EXPLORING THE FACTOR STRUCTURE AND CORRELATES FOR CAPABILITY FOR SUICIDE

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By

Taylor Gamble

Director: Dr. David McCord

Professor Emeritus

Psychology Department

Committee Members: Dr. Brianna Byllesby, Psychology

Dr. Alvin Malesky, Psychology

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Root Mean Square Error Approximation (RMSEA)

Abstract

Suicide is the 10th leading cause of death in the United States with approximately 50,000 deaths in 2019 (Centers for Disease Control, *Facts about suicide* 2022). According to the interpersonal-psychological theory of suicide (IPTS; Van Orden et al., 2010), a leading perspective in this area, there are three major constructs that lead an individual to die by suicide: thwarted belongingness, perceived burdensomeness, and capability for suicide. Capability is proposed as a key component in an individual's transition from suicidal ideation to a lethal or near-lethal attempt. The purpose of the current study is to explore the factor structure of capability for suicide, a subconstruct of the IPTS, and to examine its associations with relevant MMPI-3 scales. Our results suggest that there are three factors underlying the latent construct of capability for suicide. Factor one is characterized by self-referential fearlessness about suicide, factor two is characterized by other-referential fearlessness about death and pain perception, and factor three is characterized by fearlessness about suicide. Our factors give evidence that capability is made up of multiple components including predispositional and acquired components. Overall, the study gives evidence that there are different types of fearlessness and that capability is developed in various capacities. Limitations of this study include the different Likert scales making up the measures which resulted in possible clustering due to other reasons besides capability. Future studies should strive to use measures of capability that have the same metrics to ensure that different constructs of capability are clustering rather than measurements.

Keywords: Capability for Suicide, Minnesota Multiphasic Personality Inventory- 3 (MMPI-3), Interpersonal-Psychological Theory of Suicide (IPTS)

Exploring the Factor Structure and Correlates of Capability for Suicide

Suicide is a global issue impacting essentially all populations (Fleischmann & De Leo, 2014). Classification accuracy is important in evaluating suicidality, as the consequences of over-estimating risk can lead to unnecessary allocation of time and professional resources, but under-estimating risk can be catastrophic. McNiel et al. (2008) also found that it was important to have training in empirically-based suicide risk assessment for individuals working with patients that are at risk for suicide (e.g., clinicians, police, nurses, clergy, psychiatrists, physicians, firefighters). There are various systems and methods of screening and assessing for suicide risk, none of which is without psychometric limitations (Eack et al., 2006; Hom et al., 2016). We base our work here on the interpersonal-psychological theory of suicide (IPTS; Van Orden et al., 2010), a theoretically elaborated and strongly empirically supported framework. We will briefly describe the IPTS broadly, followed by a brief description of overall suicide risk assessment. We then focus specifically on the capability for suicide component, including its measurement. The broad goal of the current project is to expand and refine our understanding of this third component of the IPTS.

The Interpersonal Theory of Suicide

Joiner and many colleagues are recognized for developing the interpersonal-psychological theory of suicide (IPTS; see Joiner, 2009; Van Orden et al., 2008), a conceptual framework to describe why people die by suicide, which connects research and theoretical perspectives to clinical practice. The three primary constructs that comprise the IPTS are thwarted belongingness, perceived burdensomeness, and the capability for suicide. Broadly, it posits two predictions about when desire for death and serious or lethal suicidal behavior are likely to occur: (1) serious desire arises from thwarted belongingness and perceived

burdensomeness, as well as hopelessness that the situation will not change (Ribeiro & Joiner, 2009); and (2) for lethal or near-lethal suicidal behavior to occur one must not only have suicidal desire, but also the capability to carry out an attempt (i.e., the capability for suicide; J. Anestis et al., 2018; Joiner, 2005; Van Orden et al., 2010). Thwarted belongingness includes feelings of loneliness and the belief that their life is devoid of reciprocal caring relationships (J. Anestis et al., 2018). One clear finding regarding the importance of belongingness came from Trout (1980), indicating that individuals who die by suicide likely experience social isolation before their deaths. Perceived burdensomeness is an individual's feelings of being a burden on their family and friends and that they may be better off without them. These feelings of being a burden have been found to be strong predictors of suicide in adults (DeCatanzaro, 1995) and youths (Woznica & Shapiro, 1990). Capability for suicide includes dispositional factors, such as disconstraint and impulsivity, acquired factors, such as increased pain tolerance and habituation to death-related stimuli, and practical factors, such as access to lethal means and specific plans and preparation (Klonsky & May, 2015).

Overall Suicide Risk Assessment from the Perspective of the IPTS

Joiner et al. (1999) first described seven domains that are relevant to suicide risk within the IPTS framework, which included previous suicidal behavior, current suicidal ideation, precipitant stressors, general symptoms (e.g., hopelessness), impulsivity and self-control, other predispositions, and protective factors. These domains are assessed by a 17-question clinical interview (some questions containing sub-parts). This systematic approach also includes rating of risk severity and corresponding treatment protocols that should follow. Chu et al. (2015) provided an update to this framework with many of the changes being associated with bridging the gap between research and clinical practice.

Capability for Suicide

The capability for suicide is a key construct in suicide theory and risk assessment. The IPTS proposes that humans are biologically prepared to be frightened of suicide because engaging in suicidal behavior is against our biological drive to survive (Ribeiro et al., 2014). Our natural fear of death is an important protective factor, and when this fear lessens, the risk of suicide increases. Fearlessness about death has been found to be associated with fearlessness about suicide, self-reported courage to attempt suicide, and several outcomes associated with pain perception (e.g., self-perceived ability to withstand physical discomfort, fearlessness of physical pain, and behavioral measures of increased pain tolerance; J, Anestis et al., 2018). This reflects the original focus on experiences that either increase pain tolerance or produce habituation to fearful, death-related stimuli. One major component is the building of an individual's pain tolerance and experiences that cause suicide attempts to become less frightening. Habituation can occur through painful and provocative experiences such as childhood maltreatment, combat exposure, non-suicidal self-injury, and previous suicide attempts, experiences which increase the risk for lethal suicidal behavior because they are sufficiently frightening and physically painful that it builds habituation (M. Anestis et al., 2011; Chu et al., 2015; Van Orden et al., 2010; Whitman et al., 2021). Non-suicidal self-injury (NSSI) is the purposeful destruction of one's body tissues without suicidal intent, but it is a prevalent problem linked to many adverse outcomes such as suicidal ideation, suicide attempts, and death (Rabasco & Andover et al., 2021; Ribeiro et al., 2016; Whitman et al., 2021). Van Orden et al. (2010) found that it is not only lethal or near-lethal suicide attempts that cause habituation to fear and pain tolerance, but also the time it takes to plan an attempt allows the individuals to gain habituation to the fear associated to attempt. Previous suicide attempts are among the most

significant indicators of higher pain tolerance and lethal or near-lethal suicide attempts (J. Anestis et al., 2018). This is supported by Smith et al. (2010) who found that individuals who had attempted suicide generally viewed themselves as more fearless and insensitive to pain compared to suicidal ideators.

"Acquired" capacity/capability is the original term used for this component of the IPTS, but recent research has shown underlying dispositional traits are highly associated with the capability to die by suicide as well. This led to the terminology change, from "acquired capability/capacity" to "capability for suicide." These dispositional (non-acquired) factors have certainly been noted, and Chu et al. (2017) present strong evidence that dispositional traits associated with disconstrained behavior contribute significantly to fearlessness about death and capability for suicide. These traits include boldness, fearlessness in general, impulsivity, and risk-propensity. M. Anestis et al. (2011) suggest that the capability for suicide is what distinguishes the IPTS from other theories of suicide. In addition to these trait predispositions, ongoing research continues to support the importance of acquired aspects of capability for suicide, which come from many different
experiences.

Measuring Capability for Suicide

The Acquired Capability for Suicide Scale (ACSS) created by Van Orden et al. (2008) assesses the construct of one's fearlessness about self-injury and death, the extent to which individuals believe that they can perform dangerous tasks, and the degree of comfort with the potentially dangerous situations. According to Ribeiro et al. (2014), seven items were written to assess fearlessness about death and pain tolerance, and additional items were designed to assess provocative events. Bender et al. (2011) found that the ACSS total score was negatively

correlated with Linehan and colleagues' (1983) Fear of Suicide subscale from the Reasons for Living Inventory and positively correlated with a Beck Suicide Scale (Beck et al., 1979) item assessing the courage to attempt suicide. Bender et al. (2011) and Bryan (2013) have demonstrated significant positive associations between the ACSS and exposure to painful and provocative events. Ribeiro et al. (2014) also cite several studies that found strong associations between the ACSS scores and factors that contribute to suicidal desire and suicide-related outcomes, including self-reported suicidality (Bryan et al., 2013), clinician-rated suicide risk (Van Orden et al., 2008), and attempt history (e.g., M. Anestis et al., 2011). J. Anestis et al. (2018) found that the ACSS was positively correlated with the externalizing scales of the MMPI-2-RF, which were related to impulsivity, aggression, and overactivation. They also found that the ACSS was negatively correlated with the multiple specific fears (MSF) specific problem scale, indicating that higher scores on the ACSS were associated with fewer specific fears and phobias. Most current research uses a 5-item version that focuses specifically on fearlessness about death, typically labeled the ACSS-FAD (see Ribeiro et al., 2014).

Given that many of the measures are looking into fearlessness about death rather than the overall capturing of the facets of the capability for suicide, Ribeiro et al. (2014) highlighted a need for other measures to address capability for suicide, such as what builds an individual's habituation, their self-perceived capability for suicide, and pain tolerance. Wachtel and colleagues (2014, 2015) attempted to capture these new facets through the validation of a new measure, the German Capability for Suicide Questionnaire (GCSQ). The GCSQ included one-item assessing self-perceptions of capability for suicide in addition to the other items measuring fearlessness about death and pain tolerance. Even so, the GCSQ did not assess direct means of acquired capability (e.g., mental rehearsal); in response, George and colleagues (2016) created

the Acquired Capability with Rehearsal Suicide Scale which included items measuring fearlessness about death, pain tolerance, and preparation for suicide (Chu et al., 2017).

To understand what habituates an individual to have a higher capability for suicide, The Painful and Provocative Events scale (PPE; Gordon, Bender, & Joiner, unpublished manuscript) was developed to assess an individual's frequency to which they were exposed to a variety of painful/provocative experiences by using a 25-item scale (M. Anestis et al., 2011). A pressure algometer was utilized to measure participants' physical pain tolerance. The authors did find that individuals with higher scores on the ACSS tended to have higher pain tolerance with the algometer (Bender et al., 2011).

Klonsky and May (2015) provided an alternative model describing the capability for suicide by expanding from the acquired aspects. Specifically, they described three subcategories of variables: dispositional traits, acquired capabilities, and practical means. Dispositional traits refer to relevant variables that are driven by genetics (e.g., pain sensitivity), acquired capability refers to the same construct describe in the IPTS and ACSS literature, and practical capability describes the concrete factors (e.g., means, access, weapon familiarity) that make a suicide attempt easier. Klonsky and May developed a measure based on their conceptualization, the Suicide Capacity Scale (SCS-3), which has been found to have a strong associate with the ACSS (Van Orden et al., 2008).

Current Study

Of the three primary IPTS components, thwarted belongingness, perceived burdensomeness, and capability for suicide, capability has been the least studied from a structural perspective. Ribeiro et al. (2014) specifically identified the need for a better

empirically-grounded understanding of the factor composition of capability for suicide. Enhanced understanding of this component may contribute to more precise screening and assessment, as well as more specifically targeted intervention strategies. Thus, the primary focus of the current study is to examine a range of variables (e. g., suicide attempts, history of non-suicidal self-injury, ACSS-FAD items, etc.) to see if they form one or more cohesive latent factors representing capability for suicide. We will then examine the pattern of convergent and discriminant correlations for each factor using the MMPI-3 scale set, as it is a reliable, validated, and widely used measure of personality and psychopathology, including suicide-related factors. A key outcome, then, will be a better understanding of the IPTS construct capability for suicide. Secondarily, these findings may facilitate the use of the MMPI-3 in assessing capability for suicide.

Research Questions

1. Will underlying observed variables (e.g., suicide attempts, history of non-suicidal self-injury, ACSS-FAD items, additional suicide screening items) form one or more latent factors representing capability for suicide as defined by the IPTS?
2. Will the MMPI-3 scale set provide a meaningful characterization to gain better understanding of the capability factor or factors?

Method

Participants

Participants were recruited from general psychology courses at a mid-sized university in the southeast of the United States. A total of 308 students participated in the study. The average age was 19.8 years old (*SD* = 4.86), and the majority identified as female (59.7%), never married

(95.8%), and White (84.4%). Of the total sample, 299 participants provided valid MMPI-3 protocols leading to their inclusion in the study. Participants were excluded from the study if criteria suggested by the authors in the administration manual (i.e., CRIN < 80, VRIN < 80, TRIN < 80, F < 100, Fp < 100) were elevated invalidating the protocol.

Measures

Minnesota Multiphasic Personality Inventory-3 (MMPI; Ben-Porath & Tellegen, 2020) is an assessment of personality traits and psychopathology composed of 335 true/false items that is structured similarly to contemporary models of psychopathology. There are 10 validity scales and 42 substantive scales. The substantive scales are arranged in a hierarchy beginning with the Higher-Order Scales, which measure broad levels of Emotional/Internalizing Dysfunction, Thought Dysfunction, and Behavioral/Externalizing Dysfunction. The Restructured Clinical Scales compose the middle of the hierarchy, with the lowest scales being the Specific Problem Scales. The Specific Problem Scales measure various pathologies, including somatic/cognitive, internalizing, externalizing, and interpersonal symptoms. The MMPI-3 also includes scales based on the factors of the Personality Psychopathology Five (PSY-5; Harkness & McNulty, 1994) model. Finally, there are 10 scales that measure protocol validity, specifically measuring non-content based inconsistent responding and over- and under-reporting of psychopathology. Extensive data documenting reliability and validity are reported in the MMPI-3 technical manual (Ben-Porath & Tellegen, 2020b).

Acquired Capability for Suicide Scale- Fearlessness About Death (ACSS-FAD; Ribeiro et al., 2014) is a 5-item, Likert-type scale measure that assesses fearlessness about death. Respondents rate their traits and behaviors on a 5-point scale, ranging from “Not at all like me”

to “Very much like me”. The ACSS-FAD demonstrated good reliability in our sample (Cronbach’s α = .81). See Appendix A.

IPTS-based Semi-Structured Interview (Chu et al., 2015) is a semi-structured interview that assesses an individual’s level of suicide risk. There are 4 risk categories, Low, Moderate, Severe, and Extreme, and each level receives different levels of care and interventions to assist in the preventing death by suicide. See Appendix B for the abbreviated interview prompt form used in the current study, as well as Appendix C for the original interview from Chu et al., 2015 from which our abbreviated form was excerpted. The 18-item instrument described by Chu et al., 2015 is considered to be a tool to support the semi-structured clinical interview, rather than a standardized assessment device, thus the interview should yield equivalent results. All interviews were be coded by three undergraduate research assistants who have been trained in the IPTS model. For the current study, the three raters obtained a Fleiss’s κ of .88 suggesting strong agreement among the raters. See Appendix D for information concerning the rating process, which has also been drawn from Chu et al., 2015.

Multidimensional Behavioral Health Screen 2.0 (MBHS 2.0). The Multidimensional Behavioral health screen 1.0 (MBHS; McCord, 2020) is a recently developed instrument used to screen clinically relevant personality and psychopathology constructs in primary medical care settings. The MBHS 2.0 revision includes 29 items measuring somatization, demoralization, anhedonia, anxiety, suicidal tendencies, activation, cognitive complaints, disconstraint, and substance misuse. Directions for each item read “Indicate your response to each item by circling the number. Please answer as accurately and honestly as you can.” Participants then circle their response from a scale of 0-3, 0 indicating definitely false, 1 indicating somewhat false, 2 indicating somewhat true, and 3 indicating definitely true. The MBHS has demonstrated

adequate internal reliability, with an average mean inter-item correlation of .52 and an average Cronbach's alpha of .76. Convergent correlations with the MMPI-2-RF target scales are large for 8 of the 9 scales and medium for one scale; discriminant validity is acceptable to good (McCord, 2020). Additional items were added to the original 27 items in the MBHS 1.0 to more fully address constructs in the IPTS, resulting in 29 total items.

Procedure

There were two different procedures used in collecting data due to the COVID-19 pandemic. In both cases, participants volunteered to participate in the study in exchange for credit associated with their general psychology course. The procedure that was utilized prior to the COVID-19 pandemic had participants come to a common room, receive and sign informed consent forms, and then complete a number of questionnaires presented on Qualtrics. They included the measures mentioned previously and also completed the IPTS semi-structured interview. Participants who received the classification as moderate risk or higher would be asked if they were currently receiving mental health services and had a safety plan in place with their provider; if given a response of "yes," they were given a list of resources and encouraged to continue with their treatment. If they responded "no," then they were encouraged to begin services at the university counseling center (WCU Counseling and Psychological Services Center; CAPS). If participants who were classified as moderate or severe and they refused to be connected to CAPS, the university was alerted so they could follow-up with the participant and talk about resources the campus provides. If someone was identified as extreme risk and were not currently receiving mental health services, 911 was called.

The second procedure was implemented following the start of COVID-19 pandemic, that caused the university to end in-person data collection. All questionnaires and interviews were

administered using Zoom with HIPAA protections; specifically, participants were emailed a link to a Zoom meeting, a copy of the informed consent, and a list of suicide and problematic substance use resources the day before their scheduled session. Once on Zoom, participants verbally consented to providing information about their current location and contact information that would be used in case of emergency. Participants were then asked to electronically consent and completed all questionnaires on Qualtrics. Throughout the course of the study, certain measures were changed or dropped as we were collecting data for other projects as well, (e.g., removal of questionnaires about childhood trauma, addition of a measure on constrained behaviors). Participants then completed the semi-structured interviews (the substance use interview was dropped from the study once a sufficient sample had been collected) and similar processes occurred to address elevated suicide risk, with participants contact and location information used in cases of extreme risk. Both procedures and all changes in instrumentation were approved by the university IRB.

Statistical Analyses

For exploratory factor analysis (EFA), recommended sample size ranges from 10 to 20 participants per indicator variable (see, for example, Costello & Osborne, 2005; Wolf et al., 2013). With a set of 13 indicator variables, the upper end of this range would be 260 participants; our final sample of 299 valid protocols slightly exceeds this figure.

A series of exploratory factor analyses using maximum likelihood with robust standard errors estimation (MLR) and oblique rotation (Geomin) were conducted to explore the potential presence of a latent variable reflecting capability for suicide. MLR estimation was used because it does not assume that data are normally distributed (Muthén & Muthén, 2017), and there is a high potential for skew present in suicide-related data (Fabrigar et al., 1999). There were 13

indicators utilized in this analysis, including six questions from the Joiner Suicide Risk Assessment (questions 1, 3, 4, 5, 7, 9), all five items from the Fearlessness About Death questionnaire, and two items from the Multidimensional Behavioral Health Screen (see Table 3). Benchmarks of acceptability were set *a priori*: the root mean square error approximation (RMSEA) should be less than or equal to 0.06, and the comparative fit index (CFI) and Tucker-Lewis index (TLI) should be above a .90 (an excellent fit would be a .95 or above; Hu & Bentler, 1999). A cut-off score of .40 was used for each factor loading to determine if the variance associated with an indicator was meaningfully captured by a factor (Tabachnick et al., 2007). Upon factor extraction, correlations between the factors and scores on the MMPI-3 substantive scales were computed to better understand the nomological network of the capability for suicide construct.

Results

Of our total of 299 participants, the majority (94%) were categorized as low risk according to the IPTS interview. A total of 10 participants reached a moderate risk level, 5 had a severe risk level, and 2 participants had an extreme risk level. Suicide risk statistics typically exhibit skewness and kurtosis due to the low-level of individual who die or try to die by suicide. The skew and kurtosis of each item are in the demographics displayed in Table 1.

Eigenvalues are displayed in Table 2 and the scree plot is graphed in Figure 1. Initially, models specifying one, two, three, or four factors were examined. For initial models tested with the 13 indicators, the models that contained 1, 2, and 4 factors did not meet criteria for good model fit. As can be seen in Table 2, the 1-factor model had a significant χ^2 and poor fit on all other criteria. The 2-factor model similarly had a significant χ^2, adequate CFI and TLI, and poor

RMSEA. The 4-factor model had CFI and TLI of 1.0 which suggests that a coherent model cannot be found.

Thus, the 3-factor model emerged as the one most accurately reflecting the structure of the data with χ^2 (41) = 65.78, excellent CFI = .98, acceptable TLI = .96, and RMSEA = .05 [90% CI = .02 - .06]. In order to improve model fit further, modification indices were examined. The model fit indices suggested that a correlation between two indicators (*HIST and MBHS29 *r* = .78) that had a covariance = 147, which refers to how two random variables will change together. The high correlation and covariance indicate that they are measuring the same construct and move in the same direction and therefore should be correlated. Once these indicators were specified to correlate with each other, the modified three-factor model exhibited the best model fit. Regarding global fit for the model in the 3-factor model, chi-square test was significant, χ^2 (41) = 65.78, *p* = .008. The CFI and TLI coefficients met criteria for excellent fit, CFI = 0.98 and TLI = 0.96. RMSEA = 0.05 [90% CI = 0.02 – 0.06] which meets the benchmark for acceptability, indicating that this model fit the data well. Only factor loadings of .40 or higher were considered, and interpretive emphasis was determined by the highest loadings. The first and second factors were correlated with a *r* = .47 and the third factor was not correlated with either the first or second factor. This rotated solution is shown in Table 4.

Based on examination of indicators with the highest factor loadings, factor 1, Predispositional Fearlessness, with three factor loadings >.40, is marked by fearlessness about death, specifically with self-referential beliefs, as the items all pertained to how the individual personally felt about death. Factor 2, General Fearlessness, with three factor loadings >.40, is characterized by general fearlessness, with indicators being more pain-focused and other-referential, with the individual comparing their own pain tolerance and fear to how they perceive

others to be. Factor 3, Acquired Fearlessness, with five factor loadings >.40, is characterized by a fearlessness about suicide and has indicators that relate to history of suicide attempts and behavioral indicators such as non-suicidal self-injury, suicidal ideation, and a behavioral or feeling of being able to attempt suicide. Although 13 indicators were utilized in the factor analyses, two (current or recent plans/or methods and family history of suicide) did not load on any of the factors.

The three extracted factors were then correlated with scores from the 42 substantive scales of the MMPI-3 to better understand the nomological network of the capability for suicide construct (see Table 5). To account for shared method variance, only correlations of at least a medium effect size were interpreted as meaningful ($r \geq |.30|$; Cohen, 1988). Correlations between the first factor and the MMPI-3 substantive scale scores yielded three meaningful correlations. Specifically, factor 1 was meaningfully associated with scores on NFC (inefficacy): r = -.35, SFI (Self-Importance) r = .35, and NEGE (Negative Emotionality): r = -.30. The second factor yielded 15 meaningful correlations with scores on the following MMPI-3 scales: EID (Internalizing): r = .38, BXD (Externalizing): r = .36, RCd (Demoralization): r = .35, RC2 (Low Positive Emotions) r = .40, RC9 (Hypomanic Activation): r = .30, SUI (Suicide/Death Ideation): r = .47, HLP (Helplessness/Hopelessness): r = .33, SFD (Self-doubt): r = .33, STR (Stress): r = .38, BRF (Brief Restricted Fears): r = .34, AGG (Aggression): r = .31, SFI: r = -.32, DOM (Dominance): r = .40, AGGR (Aggressiveness): r = .47, and DISC (Disconstraint): r = .33. Finally, the third factor reflecting behavioral components of suicide (*NSSI) and history of suicide-related content yielded nine meaningful correlations with MMPI-3 scale scores. That is, EID: r = .30, RCd: r = .33, RC8: r = .32, SUI: r = .52, SFD: r = .31, ARX (Anxiety related): r = .33, SAV (Social Avoidance): r = -.38, SHY (Shyness): r = -.46, and INTR (Introversion): r = -

.36. For a full list of correlations between all three extracted factors and MMPI-3 substantive scale scores, see Table 4. Factor one and factor two were correlated (r = .47, p < .001), but factor three was not correlated with either factor one (r = .07, p = .62) or factor two (r = -.09, p = .56). Post-hoc analyses were conducted to assess potential gender differences on the 13 indicators. With 189 females, 118 males, and 3 others, no significant differences were found on: history of previous attempts, confidence to attempt, current plans, current suicidal/death ideation, FAD5 (I am not afraid to die), MBHS29 (number of previous attempts), and MBHS25 (I am not afraid to die). Individuals who identified as female produced significantly higher scores on non-suicidal self-injury, history of family suicide, FAD4 (the pain of dying is frightening to me), FAD3 (people describe me as fearless), FAD2 (I can tolerate more pain than most people), and FAD1 (things that score most people do not scare me).

Discussion

Previous research has not reached consensus regarding the factor structure of the third component of the interpersonal-psychological theory of suicide, the capability for suicide, with some arguing for a single coherent factor (e.g., Ribeiro et al., 2014) and others a multi-factor conceptualization (e.g., Klonsky & May, 2015). The results of the present EFA reflect an empirically-derived attempt at conceptualizing the construct of capability in two ways: first, looking at the significant loadings on each factor, and, secondly, by using the MMPI-3 correlated to characterize the factors to better understand what each represents. This was also an attempt to give better support to use the MMPI-3 in identifying the construct of capability and suicide-related topics. Capability is a very heterogenous and complex construct to study, but our study did find evidence of a three factor structure. With the use of only three measures with different

metrics, the MMPI-3 correlations allowed better characterization and understanding of what each factor is attempting to represent.

Our study resulted with three factors being identified from 13 indicator variables used in the EFA. There were two indicators (Current/Recent Plans/methods, and family history of suicide) did not load onto any of the three factors listed. The first factor was identified by items regarding self-referential fearlessness about death. When externally characterizing the factors using the MMPI-3, we found that the first factor resulted in one moderate positive correlation on the interpersonal scales and two moderate negative correlations on the internalizing scales. Overall, factor one has three indicators and seems be characterized by fearlessness about death in a self-referential capacity. When characterizing it against the MMPI-3 there is a negative correlation with internalizing scales indicating that individuals are lacking negative emotionality. It also has a positive correlation with self-confidence; when taken together this factor may indicate a more predispositional nature. An individual may consider themselves fearless or confident in general and with the lack of negative emotions indicating a predispositional fearlessness about death rather than acquired. These correlates indicate high self-confidence and a lack of internalizing dysfunction and thus may be more dispositional than situational in nature.

Factor two has three indicators and was the most difficult to characterize as a result of the the many MMPI-3 externalizing and internalizing facets. When looking at the loadings, factor two seems to be characterized by a general fearlessness about death, specifically other-referential. The indicators are all pertaining to an individuals fearlessness or pain tolerance compared to someone else's, which may indicate predispositional and acquired facets of capability. Specifically, the second-factor correlates include aggression, activation, disconstraint, and dominance. This factor also correlates positively with suicidal/death ideation,

demoralization, self-doubt, and helplessness/hopelessness, and negatively with behavior-restricting fear, self-importance, and stress. Predispositional traits are theorized to be increased disconstraint, activation, and fearlessness, which this factor all has correlates to. This indicates that this factor is detecting predispositional facets including needing higher activation or being an adrenaline seeker and engaging in behavior that is not constrained. The MMPI-3 correlates also indicate an externalizing or acquired component due to the elevated aggression, aggressiveness, and dominance. Externalizing facets such as these indicate that others are seeing the individual exhibit these symptoms, so this corroborates the factor loadings suggestion that this factor is other-referential. Further support for the general fearlessness and some hints at the acquired fearlessness is the increased suicidal/death ideation, hopelessness, demoralization, and self-doubt, as well as the lack of stress and self-confidence. Inferring from these correlations is that the individual developed demoralization, hopelessness, and self-doubt through experience which may be more acquired in nature.

The third factor has 5 indicators that all appear to be a fearlessness about suicide. The indicators all have to do with building capability, specifically the acquired portion such as the NSSI, previous attempts, and feelings of confidence that they could attempt. The MMPI-3 correlates include increased socialization and decreased shyness, but increased suicidal/death ideation, self-doubt, demoralization, and aberrant experiences. These correlations and factor items appear to be similar to the emotions and actions of individuals building the capability to die by suicide, including non-suicidal self-injury, suicidal ideation, and demoralization. Suicide attempts could also be characterized as aberrant experiences, which could assist in explaining this correlation.

In terms of the concept of fearlessness, the factor structure from the current study indicated a possible distinction between two types of fearlessness: fearlessness about death and fearlessness about suicide. Previous studies have found evidence of the complex nature of fearlessness, such as J. Anestis et al.'s (2018) study where they found fearlessness to be associated with fearlessness of suicide, self-reported courage to attempt suicide, and various outcomes associated with pain perception. In addition, Ribeiro et al. (2014) found that it may be possible that a more specific notion of fearlessness about one's own death may be even more relevant to the ability to engage in suicidal behavior. Furthermore, Smith et al. (2010) similarly found that self-reported fearlessness and pain insensitivity can differentiate suicide attempters and suicide ideators, suggesting that one's self-perception regarding their fear and pain tolerance are more functionally related to suicide attempts than psychophysiological reactivity to suicide-related stimuli. The current study adds to these findings by providing evidence that there may be different types of fearlessness that impact suicide risk in different ways (e.g., fearlessness that remains at an ideation level and fearlessness that is associated with attempts). Capability is the least studied of the three factors making up the interpersonal theory of suicide which was the motivation of the current study. Capability for suicide was previously known as the acquired capacity for suicide and has changed as a result of theories that individuals are not just acquiring capability, but instead innately have a predisposition to fearlessness and pain tolerance. The current study corroborates this update in the theory with the three factors displaying at least two different sources of capability (acquired and predisposition). Klonsky & May (2015) theorized that capability is actually three factors (predispositional, acquired, and practical means) which the current study gives partial support for. Our understanding of capability is furthered that more

than one factor was found suggesting that capability is found but it is also complicated due to the constraints of our measures metrics.

Limitations

A limitation of our study was the use of archival data, which limited our potential indicators of capability to those at hand. Suicide is a skewed and an abnormally distributed construct which means that it is rare in the general population, therefore a limitation of our study is that we collected it from college aged students (Becker et al., 2020). If the data had been collected in a sample of individuals with a higher-risk level or had a history of suicidal ideation, our results may be different. In hindsight, we recognized that we included a variable that was ideational in nature. Suicidal ideation is the accumulation of thwarted belongingness and perceived burdensomeness which are separate from capability; therefore by including an ideation indicator we are confounding our results. It was also challenging to understand if the items were trying to capture dispositional or acquired symptomology/histories, so for that reason it was difficult to differentiate whether the factors had acquired or predispositional tendencies. Another limitation included the measures thought to capture the construct capability had different scales to measure it including Likert scales from 1-5, 0-10, and 0-3, which created the possibility that during the factor analysis that these questions would cluster together based on measurement scale into factors instead of capturing the true latent factor differences. Measurement differences could also have influenced the EFA because some of the items were self-report questionnaires and some were based on interview questions, and differences in measurement method can influence factor analysis results (DeCoster, 1998). There was also two instances where the same questions were present on different measures (i.e., MBHS 29 and Joiner indexing suicide attempts and MBHS25 and FAD5 indexing fearlessness) which means they may have been

answered the same way and therefore clustered for reasons other than indexing capability. Although we did see limiting factor and noise within the data, we are able to understand a bit more about capability as a construct.

Conclusions and Future Directions

Capability is a heterogenous and complex construct, and even considering the limitations the results do display that capability is most likely not one factor, but a multi-factor construct. The common thread of fearlessness throughout the factors made sense and was even interesting considering the types of fearlessness found (i.e., general fearlessness, fearlessness about death, and fearlessness about suicide). Further research should use more assessments or measures theorized to study capability to better capture the full understanding of what makes up the umbrella term capability for suicide. This could be done by researchers including measures that try to differentiate between components of fearlessness that may be inherent/predispositional versus those that may be acquired. Such research would aid us in identifying the most salient qualities of capability that may be associated with someone's general suicidal ideation, whether they will attempt suicide, and how lethal their attempt might be.

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Table 1

Demographics

Variables	Mean	SD	Frequency (No/Yes)	Kurtosis	Skewness	Range (Min-Max)
MBHS25	1.01	.16	118/181	-.85	.56	0-3
MBHS29	.99	.51	265/34	14.02	3.65	0-3
FAD1	1.81	1.29	62/236	-1.05	.01	0-4
FAD2	2.06	1.38	58/240	-1.22	-.16	0-4
FAD3	1.64	1.27	74/ 224	-1.04	.22	0-4
FAD4	2.35	1.46	41/257	-1.37	-.24	0-4
FAD5	1.43	1.42	117 / 181	-1.10	.50	0-4
COULD*	1.02	1.72	179/115	4.74	2.15	0-9
CURRSI*	.17	.48	262/37	7.50	2.90	0-2
CURRPlans*	.01	.10	295/4	95.97	9.87	0-1
HIST	.18	.56	264/35	12.13	3.46	0-3
NSSI*	.25	.51	236/63	3.10	1.97	0-2
FAMHX*	.23	.42	230/69	-.35	1.28	0-1

Table 2

Eigenvalues for Sample Correlation Matrix

Factors	Eigenvalues
1	3.49
2	2.31
3	1.41
4	1.16
5	0.91
6	0.89
7	0.71
8	0.52
9	0.44
10	0.26
11	0.34
12	0.30
13	0.17

Table 3

Factor Models of Fit

Factor	χ^2 (df)	p-value	CFI	TLI	RMSEA	REMSEA 90% CI
1	χ^2 (65) = 719.39	$p < .001$	.49	.39	.18	.17 - .20
2	χ^2 (53) = 296.10	$p < .001$	.81	.72	.12	.11 – .14
3	χ^2 (42) = 97.96	$p < .001$	.96	.92	.05	.05 – .08
3b w/ corr	χ^2 (41) = 65.78	$p = .008$	.98	.96	.05	.02 – .06
4	χ^2 (32) = 23.58	$p = .86$	1	1	.00	.00 – .02

Note: 3b w/ corr = 3-factor model with a correlation between history of attempts. CFI = Comparative Fit Index, TLI = Tucker Lewis Index, RMSEA = Root Mean Square Error Approximation

Table 4

Factor Loadings

Indicators	1	2	3
MBHS25 (I am not afraid to die)	**.84**	.00	.01
MBHS29 (Number of previous attempts)	-.01	.05	**.44**
FAD1 (Things that scare most people, do not scare me)	.18	**.66**	.00
FAD2 (I can tolerate more pain than most people)	.00	**.82**	.11
FAD3 (People describe me as fearless)	.00	**.73**	-.07
FAD4 (The pain of dying is frightening to me)	**.72**	.14	-.02
FAD5 (I am not afraid to die)	**.80**	.00	.02
*CURRSI (Current SI/DI)	.12	-.01	**.65**
*CURRPLAN (Current/recent plans and/or methods)	-.08	.02	.11
*HIST (History of Attempts)	-.04	.12	**.49**
*NSSI (History of non-suicidal self-injury)	.00	.11	**.55**
*FAMHX (History of Suicide in Family)	.05	.02	.18
*COULD (Confidence that you could attempt suicide)	.26	-.07	**.39**

Note: Values in boldface reflect primary loading. Variables names with leading asterisk were drawn from the Joiner Suicide Risk Interview. [a.] Multidimensional Behavioral Health Screener (MBHS). [b.] Fearlessness About Death (FAD).

Table 5

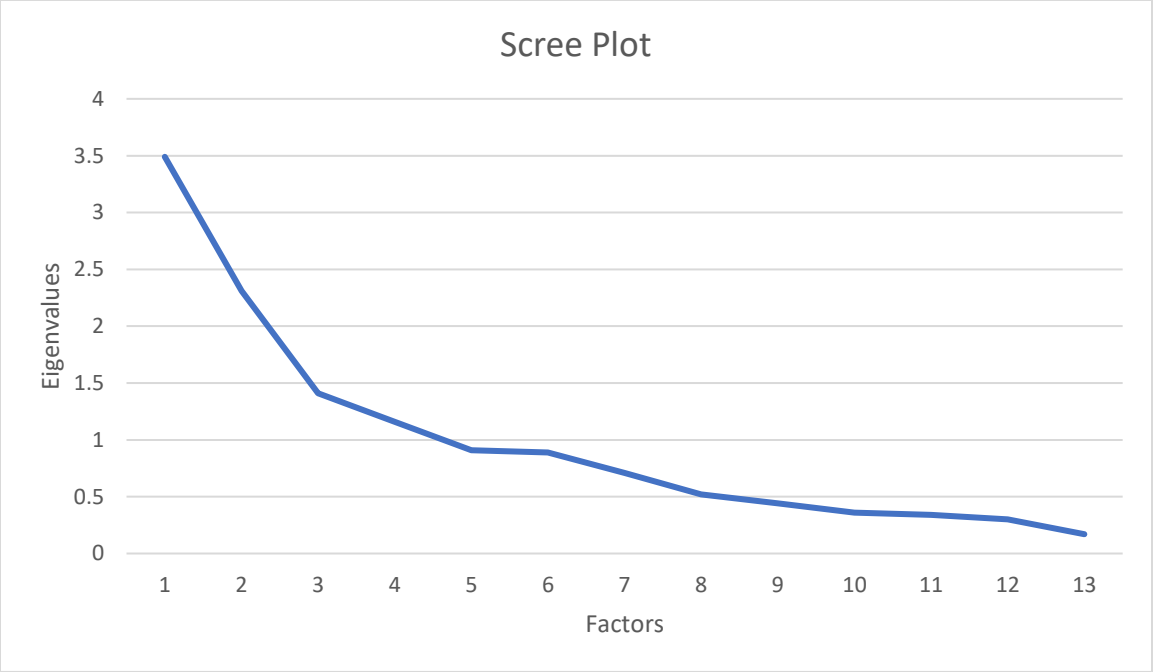
Correlations Between Capability Factor and MMPI-3 Substantive Scale Score.

MMPI-3 Substantive Scales	Factor		
	1	2	3
Somatic/Cognitive Dysfunction			
RC1-Somatic Complaints	--	--	--
MLS-Malaise	.22	-.08	.22
NUC-Neurological Complaints	.12	.01	.21
EAT-Eating Concerns	.20	-.01	.26
COG-Cognitive Complaints	.17	-.06	.27
Emotional Dysfunction			
EID-Emotional/Internalizing Dysfunction	-.27	**.38**	**.30**
RCd-Demoralization	-.17	**.35**	**.33**
SUI-Suicidal/Death Ideation	-.01	**.47**	**.52**
HLP-Helplessness/Hopelessness	-.14	**.34**	.20
SFD-Self Doubt	-.23	**.33**	**.31**
NFC-Inefficacy	**-.35**	.19	.20
RC2-Low Positive Emotions	-.23	**.40**	.17
INTR-Introversion/Low Positive Emotions	.17	.19	**-.36**
RC7-Dysfunctional Negative Emotions	-.24	.15	.29
STR-Stress	-.08	**-.38**	.22
WRY-Worry	-.28	.13	.27
CMP-Compulsivity	-.01	.01	.12
ARX- Anxiety Related Experiences	-.22	.19	**.33**
ANP-Anger Proneness	.15	.01	.18
BRF-Behavior Restricting Fears	-.16	**-.34**	.18
NEGE-Negative Emotionality	**-.30**	.15	.29
Thought Dysfunction			
THD-Thought Dysfunction	.09	.19	.20
RC6-Ideas of Persecution	.08	.16	.15
RC8-Aberrant Experiences	.17	.14	**.32**
PSYC-Psychoticism	.12	.16	.18
Behavioral Dysfunction			
BXD-Behavioral/Externalizing Dysfunction	.27	**.36**	.17
RC4-Antisocial Behavior	.25	.24	.19
FML-Family Problems	.17	.04	.17
JCP-Juvenile Conduct Problems	.13	.21	.19
SUB-Substance Abuse	.26	.26	.14
RC9-Hypomanic Activation	.16	**.30**	.10
IMP-Impulsivity	.18	.15	.07
ACT-Activation	.06	.18	.16
AGG-Aggression	.25	**.31**	.12
CYN-Cynicism	.20	.28	.19
DISC-Disconstraint	.28	**.33**	.18
Interpersonal Functioning			
SFI-Self Importance	**.35**	**-.32**	-.14
DOM-Dominance	.01	**.40**	-.06
AGGR-Aggressiveness	.14	**.47**	-.03
DSF-Disaffiliativeness	.28	.06	.19
SAV-Social Avoidance	.10	.18	**-.38**
SHY-Shyness	-.06	.14	**-.46**

Note: Meaningful moderate correlations (≥|.30|) are bolded.

Figure 1

Scree Plot



APPENDIX A: ACSS-FAD

Please read each item below and indicate to what extent you feel the statement describes you. Rate each statement using the scale below and indicate your responses on your answer sheet.

	Not at all like me				Very much like me
1. Things that scare most people do not scare me.	1	2	3	4	5
2. I can tolerate more pain than most people.	1	2	3	4	5
3. People describe me as fearless.	1	2	3	4	5
4. The pain of dying is frightening to me.	1	2	3	4	5
5. I am not afraid to die.	1	2	3	4	5

APPENDIX B: IPTS SEMI-STRUCTURED INTERVIEW

Current SI/DI
-
Current/recent plans and/or methods
-
How strong is your intent to kill yourself? (e. g., current, next week, past week?) 0 = no intent at all, 10 = definite intent
-
History of attempts
-
History of self-injury
-
History of suicide in family
-
Do you feel confident you could attempt suicide (0[definitely could not] - 10 [definitely could])
-
Do you feel connected with others?
-
Thoughts that others would be better off if you were gone
-
Hopelessness (0 [hopeful/good] - 10[not hopeful at all/bad])
-
Recent stressors
-
How do you cope?
-
Mental health treatment
-

APPENDIX C: CHU ET AL., 2015 SUICIDE RISK INTERVIEW

Sample Suicide Risk Assessment Form

Desire & Ideation

1. Have you been having thoughts of suicide? …of killing yourself? Tell me about that.
   a. How often?
   b. How long lasting (preoccupation)?
2. Do you think about wanting to be dead?
   a. How often?
   b. How long lasting?

Resolved Plans & Preparations

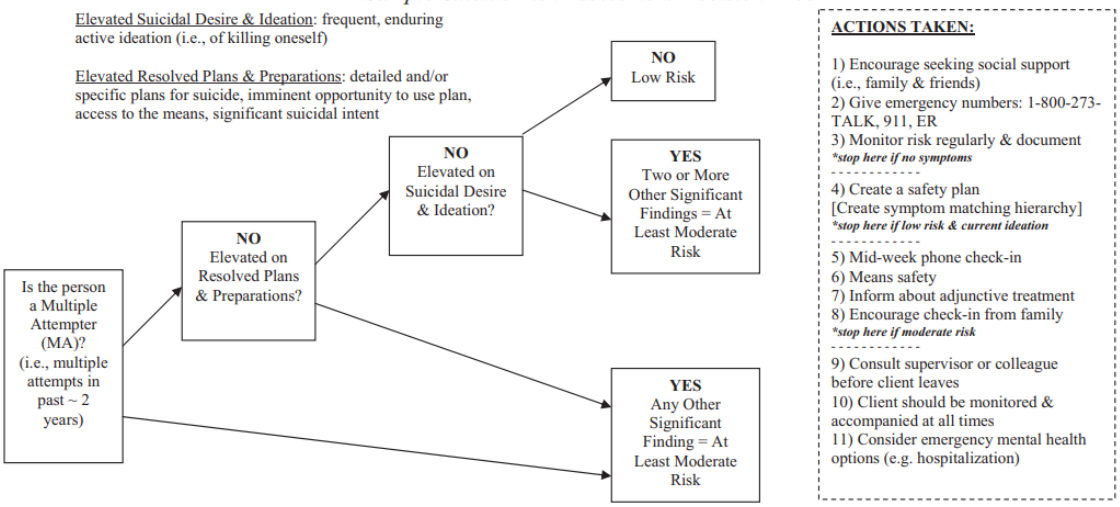
3. Have you attempted suicide in the past? Did you hurt yourself with the intent to die? How many times? Methods used? What happened (e.g., outcome, severity)? If more than one attempt, when was your most recent suicide attempt…in the last two years?
4. How strong is your intent to kill yourself… [e.g., current, next week, past week]? 0 *no intent at all*, 10 *definite intent*
5. Do you have any plan(s) for how you would kill yourself [detail, specificity]? If no, ever?
6. Do you know when you expect to use your plan? Do you think you'll have an opportunity to kill yourself?
7. Have you acquired means for use in a suicide attempt [pills, a gun, etc.]?
8. Have you made preparations for a suicide attempt? [e.g., buying pills, suicide note, giving away personal items]

Other Risk Factors

9. Have you ever intentionally caused yourself physical harm by cutting, burning, or other means, without the intent to die?
10. Is there any history of self-injury or suicide in your family?
11. Do you feel confident you could attempt suicide? Do you feel afraid to die? 0 *not at all afraid* 10 *very afraid*
12. Do you feel connected to other people? Do you live alone? Do you have someone you can call when you're feeling badly? Who?
13. Sometimes people think: "the people in my life would be better off I were gone." Do you think that?
14. Do you feel hopeless? Tell me more about that.
15. Has anything especially stressful happened to you recently?
16. When you're feeling badly, how do you cope? Sometimes when people feel badly, they do impulsive things to feel better. Has this ever happened to you? [e.g., cutting your skin, drinking alcohol, running away, binge eating, promiscuous sex, physical aggression, shoplifting].
17. Other warning signs: 1) agitation, 2) social withdrawal, 3) insomnia/nightmares, 4) marked irritability
18. Consider past/current psychopathology e.g., Major Depression, Bipolar, Borderline Personality, Schizophrenia, Eating Disorder

APPENDIX D: CHU ET AL., 2015 SUICIDE RISK LEVEL RATING

Sample Suicide Risk Assessment Decision Tree



Other Significant Risk Factors: capability for suicide (e.g., non-suicidal self-injury; fearlessness about death); thwarted belongingness; perceived burdensomeness; hopelessne family history; recent stressful life events; impulsivity; presence of acute indicators of risk (agitation; social withdrawal; insomnia/nightmares; marked irritability; severe affecti states, significant weight loss)

Low Risk:
-No symptoms
-MA + no other risk factors
-Non-MA + ideation [limited intensity/ duration], no/mild plans/prep, and no/few significant findings

Moderate Risk:
-MA + other significant finding
-Non-MA + mod/severe plans/prep
-Non-MA + mod/severe desire/ideation, no/mild plans/prep, and 2+ significant findings

Severe Risk:
-MA + 2+ significant findings
-Non-MA + mod/severe plans/prep, and 1+ significant finding(s)

Extreme Risk:
-MA + severe plans/prep
-Non-MA + severe plans/prep and 2+ significant findings

Documentation: "Suicide risk was assessed according to Joiner et al. (1999) and determined to be [low/moderate/severe/extreme] due to…[e.g., ideation, plans, preparations, etc.]. ACTIONS TAKEN: [e.g., safety plan, emergency numbers, consulted with supervisor, etc.]. Risk will continue to be monitored."

Consult if: a) unsure of risk level or actions taken, b) mod to severe risk level or above, c) notable increase in symptoms