need for better and more sophisticated assessment of suicidal risk is clear and the present study offers a novel approach that may provide a window into the nature of suicidal ruminations which can become deadly. If we are to realize our shared goal of clinically saving lives, we need numerous and novel methodologies for understanding the suicidal mind to optimally treat our patients and potentially help save these lives from the scourge of suicidal despair.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.brat.2019.04.011.

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Appendix A

Case Example SSF: Suicidal College Student Non-Repeater

CAMS Suicide Status Form-SSF II-R (Initial Session)

Patient: [redacted] Clinician: [redacted] Date: [redacted] Time: [redacted]

Section A (*Patient*):

Rate and fill out each item according to how you feel right now.
Then rank in order of importance 1 to 5 (1=most important to 5=least important).

Rank	
5	1) RATE PSYCHOLOGICAL PAIN (*hurt, anguish, or misery in your mind, not stress, not physical pain*): **Low pain:** 1 2 (3) 4 5 **:High pain** What I find most painful is: Feeling out of control
2	2) RATE STRESS (*your general feeling of being pressured or overwhelmed*): **Low stress:** 1 2 3 (4) 5 **:High stress** What I find most stressful is: school
3	3) RATE AGITATION (*emotional urgency; feeling that you need to take action, not irritation; not annoyance*): **Low agitation:** (1) 2 3 4 5 **:High agitation** I most need to take action when: I'm anxious
1	4) RATE HOPELESSNESS (*your expectation that things will not get better no matter what you do*): **Low hopelessness:** 1 (2) 3 4 5 **:High hopelessness** I am most hopeless about: Life
4	5) RATE SELF-HATE (*your general feeling of disliking yourself, having no self-esteem, having no self-respect*): **Low self-hate:** 1 (2) 3 4 5 **:High self-hate** What I hate most about myself is: I don't want to let the bad emotions go
N/A	6) RATE OVERALL RISK OF SUICIDE: **Extremely low risk: (will not kill self)** (1) 2 3 4 5 **:Extremely high risk (will kill self)**

1) How much is being suicidal related to thoughts and feelings about yourself? **Not at all:** 1 2 3 (4) 5 **: completely**
2) How much is being suicidal related to thoughts and feelings about others? **Not at all:** 1 (2) 3 4 5 **: completely**

Please list your reasons for wanting to live and your reasons for wanting to die. Then rank in order of importance 1 to 5.

Rank	REASONS FOR LIVING	Rank	REASONS FOR DYING
1	Family	1	Feeling like I was going to die anyway
2	Friends	2	Don't want to deal anymore
3	I can get better	3	escape
		4	I'm a burden to others

I wish to live to the following extent: Not at all: 0 1 2 3 (4) 5 6 7 8 : Very much
I wish to die to the following extent: Not at all: 0 1 (2) 3 4 5 6 7 8 : Very much
The one thing that would help me no longer feel suicidal would be: Feeling connected to those around me

Appendix B

Study 2 Case Example SSF: Suicidal Soldier 1-Topic Repeater

CAMS Suicide Status Form-SSF IV (Initial Session)

Patient: [redacted] Clinician: [redacted] Date: [redacted] Time: [redacted]

Section A (*Patient*):

Rate and fill out each item according to how you feel right now.
Then rank in order of importance 1 to 5 (1=most important to 5=least important).

Rank	
5	1) RATE PSYCHOLOGICAL PAIN (*hurt, anguish, or misery in your mind, not stress, not physical pain*): Low pain: 1 2 3 4 (5) :High pain What I find most painful i: My wife of 13 years wants to leave for another man
2	2) RATE STRESS (*your general feeling of being pressured or overwhelmed*): Low stress: 1 2 3 4 (5) :High stress What I find most stressful is: My wife and I can't agree on stuff
4	3) RATE AGITATION (*emotional urgency; feeling that you need to take action; not irritation; not annoyance*): Low agitation: 1 2 3 (4) 5 :High agitation I most need to take action when: When a man knows that woman is married but doesn't care!
3	4) RATE HOPELESSNESS (*your expectation that things will not get better no matter what you do*): Low hopelessness: 1 2 3 4 (5) :High hopelessness I am most hopeless about: Never seeing My wife again
1	5) RATE SELF-HATE (*your general feeling of disliking yourself; having no self-esteem; having no self-respect*): Low self-hate: 1 2 3 (4) 5 :High self-hate What I hate most about myself is: The way I treated My wife in the past
N/A	6) RATE OVERALL RISK OF SUICIDE: Extremely low risk: (will not kill self) 1 2 (3) 4 5 :Extremely high risk (will kill self)

1) How much is being suicidal related to thoughts and feelings about yourself? Not at all: (1) 2 3 4 5 : completely
2) How much is being suicidal related to thoughts and feelings about others? Not at all: 1 2 3 4 (5) : completely

Please list your reasons for wanting to live and your reasons for wanting to die. Then rank in order of importance 1 to 5.

Rank	REASONS FOR LIVING	Rank	REASONS FOR DYING
1	having fun with kids		I've lost My wife
2	I'm retiring in 5 years		I work to hard-I'm tired
3	I have family at home who love me		I messed things with my wife

I wish to live to the following extent: Not at all: 0 1 2 3 4 5 6 7 (8) : Very much
I wish to die to the following extent: Not at all: 0 1 2 3 (4) 5 6 7 8 : Very much

The one thing that would help me no longer feel [redacted] If I could fix my marrige and get my wife back