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Fearlessness about Death: The psychometric properties and construct validity of the revision to the Acquired Capability for Suicide Scale

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Abstract

The Interpersonal Theory of Suicide proposes that suicidal behavior is so frightening that in order for an individual to engage in suicidal behavior, desire for suicide must be accompanied by the capability to do so. The capability for suicide is characterized by both a sense of fearlessness about death and elevated physiological pain tolerance. The primary aim of the current project was to reevaluate and revise the Acquired Capability for Suicide Scale (ACSS) and offer a revision to the scale. Expert review of the scale items resulted in retaining seven items assessing fearlessness about death. The recommendation is made to refer to the revised scale as the ACSS-Fearlessness about Death (ACSS-FAD) to reflect its content more specifically. A model with the 7 retained items provided good fit to the data across three independent samples of young adults. Multiple group analyses examining measurement invariance across men and women found that the latent structure of the scale is comparable across gender. Data are also presented demonstrating convergent and discriminant validity for the scale in young adults and an inpatient psychiatric sample. Findings support the viability of the ACSS-FAD, indicating the scale has a replicable factor structure that generalizes across males and females and is substantively related to the construct of fearlessness about death. Taken together, the present work extends our knowledge of

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the psychometrics of the ACSS-FAD in particular and the nature of fearlessness about death in general.

Keywords

acquired capability for suicide; fearlessness about death; interpersonal theory of suicide; suicide; suicidal behavior

Suicide is a leading cause of death worldwide. However, most individuals who have thoughts of suicide or even have a history of suicide attempts – one of the strongest risk factors for suicide (Wenzel et al., 2011) – will not die by suicide. In the United States, for instance, it is estimated that between 5.6% and 14.3% of the population will experience thoughts of suicide, and between 1.9% and 8.7% of the population has a history of suicide attempts – yet, only about 0.01% of the population ultimately dies by suicide (Nock et al., 2008).

Many theories of suicide assume that stronger desire for suicide differentiates those who think about suicide from those who act on those thoughts and die by suicide. These theories therefore focus on causes of desire for suicide, including hopelessness (Beck, 1986), emotion dysregulation (Linehan, 1993), and psychache and perturbation (Shneidman, 1993). The Interpersonal Theory of Suicide (Joiner, 2005; Van Orden et al., 2010) rests on a different assumption – namely, that desire alone is not sufficient for an individual to die by suicide. Rather, the theory proposes that suicidal behavior is so daunting that in order for an individual to engage in suicidal behavior, desire must be accompanied by the capability to do so.

The theory suggests that humans are biologically prepared to be frightened of suicide because engaging in suicidal behavior necessarily involves exposure to stimuli and cues that are associated with threats to survival. Thus, frankly considering suicide will naturally elicit fear. In order to plan and prepare for suicide, an individual must stare down that fear, which the theory suggests is not an act most people have the capability to do. In order to develop this capability, much like overcoming a phobia, the theory suggests that individuals must have repeated exposure and habituation to the potentially lethal, painful, and instinctively fearsome stimuli.

Consistent with the Interpersonal Theory of Suicide, research has demonstrated that fear of death and elevated pain tolerance play important roles in suicidal behavior. Across the lifespan, past suicide attempters endorse attenuated fear of death (Minton & Brush, 1980; Gutierrez, King, & Ghaziuddin, 1996; Orbach, Feshbach, Carlson & Ellenberg, 1984). Fear of suicide discriminates past attempters from non-attempters (Malone, Oquendo, Haas, Li, & Mann, 2000), and individuals with a history of suicidal and non-suicidal self-injurious behavior endorse less fear of suicide than individuals without a history of self-injurious behavior, even when compared to individuals with a history of serious suicidal ideation (Linehan, Goodstein, Nielsen, & Chiles, 1983). Suicide attempters also evidence higher pain tolerance when compared to nonsuicidal controls, accidental injury victims, and nonsuicidal inpatients (Orbach et al., 1996a; Orbach et al., 1996b).

Despite existing indirect evidence, there are a number of important remaining questions about the nature of the acquired capability. To address these questions, researchers need sound measures of fearlessness about death and pain tolerance. One potentially viable instrument is the Acquired Capability for Suicide Scale (ACSS), which was designed to assess the construct as originally delineated by Joiner (2005). Preliminary analyses were conducted following data collection for a study examining the relationship between impulsivity and acquired capability for suicide (Bender et al., 2011) to examine the measure. In addition to an adequate alpha level, 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 item assessing courage to attempt suicide. The ACSS also did not significantly correlate with suicidal desire or depression, which provided evidence of discriminant validity, as capability should be distinct from suicidal desire (Van Orden et al., 2010).

Since it was first introduced, 26 peer-reviewed publications have been published using the ACSS (see Supplemental Table S1) with results largely consistent with the interpersonal theory's description of the acquired capability construct. Studies have repeatedly demonstrated significant positive associations between the ACSS and exposure to painful and provocative events (e.g., Bender et al., 2011; Bryan et al., 2013). Several studies have also documented associations between the interaction of 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., Anestis & Joiner, 2011).

Despite findings in line with the theory, a number of factors underscore the need to reevaluate and potentially redevelop the ACSS with respect to its form. First, one primary motivation for reevaluation is that a definitive, empirically-derived factor structure has not yet been determined. Consequently, as is documented in Table S1, there has been substantial inconsistency in past research with respect to the forms of the ACSS administered and no data presented to support the equivalence of the different forms. Indeed, it should be noted that fewer than half of the published peer-reviewed studies have used the ACSS in its original form, with most studies utilizing versions comprised of a subset of between 5 and 8 items. With respect to the reliability of these scales, the majority of published studies have failed to provide extensive psychometric data on the reliability of any form of the scale – typically, only coefficient alpha levels have been reported. Although the full measure has demonstrated alphas of ranging from .81–.88, the 5-item version (which has been published most frequently) consistently evidences substantially poorer internal consistency with alpha values ranging from .63–.72. Given that low reliability reduces the probability of detecting an effect even if the effect exists (i.e., increases the likelihood of type II error), continuing to use a scale with low reliability is a concern. There has been one recent study conducted by Smith, Wolford-Clevenger, Mandrachia, and Jahn (2012) that did conduct more extensive psychometric analyses. In this study, exploratory factor analysis was used to examine the scale's structure in male inmates and reported that a four-factor solution provided the best fit. These findings stand in contrast to what would be expected based on the interpersonal theory, which would propose a two-factor solution comprised of fearlessness about death and pain tolerance. As such, this preliminary evidence suggests that the scale as a whole

may not accurately reflect the nature of the construct as delineated by the interpersonal theory of suicide and further stress the need for reevaluation and potentially revision of the scale.

Questions also remain regarding the scale's generalizability, as no studies have formally evaluated the generalizability of any of the forms of the ACSS, despite having been administered across diverse populations. Although research in this domain may be wide-ranging (e.g., ethnicity, age, clinical severity, among many other factors) – gender invariance analyses would be particularly fruitful. According to the interpersonal theory, males are expected to demonstrate higher levels of the acquired capability for suicide than females, despite the hypothesized process of acquiring the capability for suicide being the same (Joiner, 2005; Van Orden et al., 2010). Consistent with this proposition, a substantial literature base has documented that there are gender differences in pain tolerance (Fillingim, King, Ribeiro-DaSilva, Rahim-Williams, & Riley, 2009) and fear of suicide (Ellis & Lamis, 2007; McLaren, 2011) with males demonstrating higher pain tolerance and lower fear of suicide than females. In order to formally test this hypothesis with the ACSS, it is necessary to establish that its factor structure and loadings are equivalent across men and women (Brown, 2006).

An additional reason underscoring the need for reevaluation and potential revision of the scale is that several significant developments have been made regarding the conceptualization of the acquired capability since the ACSS was first introduced. Joiner first described the construct of acquired capability for suicide in *Why People Die By Suicide* in 2005. In this work, Joiner proposed a preliminary definition of acquired capability that lacked specificity. For instance, Joiner writes, "Those who develop the capacity for serious suicidal behavior might become more fearless (if fear actually decreases), or they might become more courageous (if fear persists but they are better able to tolerate it), or both" (p. 53). By extension, the content coverage of the item pool of the ACSS is also fairly diffuse, as the scale was based largely on the preliminary description provided by Joiner (2005). A growing literature base on the acquired capability for suicide, however, has resulted in greater precision of the construct's definition. This is evident in the description of the construct provided in the recent extensive review and elaboration of the interpersonal theory by Van Orden and colleagues (2010), which defines the acquired capability for suicide as a multidimensional latent variable involving dimensions of lowered fear of death and increased physical pain tolerance. Therefore, although Joiner (2005) references a sense of fearlessness as a key feature of the acquired capability for suicide, Van Orden and colleagues (2010) specify that individuals must evidence a reduced fear of death in particular. Similarly, although Joiner (2005) argues for the role of increased pain tolerance in general, the more recent definition offers further precision. Further, differential relationships between both facets of acquired capability and suicidal behavior have also been suggested by Van Orden and colleagues (2010), which were not originally suggested by Joiner (2005). Specifically, fearlessness about death is implicated in the transition from active suicidal desire to suicidal intent; pain tolerance is implicated in determining the medical lethality of an attempt.

Therefore, in the present project we propose a revision to the ACSS that is consistent with the current theoretical conceptualization of the acquired capability for suicide construct and evidences a psychometrically sound factor structure. To this end, the aims of the current research were: (1) develop a viable latent variable model of the scale, (2) examine its generalizability across men and women, and (3) provide evidence of convergent and discriminant validity. We do so using five independent convenience samples. According to the theory (Van Orden et al., 2010), the construct of acquired capability exists on a continuum in both clinical and non-clinical populations and the nature of the construct should not differ between these groups. Considering this, we elected to use samples of nonclinical young adults primarily given that it would be practically efficient and theoretically appropriate (Highhouse & Gillepsie, 2008). Data from an inpatient sample is also included in order to provide preliminary evidence of the construct validity among clinical populations.

Aim I: Development of a Measurement Model

A series of three confirmatory factor analyses (CFA) were used to examine the factor structure of the scale. CFA is preferred over more data-driven techniques for the present research, given that the development of the scale was heavily based on theory.

Methods

Participants and Procedures—All samples presented in this paper were drawn from independent studies (see Table S3 for samples' primary sources and original aims), and all young adult samples (i.e., Samples 1–4) were drawn from the same large southeastern university. All study procedures were reviewed and approved by the university's Institutional Review Board. All participants first provided full informed consent and were fully debriefed after participating.

Sample 1: The sample consisted of 227 undergraduates (65.4% female) with a mean age of 19.44 (SD = 2.59; range: 17–45) who participated in a study examining the effects of social exclusion on self-injurious behavior. Approximately 84.0% were Caucasian, 12.3% African-American/Black, 2.8% Asian/Asian-American, 0.5% Pacific Islander/Native Hawaiian, and 0.5% American Indian/Alaska Native. About 16.4% were of Hispanic/Latino ethnicity. Participants completed a randomly-ordered battery of questionnaires assessing demographics, personality, and psychological symptoms followed by a social exclusion manipulation.[1]

Sample 2: This sample consisted of 257 undergraduates (59.8% female) with a mean age of 18.97 (SD = 1.58; range: 17–34) who participated in a study examining the relationship between impulsivity and suicidal behavior (Bender et al., 2011)[2]. About 71.4% of the sample was Caucasian, 14.7% African-American/Black, 1.3% Asian, and the remainder identified with a race not listed. About 10.3% endorsed Hispanic/Latino ethnicity.

[1]Only questionnaire data, which were collected prior to the experimental manipulation, were used for analyses.
[2]Although the variables presented in this project have some overlap with those presented in the work by Bender and colleagues (2011), the analyses presented in current project are unique.

Participants were asked to complete a battery of self-report inventories and a behavioral pain tolerance assessment using a pressure algometer; ordering of the tasks was counter-balanced. Participants were all right-handed non-smokers required to abstain from analgesics and alcohol for at least 8 hours and from sugary food for at least 1 hour prior to the study, as these factors have been shown to affect pain perception (Mercer & Holder, 1997; Murray & Hagan, 1973; Pomerleau et al., 1984).

Sample 3: This sample consisted of 723 undergraduates (55.5% female) with a mean age of 18.86 (SD = 1.43; range: 17–35). About 80.5% of the sample was Caucasian, 10.8% African-American/Black, 4.1% Asian and the remainder identified with another race not provided. Approximately 21.5% identified as Hispanic/Latino. The study consisted entirely of completing a battery of questionnaires; the ACSS was presented first in the battery.

Measures: Acquired Capability for Suicide Scale—The ACSS is a self-report instrument designed by the authors to assess levels of the acquired capability for suicide. In its original form, the scale consists of 20 items (see Supplemental Table S2). The content of the items was rationally derived based on the interpersonal theory's original description of the construct of acquired capability (see Joiner, 2005). As noted above, there have been significant advances in our understanding and conceptualization of the construct. According to Van Orden et al., (2010), three constructs are relevant to the acquired capability: fearlessness about death, pain tolerance, and painful and provocative events. However, only the first two (fearlessness about death; pain tolerance) are identified as defining underlying substrates of acquired capability; painful and provocative events are, according to Van Orden et al. (2010), causal in the development of the acquired capability for suicide. In order to identify which ACSS items remained viable in the context of the most recent conceptualization of the interpersonal theory, the original authors of the scale (TB; KG) identified which items were designed to measure those three constructs related to the acquired capability for suicide. Per the authors of the scale, seven items were written to assess fearlessness about death, one was written to assess pain tolerance, and the remaining items were designed to assess painful and provocative events. As the latter are causal and not defining aspects of the acquired capability, they were dropped from the scale. Including only one pain tolerance item precluded constructing a latent measurement model of the pain tolerance domain. As such, seven items indexing a sense of fearlessness about death were retained for our analyses: 7 (*The fact that I am going to die does not affect me*); 8 (*The pain involved in dying frightens me*); 10 (*I am very much afraid to die*); 11 (*It does not make me nervous when people talk about death*); 13 (*The prospect of my own death arouses anxiety in me*); 14 (*I am not disturbed by death being the end of life as I know it*); and, 19 (*I am not at all afraid to die*). Results from a series of independent exploratory factor analyses conducted independently by authors JR and TW prior to the expert review of the scale substantiated the selection of these items. Findings supported a one-factor solution that included the items tested in confirmatory factor analytic framework in the present paper. Of note, these analyses were also conducted in samples not used in the present project.

As the content of these items reflects only a sense of fearlessness about death (and not pain tolerance), we refer to this set of items as the Acquired Capability for Suicide Scale –

Fearlessness About Death (ACSS-FAD) to more precisely reflect the scale's content. Although in this section we examine the viability of the one-factor model defined by the seven items noted above, all samples were administered the full version of the scale because data collection for all samples occurred prior to the expert review of the scale described above. All items are rated on a scale from 0 *not at all like me* to 4 *very much like me.* Total scores on the seven-item version may range from 0 to 28, with higher scores indicating greater levels of fearlessness about death. Coefficient alpha indicated adequate internal consistency (Sample 1: α=.82; Sample 2: α=.77; Sample 3: α=.83). Across samples, respondents endorsed, on average, a likert-scale value of "2" (Sample 1: 2.15; Sample 2: 2.14; Sample 3: 2.02), indicating that, across samples, respondents on average were endorsing a moderate degree of fearlessness about death as indexed by observed scores on individual ACSS-FAD items.

Results

Descriptive statistics of the ACSS-FAD items as well as their inter-item correlations across all samples are available as supplemental materials online (Table S4). Prior to conducting primary analyses, data from all samples were screened for outliers and violations of normality. Several variables evidenced potentially problematic levels of skew and kurtosis; therefore, robust Maximum Likelihood (MLR) was selected as the estimation method for our analysis. Full information maximum likelihood estimation (FIML) was used to handle missing data. It should be noted that FIML functions to maximize the likelihood of the model given the data and assumes multivariate normality; however, when data are non-normal, FIML can be used (with MLR) to obtain standard errors and test statistics robust to non-normality (Brown, 2006). Across all samples that were used in structural equation modeling analyses in this paper the lowest covariance coverage value for a pair of items was .74 (Sample 1: .99; Sample 2: 79; Sample 3: .99; Sample 4: .74); Monte Carlo studies suggest that this amount of missing data can be handled appropriately with FIML (e.g., Enders & Bandalos, 2001). Post hoc power analyses indicated the minimum sample size for sufficient power for the test of not close fit was 598 for power of .80; thus, power may present a problem for Samples 1 (n=227) and 2 (n=257) but not 3 (n=723).

The recommendations of Hu and Bentler (1999) and Brown (2006) were used to evaluate goodness-of-fit. For indices of absolute fit, the chi-square statistic (χ^2) and the standardized root mean square residual (SRMR) were used, with non-significance of χ^2 interpreted as perfect fit and SRMR values of less than .10 indicating adequate fit and less than .08 indicating good fit. The Root Mean Square Error of Approximation (RMSEA) is a parsimony-corrected fit statistic; RMSEA values less than .05 indicate good fit and values greater than .05 and less than or equal to .08 indicate adequate fit. The Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) are comparative fit indices. CFI and TLI values between .90 and .95 may suggest adequate model fit.

For the present model, which consisted of a single latent variable with seven observable indicators and no correlated residuals, goodness-of-fit indices across all samples largely supported the model. With the exception of the significant YB χ^2, all other indices indicated good-to-excellent fit to the data (see Table 1).

In an effort to identify any potential areas of strain, modification indices (MI), expected parameter change (EPC), and standardized residuals were considered. As values may reflect idiosyncratic data issues of a particular sample, we considered the theoretical relevance of the indicated modification and ensured that it replicated across samples prior to respecifying the model. For Sample 1, residual correlations were prominent for the associations between Item 8 (*The pain involved in death frightens me [Reversed (R)]*) and 10 (*I am very much afraid to die (R)*; MI = 11.06, EPC = .26). Sample 2 failed to reveal any significant areas of strain. Two modification indices emerged in Sample 3: Item 10 (*I am very much afraid to die (R)*) with Item 8 (*The pain involved in dying frightens me (R),* MI = 21.41; EPC = .22) and Item 19 (*I am not at all afraid to die*) with Item 7 (*The fact that I am going to die does not affect me*; MI = 19.17; EPC = .20). We elected not to make changes to the model because the model demonstrated adequate fit across samples, there was no redundancy of modification indices across samples, and there is little theoretical justification for any of the suggested modifications. Standardized residuals across all samples also failed to reveal any significant sources of strain.

Examination of the loadings of the one-factor solution indicated acceptable magnitudes and significant loadings on the one factor for all items as well as a similar pattern of loadings across samples. Loadings fell within the moderate to strong range, with the strongest loading associated with Item 19 in Sample 1 (*I am not at all afraid to die*; .84) and most modest loading associated with Item 11 in Sample 2 (*It does not make me nervous when people talk about death;* .39). There were no negative residual variances in any sample (see Table 1).

Taken together, results support the viability of the proposed one-factor solution modeling a sense of fearlessness about death. All items included appear to be reasonable indicators of the factor, with most loadings falling in the moderate-to-strong range.

Aim 2: Reliability and Generalizability

In this section, multiple group analyses were used to evaluate the generalizability of the measurement model across gender. Although we anticipated the measurement model of the ACSS-FAD to be generalizable across males and females, we expected that males would evidence higher mean levels of fearlessness about death than females, as empirical evidence suggests that females experience greater fear of death than males (Ellis & Lamis, 2007; McLaren, 2011).

Method

We approached this aim by examining the measurement equivalence and population heterogeneity of the model in Sample 3 (see above for sample description). After examining the viability of the model separately in both groups, tests of equal form, equal factor loadings, equal indicator intercepts, and equal latent means were considered in a sequential fashion. Yuan-Bentler scaled chi-squares were used in chi-square difference testing with a non-significant increase indicating support for equivalence. Results are summarized in Table 2.

Results

Single Group CFAs—We first examined the model separately in males (n = 322) and females (n = 406). In males, SRMR indicated good fit and RMSEA and CFI indicated adequate fit. The remaining fit indices were marginal. In females, with the exception of chi-square, fit indices suggested that the model provided a good fit to the data. In both groups, all factor loadings were statistically significant and standardized loadings ranged from .44 (Item 14, *I am not disturbed by death being the end of life as I know it*) to .84 (Item 10: *I am very much afraid to die (R)*) in males and .52 (Item 14) to .83 (Item 19: *I am not at all afraid to die*) in females (see Table S5).

Equivalent Factor Structure—Tests of equal form involve the analysis of whether the factor structure of the ACSS-FAD (i.e. number of factors and pattern of loadings) is equivalent across groups. Scale dependency for the factor loadings was handled by fixing the loading of Item 10 to 1.0 for all group analyses. When the same factor structure was specified for both groups simultaneously, results indicate adequate-to-good overall fit with the exception of chi-square, supporting equivalent factor structure in populations of males and females (see Table 2).

Equivalent Factor Loadings—As equivalent factor structure was established, we advanced to testing the equivalence of the factor loadings for males and females. The analysis specifying equivalent factor loadings failed to significantly reduce model fit, as evidenced by a non-significant result of the YB chi-square difference test (YB χ^2diff = 7.96, Δdf=6, *ns*) when compared to the baseline model (i.e. the equivalent factor structure model), providing evidence for equivalent factor loadings across gender (see Table 2).

Equivalent Indicator Intercepts—Insofar as males and females evidence equivalent loadings and intercepts, observed scores on an indicator at a given level of a latent factor would be equivalent across groups. Our analyses failed to support intercept equivalence, suggesting that one or more parameters were not equivalent across groups. This was evidenced by a significant change in the YB chi-square difference test (YB χ^2_{diff} = 28.47, Δdf=6, p<.001). Examination of the intercepts across groups revealed that indicator intercepts were consistently higher in males versus females, suggesting males exhibit higher observed scores than females at any given level of the latent factor. Modification indices indicated a significant modification index for Item 8 (*The pain involved in death frightens me, (R)*; MI = 20.83; EPC = .21). The data were reanalyzed allowing Item 8 to be freely estimated in both groups. Results supported partial measurement invariance with a non-significant change in the YB chi-square difference test (YB χ^2_{diff} = 5.23, Δdf=5, *ns*). See Table 2.

Equivalent Latent Means: With full measurement equivalence established for the ACSS-FAD loadings and partial measurement equivalence established for the scale's intercepts, we then examined the equivalence of latent means to determine whether males and females differed in levels of the underlying construct. As expected, constraining factor means to be equivalent significantly degraded the fit of the model (YB χ^2_{diff} = 32.67, Δdf=1, p<.05; see

Table 2). As expected, females exhibit lower fearlessness about death than males with an unstandardized parameter estimate for the latent mean falling .43 units below that of males.

Taken together, results of multiple-group analyses provided some evidence for the generalizability of the ACSS-FAD model. Results suggest that across males and females the fearlessness about death factor has an equivalent latent factor structure and factor loadings, supporting the appropriateness of the measurement model in both groups. Results failed to support full measurement equivalence of the indicator intercepts; however, once item 8 was freely estimated, partial measurement equivalence was obtained. Comparison of latent means indicated that on average females score lower on the underlying dimension of fearlessness about death than males, which is consistent with the interpersonal theory.

Aim 3: Convergent and Discriminant Validity

In this section, we examine the convergent and discriminant validity of the measurement model. To this end, we conducted a set of structural equation models regressing relevant outcome variables on the fearlessness about death measurement model in two independent samples (Sample 2; Sample 4). We also include preliminary convergent and discriminant validity analyses of the scale in a psychiatric inpatient sample (Sample 5).

With respect to convergent validity, we examined the relations between fearlessness about death and constructs expected to be similar in nature, implicated in its development, or relevant to its proposed role in suicidal behavior, as specified by the interpersonal theory. As exposure to painful and provocative experiences contributes to the development of acquired capability for suicide, fearlessness about death should be related to painful and provocative events. We test this relation among young adults (Sample 2; Sample 4) and anticipate a relationship of modest-to-moderate magnitude. Directly relevant to the nature of fearlessness about death, we anticipate a moderate relation with self-perceived courage to attempt suicide (Sample 5) and moderate, negative relationship with self-perceived fear of suicide (Sample 2; Sample 5). As pain tolerance is another component of the acquired capability, we also examined the relationship between fearlessness about death and pain-related variables. We anticipated positive associations with behaviorally assessed pain threshold (Sample 4) and tolerance (Sample 2) as well as the self-reported ability to withstand physical discomfort (Sample 4). By contrast, we expected negative associations with fear of pain (Sample 4). Dispositional factors that might facilitate or hinder the development of acquired capability should also be related to fearlessness about death. Evidence indicates that stoicism may be relevant to the pain tolerance aspect of the acquired capability (Witte et al., 2012); therefore, we expect a modest-to-moderate association with fearlessness about death (Sample 4) by function of being related to the same underlying construct of acquired capability. Further, given that individuals who are more afraid of the physical symptoms of anxiety may be less likely to approach painful and fearsome stimuli, we anticipate a moderate negative association between fear of physical aspects of anxiety and fearlessness about death (Sample 5). Lastly, because the interpersonal theory suggests fearlessness about death is implicated in the development of suicidal intent, we anticipated suicidal intent would have a modest-to-moderate relationship with fearlessness about death (Sample 5).

With respect to discriminant validity, across all three samples, we considered the relationships between fearlessness about death and two outcome variables: depression severity and suicidal ideation. Considering these variables through the lens of the theory, very modest relationships (if any) with fearlessness about death would be expected. Although the interaction of acquired capability and suicidal desire is thought to result in suicidal behavior, the constructs are distinct – that is, suicidal ideation is distinct from acquired capability. As fearlessness about death is a component of the acquired capability, it should also be differentiable from suicidal ideation. Similarly, fearlessness about death should also be distinguishable from depressive symptomatology, despite the fact that thinking about death is a symptom of depression.

Participants and Procedures

Sample 2—See description provided above.

Sample 4—A total of 193 undergraduates (69.4% female) with a mean age of 19.26 (SD = 2.36; range: 19–42) participated in a study examining personality and pain perception. Approximately 83.3% were Caucasian, 16.7% Black, 4.1% Asian/Asian-American, 2.1% Pacific Islander/Native Hawaiian, and 1.0% American Indian/Alaska Native. About 14% were also of Hispanic/Latino ethnicity. Participants completed a self-report battery assessing a range of mental health and individual difference variables. Thermal pain threshold was obtained using a NeuroSensory Analyzer. Task order was counterbalanced. As in Sample 2, participants were right-handed non-smokers abstaining from analgesics, alcohol and sugary foods.

Sample 5—This sample included 67 psychiatric inpatients (41.8% female) with a mean age of 34.04 (SD = 11.65; range: 18–62) receiving acute inpatient services at a community psychiatric hospital and participating in a study designed to examine acute risk factors for suicide. About 54.5% of the sample was Caucasian, 37.9% Black, 1.5% Asian, 1.5% Native Hawaiian/Pacific-Islander, 4.5% American Indian, and 1.5% failed to report race; 21.2% endorsed being Hispanic or Latino. Participants completed a randomly-ordered battery of questionnaires assessing mental health symptoms and individual difference variables.

Measures

Acquired Capability for Suicide Scale – Fearlessness About Death—See description provided in Aim 1. Coefficient alpha for Sample 4 was .85 and for Sample 5 was .81. The mean item response score for Sample 4 was 1.89 and for Sample 5 was 2.24, which was consistent with the previous three young adult samples.

Painful and Provocative Events Scale (PPES; Van Orden et al., 2008)—The PPES is a 25-item measure designed to assess lifetime exposure to painful and provocative events. Each item is scored on a (1) *never* to (5) *regularly* with higher total scores indicating greater exposure. Coefficient alphas were .89 in Sample 2 and .56 in Sample 4[3].

[3]Of note, the lower alpha value is not uncommon, given that the items included in a life events measure are largely independent events.

Pain Threshold—The NeuroSensory Analyzer (TSA-II, Medoc, Durham, NC) assesses thermal pain threshold associated. For Sample 4, heat-induced pain was used. The thermode was placed on the index and middle fingers of the right hand. For each trial, participants were instructed to press a computer mouse button when pain was first perceived. Four trials were completed with 30 seconds between each trial to prevent habituation. Each trial was used as an indicator of the pain threshold latent variable. Coefficient alpha in Sample 4 was . 98.

Pain Tolerance—Pain tolerance assessments were obtained for Sample 2 using a pressure algometer, which was applied perpendicularly to the skin at the first dorsal interosseous muscle of the participant's right hand. The instrument was lowered at a rate of 5 kilopascals per second. Participants were instructed to say “stop” when the pain became too intense to tolerate at which point the algometer was immediately retracted. There were 90s interval periods between all pain tolerance measurements to prevent habituation. Five trials were completed, each of which was used as an indicator of the pain tolerance latent variable. Coefficient alpha in Sample 2 was .97.

Liverpool Stoicism Scale (LSS; Wagstaff & Rowledge, 1995)—The LSS is a self-report scale consisting of 20 items designed to measure stoicism (i.e., lack of emotional involvement, dislike of free emotional expression, ability to endure emotion). Each item is scored on a 5-point likert scale ranging from (1) strongly disagree to (5) strongly agree. Higher scores on the LSS indicate greater levels of stoicism. The scale has good evidence of adequate reliability and validity. The LSS was administered to Sample 4 and evidenced adequate alpha (α = .88).

Suicide Intent Scale (SIS; Beck, Schuyler, & Herman, 1974)—The SIS is a 15-item self-report measure assessing intent preceding most lethal suicide attempts. Each item is rated on a likert scale ranging from 0 to 2. Four SIS items were administered to Sample 5: *How certain were you that what you had done would be fatal?; How certain were you that the method you had chosen would be lethal?; What was your intent to die?;* and *To what extent did you believe that what you had done could be fixed with medical attention?*. Higher total scores reflect greater levels of intent. These four items evidenced strong internal consistency in Sample 5 (α=.94).

Reasons for Living Inventory – Fear of Suicide Subscale (RFL – Fear of Suicide; Linehan et al., 1983)—The Reasons for Living Inventory consists of 48 self-report items assessing reasons for not dying my suicide. Responses use a 6-point Likert scale ranging from (1) extremely unimportant to (6) extremely important with higher scores indicating a stronger reason for living. The RFL in its entirety and its six subscales have evidenced sound psychometric properties in past research. The Fear of Suicide subscale, which consists of seven items, was used in Samples 2 (α=.82) and 5 (α=.84).

Fear of Pain Questionnaire (FPQ; McNeil & Rainwater, 1998)—The FPQ is a 30-item measure designed to assess three facets of fear related to pain. The FPQ consists of three subscales tapping fear associated with severe, minor, and medical pain. The scale has been shown to have good reliability and validity evidence in past research. In Sample 4,

coefficient alpha of the total (α=.97), severe pain subscale (α=.94), minor pain subscale (α=.93), and medical pain subscale (α=.92) all supported the scale's excellent internal consistency.

Discomfort Intolerance Scale (DIS; Schmidt, Richey, Fitzpatrick, Cromer, & Buckner 2006)—The DIS is a brief measure comprised of seven items designed to tap the degree to which an individual is able to tolerate pain and physical discomfort. Using a 7-point Likert scale, respondents are asked to indicate how much they identify with each statement with responses ranging from (0) not at all like me to (6) very much like me. The scale has demonstrated adequate psychometric properties in other research. Higher scores indicate a greater ability to withstand pain and physical discomfort. The DIS was used in Sample 4 (α=.68).

Anxiety Sensitivity Index – Physical Concerns subscale (ASI – Physical Concerns; Reiss et al., 1986)—The ASI is a 16-item self-report questionnaire assessing concerns about anxiety symptoms. Items are rated on a 5-point Likert-type scale with responses ranging from (0) very little to (4) very much. The scale has demonstrated good reliability and validity in past research. The physical concerns subscale, which is designed to measure fear associated with presence or consequences of physical anxiety sensations, was used in Sample 5 (α=.90).

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996)—The BDI-II is a widely used 21-item self-report inventory designed to assess the severity of depressive symptoms within the past two weeks. Severity is assessed on a 4-point Likert-type scale ranging from 0 to 3. Higher scores indicate greater severity. It has demonstrated strong psychometric properties and construct validity in past research (Beck, Steer & Ranieri, 1996). The inventory had high internal consistency in these samples (Sample 2: α=.89; Sample 4: α=.92; Sample 5: α=.91).

Beck Scale for Suicidal Ideation (BSS; Beck & Steer, 1999)—The BSS is a 21-item scale used to assess suicidal ideation and intent over the past week. Responses are scored using a 3-point Likert-type scale where responses range from 0 to 2 with higher values representing higher levels of risk. The BSS has demonstrated good reliability and validity as a measure of suicidality (Beck, Steer, & Ranieri, 2001). The BSS administered to Samples 2, 4, and 5 and internal consistency was adequate (Sample 2: α=.79; Sample 4: α=.88; Sample 5: α=.87).

Depression Symptom Inventory – Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997)—The DSI-SS is a four-item scale designed to measure the frequency and intensity of suicidal ideation symptoms over the past two weeks. Scores on each item range from 0–3 with higher scores indicating more severe suicidal ideation. It has demonstrated good psychometric properties in previous research. In Sample 5, it evidenced good internal consistency (α = .92).

Results

Sample 2 Analyses—Using structural equation model with MLR, the pain tolerance latent and 4 observed indicators were regressed on the ACSS-FAD, controlling for gender. With the exception of YB χ^2 value (YB $\chi^2(103)=199.72$, $p<.001$), fit indices supported adequate-to-good model fit (RMSEA=.07 [90% CI: .06, .08]; CFI=.94; TLI=.92; SRMR=.05). As anticipated, findings indicated a modest-to-moderate relationship between fearlessness about death and pain tolerance (β=.23, p<.001). Analyses also revealed a moderate negative relationship (β=−.45, p<.001) with fear of suicide as a reason for living (RFL-Fear of Suicide). Exposure to painful and provocative events (PPES) failed to evidence a significant relationship with fearlessness about death beyond the effect of gender (β=−.01, p=.89), which was contrary to prediction. As expected, the ACSS-FAD did not evidence a significant relationship with either depression (BDI: β= −.03, p=.71) or suicidal ideation (BSS: β=−.01, p=.90). See Figure 1.

Sample 4 Analyses—A structural equation model using MLR examined the relationship between the fearlessness about death factor (ACSS-FAD) and nine outcome variables, controlling for gender. The pain threshold latent variable and eight observed variables were regressed onto the fearlessness about death latent variable. An RMSEA of .06 (90% CI: .04, .07), CFI of .96, TLI of .93 and SRMR of .04 supported good model fit, with the exception of the significant YB chi-square (YB $\chi^2(124)=211.86$, $p<.001$). As predicted, fearlessness about death demonstrated modest relationships with the ability to tolerate physical discomfort (DIS: β=.22, p=.008) and stoicism (LSS: β=.14, p=.03). Fearlessness about death also had moderate negative relationships with fear of severe pain (β=−.34, p<.001), medical pain (β=−.34, p<.001), and minor pain (β=−.24, p=.007). As anticipated, fearlessness about death was not significantly related to depressive symptoms (BDI: β=−.10, p=.25) or suicidal ideation (BSS: β=.07, p=.25). Counter to our predictions, neither pain threshold (β=−.09, p=.25) nor exposure to painful or provocative events (PPES: β=.12, p=.16) was significantly related to fearlessness about death, controlling for gender. See Figure 2.

Sample 5 Analyses—Pearson product-moment correlations were used to examine the convergent and discriminant validity of the scale in psychiatric inpatients. As anticipated, ACSS-FAD total scores demonstrated a strong correlation with perceived courage to make an attempt (BSS-item 14: $r=.67$, $p<.001$) and, among individuals with a history of suicide attempts (i.e., 52.2% of the sample), a moderate correlation with suicidal intent at most lethal attempt ($r=.37$, $p<.001$). Further, ACSS-FAD total scores had a strong negative correlation with fear of suicide (RFL-Fear of Suicide: r=−.51, p<.001) and a moderate negative correlation with fears of physical anxiety sensations (ASI-Physical Concerns: r=−.40, p=.001). As expected, we found no significant association between depressive symptoms and ACSS-FAD total scores (BDI: r=.05, p=.68). Results also indicated no significant association with suicidal ideation as measured by the DSI-SS (r=.20, p=.11) and only a modest association when measured by the BSS (r = .27, p=.03)[4].

[4]Partialing out attempt status, the association between BSS and ACSS-FAD total scores was not significant (partial r=.20, p=.15).

Discussion

The interpersonal theory of suicide suggests the acquired capability for suicide in part explains what differentiates individuals who desire suicide from those who act on that desire. A comprehensive review of the literature on acquired capability, however, revealed a number of factors that underscored a need to reevaluate the primary self-report measure (i.e., ACSS) used to assess the construct. The purpose of the current project was to propose a revision to the scale. Findings support the viability of a revised form termed the ACSS-Fearlessness About Death scale.

The first aim of this project was to develop a viable latent variable measurement model of the scale that was consistent with the current theoretical conceptualization of the construct. To this end, results from CFA techniques supported a viable one-factor model consisting of seven items characterized by a sense of fearlessness about death and replicated with adequate model fit across four independent samples. The indicators demonstrated consistently solid loadings and comparable patterning across samples. Although the fearlessness about death measurement model is promising, there is a need to bolster the self-report measurement of the second outcome associated with acquired capability: elevated pain tolerance. Review of the original ACSS failed to identify sufficient viable items measuring pain tolerance. Future iterations of the scale should look to include a broader representation of items that may reflect heightened pain tolerance. It is also interesting to consider whether examining fearlessness about one's own death in particular (versus fearlessness about death generally) may relate to acquired capability and eventual death by suicide. Although Van Orden and colleagues (2010) implicate fearlessness about death generally, it is 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.

The second aim was to examine the measurement invariance of the model in men versus women. Results supported the generalizability of the model across gender. Although we did not establish full measurement invariance with respect to indicator intercepts, we established partial invariance when Item 8 (*The pain involved in death frightens me*) was freely estimated in both groups. This suggests that Item 8 may function differently in men and women, such that men may have higher observed scores on this item than women at equivalent latent levels of fearlessness about death. As anticipated, males and females differed significantly on latent levels of fearlessness about death with females demonstrating lower levels of the construct. Future research should examine whether differences in indicator intercepts hold when examined in other groups, such as older adults, where rates of suicide differ even more between men and women.

Considering the issue of generalizability further, future work is needed to ensure the factor structure of fearlessness about death is similar in high-risk groups. Although we provide preliminary evidence for the viability of the measure in an inpatient sample, we were unable to perform a multiple group CFA given the small size of the inpatient sample. Based on the theoretical conceptualization of the construct, the factor structure of fearlessness about death should hold in high risk groups. Future studies with samples varying in age are also needed to examine the latent structure of fearlessness about death across the lifespan. It is possible

that some items may function differently among older adults or those with life-threatening illness, as the meaning of death ideation with regards to suicide risk is not well understood in these populations. In all, future research using more heterogeneous samples with respect to nationality, culture, socioeconomic status, age, and symptom severity is necessary.

The third aim of the current research was to examine whether the measurement model was substantively related to the construct of the fearlessness about death. To this end, we examined the extent to which our measurement model of fearlessness about death related to constructs expected to be similar in nature, implicated in its development, or relevant to its proposed role in suicidal behavior, as specified by the interpersonal theory. We examined these relations across two independent samples of young adults as well as a sample of inpatients, controlling for gender. Across samples, fearlessness about death was associated with fear of suicide as well as self-reported courage to attempt suicide. Fearlessness about death was also related to a number of outcomes associated with pain perception, including self-perceived ability to withstand physical discomfort, fear of physical pain, as well as a behavioral assessment of pain tolerance. Our analyses further revealed that relevant dispositional factors for the development of the acquired capability, such as stoicism and fear of experiencing physical symptoms of anxiety, were related to fearlessness about death. Among inpatients with past attempts, fearlessness about death was associated with severity of suicidal intent during the most severe attempt, which is consistent with Van Orden and colleagues (2010) proposition that the fearlessness about death contributes to the transition from active suicidal desire to the development of frank suicidal intent. Importantly, the measurement model was not significantly associated with depression or suicidal ideation in the young adult samples and was only modestly associated with suicidal ideation in the inpatient sample, which distinguishes fearlessness about death from these constructs and is in line with the theory's predictions.

Two findings were not in line with our expectations. First, we failed to find significant relationship with painful and provocative events after controlling for gender. One possible explanation to consider is whether the events included in the PPES are confounded by gender. Although past research has documented a link between PPES and ACSS, no studies have controlled for gender. It is also possible the PPES fails to comprehensively capture all painful and provocative events; indeed, certain experiences that may be more relevant to females (e.g., painful eating disorder behaviors) are not included in the scale. Further, as there have been no comprehensive psychometric evaluations of the PPES to date, questions remain regarding the appropriateness of the measure in general. A second unexpected finding was that thermal pain threshold failed to demonstrate a significant relationship with the ACSS-FAD; however, this may in part be due to how pain perception was assessed. First, the theory makes specific predictions about pain tolerance – not threshold – as a component of acquired capability. Our result is consistent with at least one prior study (Witte et al., 2012) that did not find a positive association between fearlessness about death and either pressure or thermal pain threshold. Second, thermal pain may also be less relevant to suicidal behavior than pressure pain. Consider, for instance, that methods of suicide that involve pressure pain (e.g., hanging, firearm, vehicle collision) are far more common than self-immolation (Ajdacic-Gross et al., 2008).

Of note, only cross-sectional and retrospective data were used in the Aim 3 analyses. Prospective studies are necessary to examine how fearlessness about death and pain tolerance may interact with suicidal desire to predict future suicidal behavior. Higher levels of fearlessness about death would likely also be associated with a greater likelihood of engaging in more severe forms of suicidal behavior and likely using more lethal or violent means for suicidal behavior.

Limitations notwithstanding, the present findings have important implications for past research using the ACSS. First, as noted above, although past research has demonstrated associations between PPES and acquired capability, our results call those findings into question. Secondly, the present research also further clarifies the relation between fearlessness about death and pain tolerance. Although some past research has conflated elevated pain tolerance with fearlessness about death (e.g., Bender et al., 2011), our findings indicate that the two components of acquired capability are related but differentiable. Based on the present work, fearlessness about death is only modestly associated with pain tolerance. This is consistent with Van Orden and colleagues (2010) argument that the components of acquired capability are differentiable and adds to a growing literature base (e.g., Witte et al., 2012; Witte et al., 2013) supporting the distinction.

Yet, the present results still do not unequivocally discount past research findings. It should be noted that ACSS-FAD items are reflected in total scores of both the full and shortened versions of the ACSS; however, the influence of the other items not selected for the ACSS-FAD on the outcomes is unknown and requires further research attention. Thus, the present research underscores a need for research replicating the findings of past research using the ACSS-FAD and other psychometrically sound indices of fearlessness about death and pain tolerance.

In closing, the findings from this study extend our knowledge of the psychometrics of the ACSS-FAD in particular and the nature of fearlessness about death more generally. Coupled with the growing literature base on the theory, these findings provide further evidence for the construct validity of fearlessness about death, an important consequence of developing the capability for suicide. Identifying a viable latent variable measurement model of fearlessness about death sets the stage for future studies to further our understanding of the construct, its relation to acquired capability and suicidal behavior.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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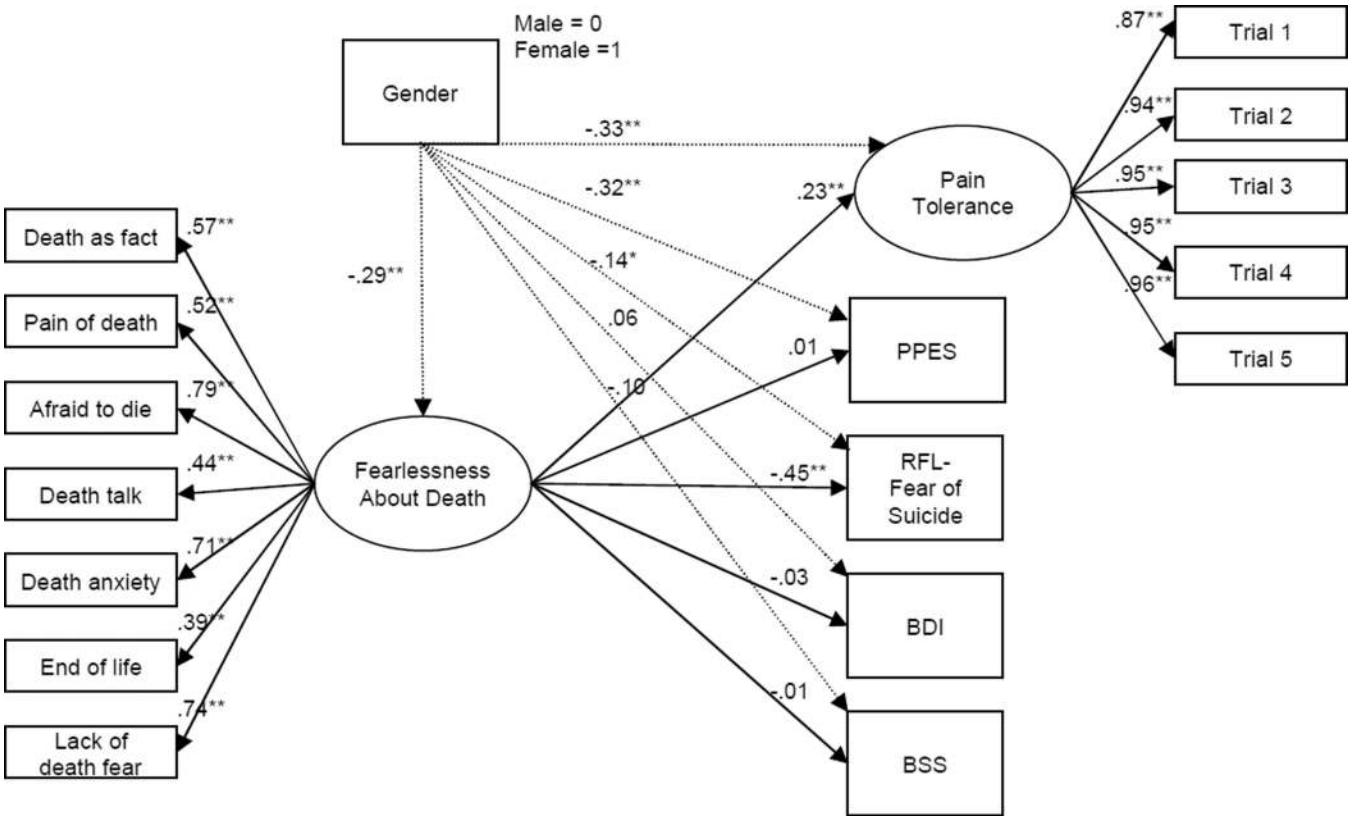

Figure 1.

Convergent and discriminant relationships with fearlessness about death controlling for gender (Sample 2)

Note. PPES=Painful and Provocative Events Scale; RFL-Fear of Suicide=Reasons for Living Inventory – Fear of Suicide subscale; BDI = Beck Depression Inventory; BSS = Beck Scale for Suicidal Ideation; *p < .05; **p<.01

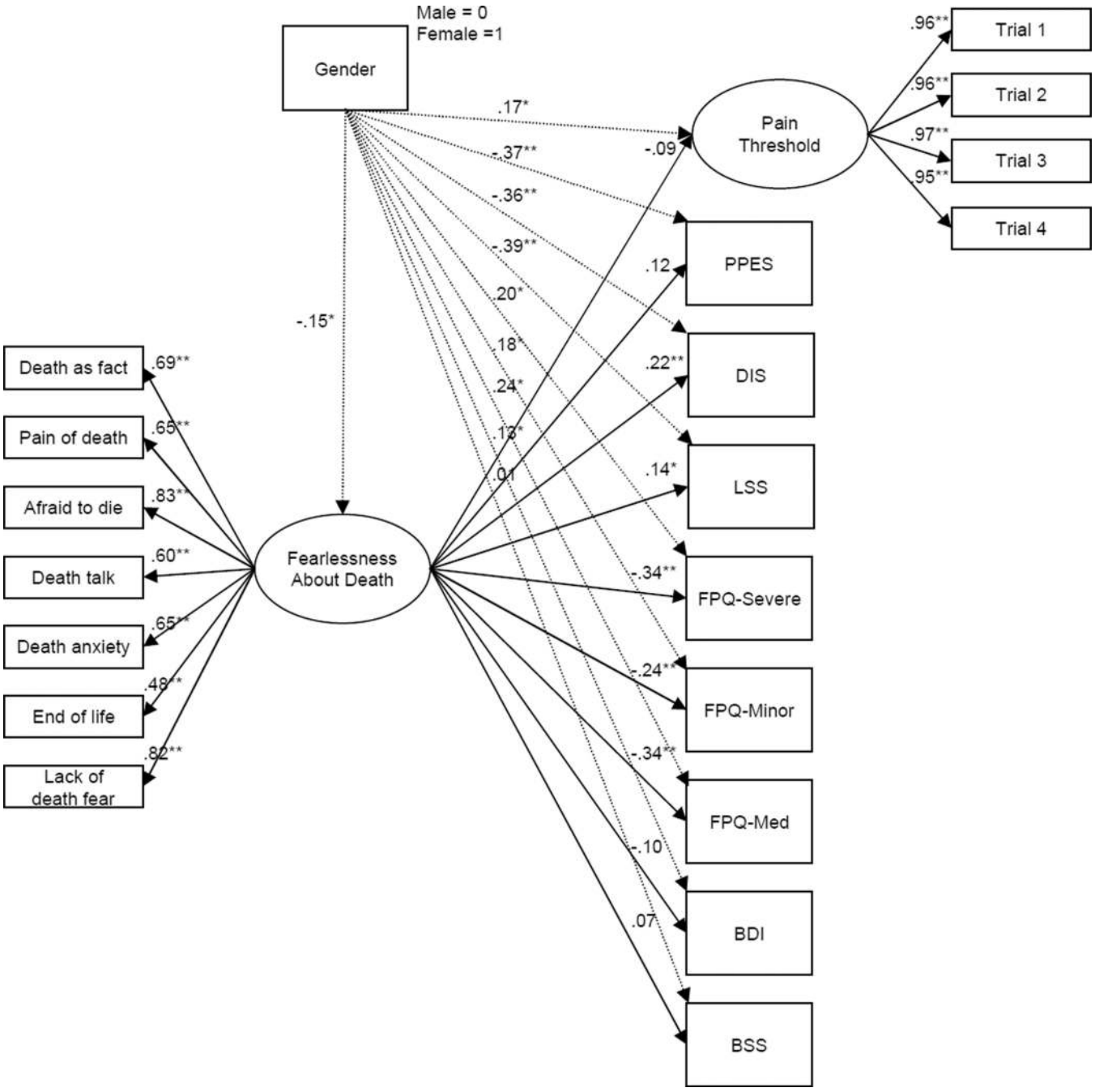

Figure 2.

Convergent and discriminant relationships with fearlessness about death controlling for gender (Sample 4)

Note. PPES = Painful and Provocative Events Scale; DIS = Discomfort Intolerance Scale; LSS = Liverpool Stoicism Scale; FPQ-Severe = Fear of Pain Questionnaire – Severe Pain subscale; FPQ-Minor = Fear of Pain – Minor Pain subscale; FPQ-Med = Fear of Pain – Medical Pain subscale; BDI = Beck Depression Inventory; BSS = Beck Scale for Suicidal Ideation; *p < .05; **p<.01.

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Table 1

Goodness-of-Fit Statistics, Factor Loadings, Standardized Residuals, and Communalities (Samples 1–4)

Goodness-of-Fit		Item	Content	Standardized Loadings			Standardized Residuals			
				Estimate	S.E.	Est./S.E.	Estimate	S.E.	Est./S.E.	h^2
			Sample 1 (n=227)							
YB χ^2, df, p	30.85, 14, .03	ACSS 7	Death as fact	.64	.05	12.41	.59	.07	8.82	.41
SRMR	**.04**	ACSS 8	Pain in dying	.53	.06	8.32	.72	.07	10.44	.29
CFI	**.97**	ACSS 10	Afraid to die	.84	.03	28.52	.29	.05	5.87	.71
TLI	**.96**	ACSS 11	Death talk	.54	.06	8.45	.71	.07	10.29	.29
RMSEA (90% CI)	**.06 (.02, .09)**	ACSS 13	Death anxiety	.66	.04	14.91	.56	.06	9.48	.44
		ACSS 14	End of life	.58	.06	9.91	.67	.07	9.82	.34
		ACSS 19	Lack death fear	.76	.05	16.39	.43	.07	6.16	.57
			Sample 2 (n=257)							
YB χ^2, df, p	41.99, 14, .002	ACSS 7	Death as fact	.57	.06	9.17	1.01	.06	17.72	.32
SRMR	**.05**	ACSS 8	Pain in dying	.49	.07	7.39	1.16	.06	17.97	.24
CFI	**.93**	ACSS 10	Afraid to die	.79	.04	21.06	1.43	.08	17.94	.63
TLI	**.90**	ACSS 11	Death talk	.39	.08	5.18	1.66	.10	17.25	.15
RMSEA (90% CI)	**.08 (.05, .11)**	ACSS 13	Death anxiety	.69	.06	12.10	1.40	.08	17.79	.48
		ACSS 14	End of life	.42	.07	5.76	1.01	.06	17.63	.18
		ACSS 19	Lack death fear	.72	.05	15.91	.96	.05	17.80	.52
			Sample 3 (n=723)							
YB χ^2, df, p	88.65, 14, <.001	ACSS 7	Death as fact	.70	.03	25.67	.51	.04	13.30	.49
SRMR	**.04**	ACSS 8	Pain in dying	.55	.04	15.20	.70	.04	17.53	.30
CFI	**.95**	ACSS 10	Afraid to die	.80	.02	37.18	.36	.04	10.25	.65
TLI	**.92**	ACSS 11	Death talk	.49	.04	12.97	.76	.04	20.07	.24
RMSEA (90% CI)	**.08 (.06, .10)**	ACSS 13	Death anxiety	.63	.03	19.31	.60	.04	14.69	.40
		ACSS 14	End of life	.50	.04	13.28	.75	.04	20.00	.25
		ACSS 19	Lack death fear	.79	.02	41.27	.37	.03	12.21	.63
			Sample 4 (n=193)							
YB χ^2, df, p	**21.67, 14, .21**	ACSS 7	Death as fact	.70	.06	11.64	.53	.08	6.45	.47
SRMR	**.03**	ACSS 8	Pain in dying	.65	.06	11.05	.58	.08	7.67	.42

Goodness-of-Fit		Item	Content	Standardized Loadings			Standardized Residuals			
				Estimate	S.E.	Est./S.E.	Estimate	S.E.	Est./S.E.	h^2
CFI	**.99**	ACSS 10	Afraid to die	.83	.03	24.42	.31	.06	5.56	.69
TLI	**.98**	ACSS 11	Death talk	.60	.06	10.59	.64	.07	9.43	.36
RMSEA (90% CI)	**.04 (.00, .08)**	ACSS 13	Death anxiety	.64	.06	11.22	.59	.07	7.93	.41
		ACSS 14	End of life	.48	.08	6.15	.77	.07	10.50	.23
		ACSS 19	Lack death fear	.82	.04	19.86	.33	.07	4.87	.67

Note. YB χ^2= Yuan-Bentler Scaled Chi-Square; df = degrees of freedom; SRMR = Standardized Root Mean Residual; CFI = Comparative fit index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; Values in bold represent at least adequate model fit. All factor loadings are statistically significant with a cutoff of Est/S.E. = 1.96.

Table 2

Tests of Measurement Invariance and Population Heterogeneity of ACSS in Males and Females (Sample 3)

	χ^2	df	MLR Scaling Factor	YB χ^2_{diff}	Δdf	CFI	TLI	RMSEA	SRMR
Single Group Solutions									
Male	62.86	14	1.15	--	--	.90	.85	.10 (.08, .13)	.05
Female	34.78	14	1.17	--	--	.97	.96	.06 (.04, .09)	.03
Measurement Equivalence									
Equal form	100.19	28	1.13	--	--	.94	.91	.09 (.07, .10)	.04
Equal factor loadings	108.10	34	1.13	7.96	6	.94	.92	.08 (.06, .10)	.05
Equal indicator intercepts	135.64	40	1.11	28.47*	6	.92	.91	.08 (.07, .10)	.06
Partial Measurement Equivalence									
Equal indicator intercepts	114.40	39	1.12	5.23	5	.94	.93	.07 (.06, .09)	.05
Population Heterogeneity									
Equal Latent Means	138.73	40	1.112	32.67*	1	.92	.91	.08 (.07, .10)	.08

Note. χ^2 = Chi-Square; df = degrees of freedom; MLR Scaling Factor = Robust Maximum Likelihood Scaling Factor; YB χ^2= Yuan-Bentler Scaled Chi-Square; SRMR = Standardized Root Mean Residual; CFI = Comparative fit index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation;

*p<.05.