

Please cite the Published Version

Dhingra, KJ, Boduszek, D and O'Connor, R (2015) Differentiating suicide attempters from suicide ideators using the Integrated Motivational-Volitional model of suicidal behaviour. *Journal of Affective Disorders*, 186. pp. 211-218. ISSN 0165-0327

DOI: <https://doi.org/10.1016/j.jad.2015.07.007>

Publisher: Elsevier

Version: Accepted Version

Downloaded from: <https://e-space.mmu.ac.uk/592851/>

Usage rights: © In Copyright

Additional Information: This is an Accepted Manuscript of an article which appeared in final form in *Journal of Affective Disorders*, published by Elsevier

Enquiries:

If you have questions about this document, contact openresearch@mmu.ac.uk. Please include the URL of the record in e-space. If you believe that your, or a third party's rights have been compromised through this document please see our Take Down policy (available from <https://www.mmu.ac.uk/library/using-the-library/policies-and-guidelines>)

**Differentiating Suicide Attempters from Suicide Ideators using the Integrated
Motivational-Volitional Model of Suicidal Behaviour**

Katie Dhingra¹, Daniel Boduszek², Rory C O'Connor³

¹Manchester Metropolitan University, United Kingdom

²University of Huddersfield, Huddersfield, United Kingdom

³University of Glasgow, United Kingdom

Version accepted for publication in Journal of Affective Disorders

Correspondence to:

Dr Katie Dhingra

Manchester Metropolitan University

Brooks Building

53 Bonsall Street

Manchester, M15 6GX

United Kingdom

Tel: +44 (0) 161 247 2593

Email: k.dhingra@mmu.ac.uk

Abstract

Background. Suicidal behaviour is a significant public health concern, yet little is known about the factors that enable or impede behavioural enactment (engaging in a suicide attempt). **Aims.** Drawing on the Integrated Motivational–Volitional (IMV) Model of Suicidal Behaviour (2011), this study examined the factors associated with having thoughts of suicide (ideation) versus those associated with suicide enactment (attempts). Within a multivariate context, it was predicted that the factors associated with ideation formation (motivational factors) would be distinct from those factors which governed behavioural enactment (volitional moderators). **Method.** Healthy adults ($N = 1,288$) completed an anonymous self-report survey. Analyses compared three groups: suicide attempters ($n = 230$), suicide ideators ($n = 583$), and those without any suicide history ($n = 475$). **Results.** Suicide attempters differed from suicide ideators on all volitional factors (fearlessness about death, impulsivity, and exposure to suicidal behaviour), with the exception of discomfort tolerance. Compared to ideators, attempters were more likely to have a family member and close friend who had self-injured or attempted suicide, and were more impulsive and fearless about death. Conversely, the two suicide groups did not differ on any of the variables (motivational factors) associated with the development of thoughts of death by suicide. **Limitations.** This is a cross-sectional study based on self-report measures. **Conclusions.** Further research efforts to distinguish between suicide ideators and suicide attempters is crucial to inform the development of intervention and treatment approaches.

Keywords: Suicide; Integrated Motivational–Volitional Model (IMV); Theoretical

Introduction

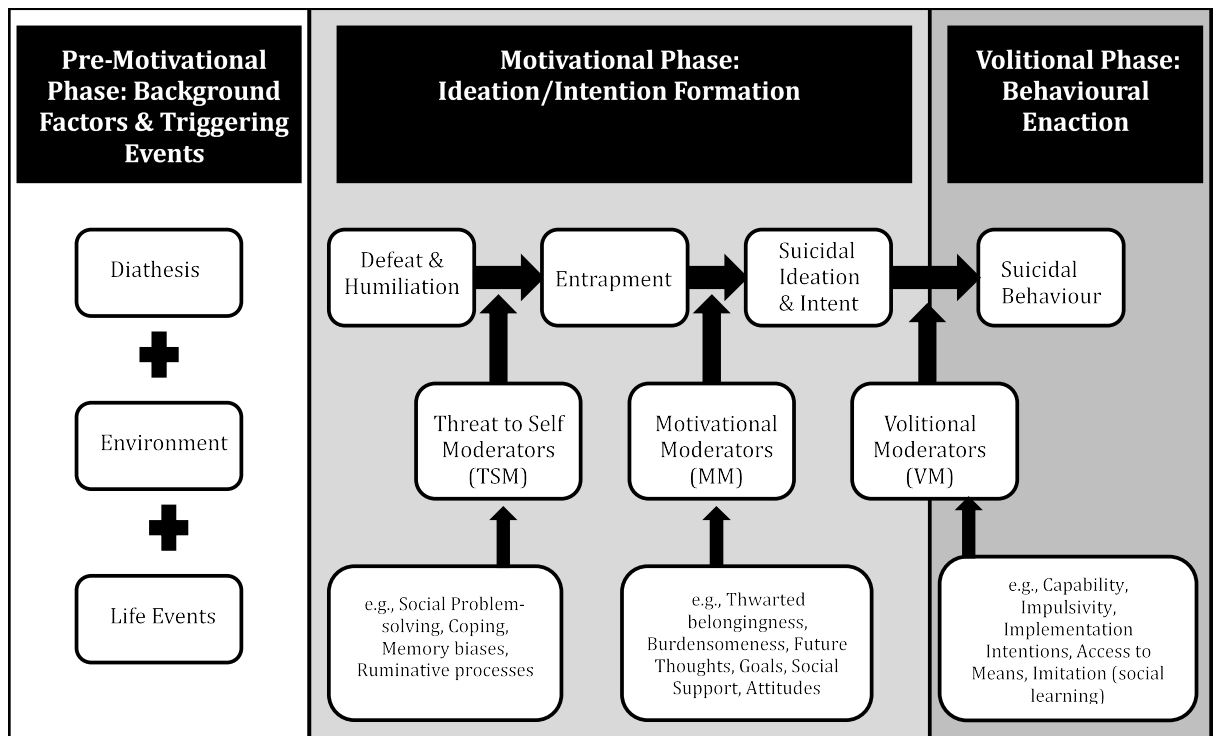
Approximately 804,000 people worldwide die by suicide each year (World Health Organization, 2014), making it one of the leading causes of death. Indeed, suicide accounts for more deaths each year than all wars and other forms of interpersonal violence combined—meaning that we are more likely to die by our own hand than by someone else’s (World Health Organisation, 2012). A history of suicidal behaviour is one of the most robust predictors of future suicide (Hawton & van Heeringen, 2009). Despite increased prevention efforts, based on current trends, by the year 2020, the number of deaths due to suicide is expected to reach nearly 1.53 million around the world. One reason for the limited progress in suicide prevention may be a lack of knowledge about the factors that determine when suicide ideation is translated into suicidal actions (Klonsky & May, 2014; O’Connor & Nock, 2014).

Although the majority of individuals who consider death by suicide do not make suicide attempts (Kessler, Borges, & Walters, 1999), for the most part, research that has examined the predictors of suicidal behaviour has failed to identify which suicide ideators are at greatest risk of acting on their thoughts (i.e., attempting suicide). This is problematic as recent research has shown that some of the strongest risk factors for suicide attempts (e.g., mental disorders and hopelessness) are less useful in predicting which people with suicide ideation go on to make suicide plans and attempts (Nock, Hwang, & Sampson et al., 2009; Nock, Hwang, Sampson, & Kessler, 2010). A lack of fine-grained analysis is surprising, as such an approach has proven useful in other areas, such as the study of alcohol use, where, for instance, the factors that predict ever drinking, differ from those that predict high-risk and problem drinking among drinkers, which in turn are different from predictors of alcohol dependence among problem drinkers (Danielsson, Wennberg, Tengström, & Romelsjö, 2010; Power, Stewart, Hughes, & Arona, 2005). Understanding this kind of specificity in relation to

suicidal behaviour may help in the development of more effective interventions. Indeed, Klonsky and May (2014) argued that an “ideation-to-action” framework should guide all suicide theory, research, and prevention.

The Integrated Motivational–Volitional (IMV; Figure 1) Model of suicidal behaviour (O’Connor, 2011) attempts to address this very issue. It provides a theoretical basis for examining the factors associated with the development of suicidal ideation and the translation of these thoughts into suicidal behaviour. It integrates predominant factors from existing models including Williams’ arrested flight model (Williams, 2001), the diathesis-stress hypothesis (Schotte & Clum, 1987), and the theory of planned behaviour (Ajzen, 1991). The IMV conceptualises suicide as behaviour (rather than a by-product of mental disorders) that results from a complex interplay of factors, the proximal predictor of which is one’s intention to engage in suicidal behaviour. Intention, in turn, is determined by feelings of entrapment where suicidal behaviour is seen as the salient solution to life circumstances, and entrapment is triggered by defeat/humiliation appraisals. The transitions from the defeat/humiliation stage to entrapment, from entrapment to suicidal ideation/intent, and from ideation/intent to suicidal behaviour are determined by stage-specific moderators (i.e., factors that facilitate/obstruct movement between stages), entitled threat-to-self (e.g., ruminative processes and memory biases), motivational (e.g. thwarted belongingness, burdensomeness, and goals), and volitional (e.g., exposure to the suicidal behaviour of others and impulsivity) moderators, respectively. In addition, background factors (e.g., personality and individual difference variables), which comprise the pre-motivational phase (i.e., before the commencement of ideation formation), provide the broader biosocial context for suicide. A key premise of the model is that the factors and processes underpinning the development of thoughts of suicide are different from those associated with engaging in suicidal behaviour.

Figure 1. Integrated Motivational –Volitional Model of Suicidal Behaviour (O’Connor, 2011)



Although the IMV model is relatively new, there is growing empirical evidence to support its utility in understanding both suicidal behaviour and self-harm (self-injurious behaviour irrespective of intent). For instance, in a large sample of adolescents ($N = 5,604$), as predicted by the IMV, pre-motivational phase and motivational phase variables (i.e., socially prescribed perfectionism, self-esteem, brooding rumination and optimism) did not distinguish between adolescents who only thought about self-harm (i.e., ideators only) and those who actually engaged in self-harm (i.e., enactors); whereas, the volitional phase variables (i.e., self-harm by family, self-harm by friends, descriptive norms and impulsivity) did (O’Connor, Rasmussen, & Hawton, 2011). In another study, defeat and entrapment were found to be univariate predictors of suicide attempts four years after an index suicide attempt, along with other established predictors of suicidal behaviour (i.e., depression, suicide ideation, hopelessness, and past suicide attempts). Importantly though, in multivariate analysis, only entrapment and past suicide attempts emerged as significant predictors (O’Connor, Smyth, Ferguson, Ryan & Williams, 2013). Consistent with the IMV, how

individuals respond to unachievable goals (reengagement *vs.* disengagement) has also been found to predict repetition of self-harm/suicide (O'Connor, Ryan, O'Carroll, & Smyth, 2012, O'Connor et al., 2009).

Other research findings are also in line with the IMV's contention that pre-motivational/motivational and volitional phase variables should differentially predict suicidal ideation and behaviour. Séguin, Lynch, Labelle, and Gagnon (2004) did not find significant differences between adolescents who attempted suicide ($n = 24$) from those who only experienced suicidal ideation ($n = 50$) on measures of depression, self-esteem, irrational beliefs, reasons for living, parent-child relationships, or family functioning. Taliaferro and Muehlenkamp (2013), using data from the 2010 Minnesota Student Survey, found that hopelessness and depression were higher among adolescent ideators compared with non-suicidal adolescents, but comparable between ideators and attempters; conversely, a self-injury history (a volitional phase factor) was more likely among attempters than ideators. There is also emerging evidence that suicide capability is elevated among suicide attempters relative to suicide ideators (Smith, Cukrowicz, Poindexter, Hobson, & Cohen, 2010; Van Orden, Witte, Gordon, Bender, & Joiner, 2008), and that restricted physical access to lethal means may reduce the likelihood of suicide attempts (Baber & Miller, 2014).

The current study

The aim of the present research, therefore, is to test theory-driven hypotheses about the factors associated with the development of suicidal thoughts *vs.* those associated with acting on such thoughts. Based on the central tenets of the IMV, within multivariate analyses it is predicted that (a) suicide ideators and attempters would differ significantly from controls on the motivational phase measures (brooding rumination, perceived burdensomeness, thwarted belongingness, goal disengagement, goal re-engagement, defeat, and entrapment), but there would be no differences between ideators and attempters on these measures; and (b) suicide

ideators and attempters would differ from controls on the volitional phase measures (having family members and friends who have self-injured or attempted suicide in the past, impulsivity, and fearlessness about death), but ideators would also differ from attempters on these measures. The measures included in this study were selected as they assess factors explicitly described in the IMV model (O'Connor, 2011).

Method

Sample

Participants were 960 female and 328 male university students recruited from various faculties in three UK universities ($N = 1288$). Participants were aged between 18 and 63 years ($M = 24.29$; $SD = 8.30$). Most students identified themselves as White (80.9%), were currently in a relationship (52.3%), and described their sexual orientation as heterosexual/straight (83.3%).

Measures

Motivational Phase Variables

Perceived burdensomeness and thwarted belongingness. Perceived burdensomeness and thwarted belongingness were measured with the 12-item version of the Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2008). The INQ assesses respondent's current beliefs about feeling connected to others (i.e., thwarted belongingness; e.g., "I feel disconnected from other people") and feeling like a burden on the people in their lives (i.e., perceived burdensomeness; e.g., "The people in my life would be better off if I were gone"). Seven items measure belongingness, and five items measure burdensomeness. Items are rated on a Likert-type scale ranging from 1 ("not at all true of me") to 7 ("very true for me"), with higher scores reflecting higher levels of thwarted belongingness and burdensomeness. Internal consistency coefficients were found to be very good for both the burdensomeness items ($\alpha = .93$) and the belongingness items ($\alpha = .86$) in this study.

Brooding rumination. Brooding, defined as the extent to which individuals passively focus on the reasons for their distress (e.g., "Think, 'Why can't I handle things better?'"), was measured using the five items from the Response Styles Questionnaire (RSQ; Nolen-Hoeksema, 1991). Cronbach's α was .78

Defeat. Defeat was measured by the Defeat Scale, a self-report measure of 16 questions assessing individuals' perceptions of losing rank position and failed struggle during the past seven days (e.g., "I feel defeated by life") (Gilbert & Allan, 1998). Items are rated on a five-point scale; higher scores indicate feelings of more defeat. Cronbach's α was .95.

Entrapment. The Entrapment Scale is a self-report measure of 16 questions that assess motivation to escape (e.g., "I am in a situation I feel trapped in") (Gilbert & Allan, 1998). Items are rated on a five-point scale; higher scores indicate more feelings of entrapment. Cronbach's α was .96.

Goal Reengagement and Disengagement. The goal adjustment scale (GAS; Wrosch, Scheier, & Miller et al., 2003) is a 10-item instrument that consists of two subscales: (i) goal disengagement (4 items) and, (ii) goal reengagement (6 items). Goal disengagement measures one's perceived difficulty in reducing effort and relinquishing commitment toward unobtainable goals (e.g., "It's easy for me to reduce my effort toward the goal" [reverse scored]). The goal reengagement subscale taps one's perceived ability to reengage in other new goals if they face constraints on goal pursuits (e.g., "I think about other new goals to pursue"). Both subscales were internally consistent (Cronbach's $\alpha = .91$ and $.82$ for reengagement and disengagement, respectively).

Volitional Phase Variables

Fearlessness about Death. The Acquired Capability for Suicide Scale (ACSS; Van Orden, Witte, Gordon, Bender, & Joiner, 2008) was originally developed as a 20-item self-report measure to assess both fearlessness about death (FAD) and pain insensitivity. However, a recent psychometric investigation of the ACSS supports the use of a 7-item subscale of the ACSS to assess FAD (e.g., "I am very much afraid to die") (ACSS-FAD; Ribeiro, Witte, & Van Orden et al., 2014). In the current study, the ACSS-FAD subscale was utilised as a

measure of FAD. Items were rated on a 5-point scale, with higher scores indicating greater FAD. Internal consistency in the current sample was adequate ($\alpha = .83$).

Discomfort Tolerance. The Discomfort Intolerance Scale (DIS; Schmidt, Richet, Cromer, & Buckner, 2007) is a five-item self-report index of the degree to which individuals tolerate physical discomfort, including pain (e.g., “I can tolerate a great deal of physical discomfort [reverse scored]”). Participants rate items on a scale ranging from 0 (“not at all like me”) to 6 (“extremely like me”). In this sample, alpha was .73.

Exposure to suicidal behaviour. Respondents were asked the following two questions about self-harm by close friends and family: ‘Has anyone among your close friends [your family] attempted suicide or deliberately harmed themselves?’ Items were drawn from research by O’Connor et al., (2012).

Impulsivity. Two items (“I do things on the spur of the moment” and “I do things impulsively”) based on research by O’Connor et al. (2012) were selected from the Plutchik Impulsivity Scale (Plutchick, Praag, Picard et al., 1989) to assess this construct. In this sample, alpha was .61.

Mood and Suicidal ideation and behaviour

Anxiety and Depression. The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was employed to measure anxiety (e.g., “I feel tense or 'wound up'”) and depression (e.g., “I feel as if I am slowed down”). It consists of 14 questions, seven each to measure depression and anxiety. Internal consistency (Cronbach's α) for depression and anxiety was .83 and .83, respectively.

Suicidal ideation and behaviour. Suicide attempts were recorded if a respondent answered ‘yes’ (labelled suicide attempt) to the following question taken from The Self-Injurious

Thoughts and Behaviors Interview (SITBI; Nock, Holmberg, Photos, & Michel, 2007):

“Have you ever made an actual attempt to kill yourself in which you had at least some intent to die?” Suicide ideation was recorded if a respondent answered ‘yes’ (labelled suicide ideation) to the following question: ‘Have you ever had thoughts of killing yourself?’ and ‘no’ to the suicide attempt question. The ideator group, therefore, is only comprised of individual who had seriously thought about death by suicide and have never acted on these thoughts.

Procedure

The research protocol was reviewed and approved by the institutional ethics panels of all three participating universities. Participants were recruited via an email invite to participate in a study of suicide. Within this email it was made clear to potential participants that they did not need to have experienced suicidal thoughts and behaviours to take part. The study was also advertised on the websites of two of the participating university’s websites. Participants completed the study online using Qualtrics, a Web interface that allows for secure remote data collection through the distribution of anonymous secure links to the protocol.

Participants were required to consent before the survey was presented online. Participation in the current study was voluntary and no inducements or obligations were used. All participants were debriefed and given phone numbers for local mental health services.

Analysis

A series of one-way ANOVAs was conducted to compare the three groups (ideators *vs* enactors *vs* controls) on all continuous scales directly. To control for the number of comparisons we employed the Bonferroni correction method. Following this, hierarchical multinomial logistic regression was used to assess the effect of the predictor variables on group membership (control, ideation, attempts). For this analysis, two regressions were conducted: one with the control group as the reference category, and the other with suicide

ideation as the reference category. In the first block, all demographic variables and mood (age, gender, sexual orientation, relationship status, ethnicity, depression and anxiety) were entered. In the second block, the motivational phase variables (defeat, entrapment, brooding rumination, goal disengagement and reengagement, perceived burdensomeness, and thwarted belongingness) were added. In the final step, the volitional phase variables (discomfort tolerance, fearlessness about death, impulsivity, exposure to self-injurious behaviour by close friends and family members, and impulsivity) were added. Odds ratios (OR) indicate the likelihood of membership in the ideation group (relative to the control group), the suicide attempt group (relative to the control group), and the suicide attempt group (relative to the ideation group). Analysis was conducted in SPSS 22.

Results

Descriptive Statistics and ANOVA

Of the overall sample of 1288 respondents, 583 (45.3%) reported suicidal thoughts but had not acted upon them (ideators), 230 (17.9%) reported suicide attempts (enactors), and 475 (36.9%) reported no history of thoughts or acts (controls). Descriptive statistics, including means (*M*) and standard deviations (*SD*) for all continuous measures are presented in Table 1,

along with the results of ANOVA tests. The ANOVAs indicate that both suicide groups (ideators and enactors) differed significantly from the control group on defeat, entrapment, brooding rumination, goal reengagement, anxiety, depression, perceived burdensomeness, and thwarted belongingness (i.e., the pre-motivational (background variables) and motivational phase variables) in the expected directions (Table 1). In addition, ideators differed significantly from controls on goal disengagement. Enactors also significantly differed from ideators on defeat, entrapment, brooding rumination, goal reengagement, anxiety, depression, perceived burdensomeness, and thwarted belongingness (i.e., the pre-motivational and motivational phase variables), as well as on two of the volitional phase variables: impulsivity and fearlessness about death.

Table 1. *Descriptive statistics and ANOVA results for controls (n = 475), ideators (n = 583), and enactors (n = 230).*

Variable	Control (C)		Attempts (A)				Significant differences (Cohen's <i>d</i>)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Age	24.06	8.25	24.15	8.21	25.10	8.62	
Defeat	28.72	8.69	38.58	11.42	45.45	12.68	C < I (.97); C < A (1.54); I < A (.57)
Entrapment	25.51	10.83	38.17	15.19	47.39	16.75	C < I (.96); C < A (1.55); I < A (.58)
Fearlessness about death	21.19	6.82	20.01	7.12	24.01	7.18	C < A (.40); I < A (.56)
Brooding rumination	10.81	3.22	13.54	3.46	14.87	3.29	C < I (.82); C < A (1.25); I < A (.39)
Goal disengagement	10.36	3.23	11.15	3.50	10.72	3.67	C < I (.23)
Goal reengagement	21.67	4.23	20.30	5.01	19.04	5.76	C > I (.30); C > A (.52); I > A (.23)
Discomfort tolerance	16.70	4.86	16.93	4.48	17.45	4.70	
Impulsivity	4.88	1.65	4.86	1.85	5.31	1.95	C < A (.24); I < A (.24)
Anxiety	14.58	3.86	17.50	4.25	19.23	4.44	C < I (.72); C < A (1.12); I < A (.40)
Depression	10.24	2.82	12.84	3.95	15.01	4.64	C < I (.76); C < A (1.24); I < A (.50)
Burdensomeness	11.51	5.79	18.94	10.04	24.98	11.87	C < I (.91); C < A (1.44); I < A (.55)
Belongingness	27.31	6.31	20.94	7.28	17.83	7.14	C > I (.94); C > A (1.40); I > A (.43)

Note: * $p < .004$ (Bonferroni correction applied).

Hierarchical multinomial logistic regression

The results of the hierarchical multinomial logistic regression analysis are presented in Table 2. In the first step of the analysis, the demographic and mood variables were entered. This model was statistically significant, $\chi^2(14) = 367.97, p < .001$; Cox and Snell = .26; Nagelkerke = .29; McFadden = .14. Results indicate that suicide ideators differed significantly from the control group on three demographic variables (gender, sexual orientation, and ethnicity) and both anxiety and depression, and suicide attempters significantly from the control group in terms of age, sexual orientation, anxiety and depression.

In the second step of the analysis, the motivational phase variables were added to the model which resulted in a substantial Pseudo R² increase ($\chi^2(28) = 481.76, p < .001$; Cox and Snell = .36; Nagelkerke = .41; McFadden = .21). Results indicate that suicide ideators differed significantly from the control group on four of the motivational variables (entrapment, brooding rumination, burdensomeness, and belongingness) while controlling for demographics and mood variables. Suicide attempters differed significantly from the control group on defeat, entrapment, burdensomeness, and belongingness while controlling for demographics and mood variables.

In the final block of the model (step 3), the volitional phase variables were entered, along with anxiety and depression. The model as a whole was statistically significant, $\chi^2(2112) = 2525.41, p < .01$; however, only a small increase in Pseudo R² was noted (Cox and Snell = .41; Nagelkerke = .47; McFadden = .25). The first column in Table 2 has the outcome of 'suicide ideation' compared to 'control' (the reference category). In the final model, results indicate that suicide ideators differed significantly from the control group on five motivational variables (defeat, OR = 1.03; entrapment, OR = 1.02; brooding rumination, OR = 1.09; burdensomeness, OR = 1.04; and belongingness, OR = .95), and two volitional

variables (friend imitation, OR = 1.76; and family imitation, OR = 1.56), and sexual orientation (OR = .47). The second column in Table 2 has the outcome of 'suicide attempts' compared to 'control' (the reference category). Results indicate that suicide attempters differed significantly from the control group on three motivational variables (entrapment, OR = 1.04; burdensomeness, OR = 1.07; and belongingness, OR = .94), and three volitional variables (friend imitation, OR = 4.45; family imitation, OR = 2.44; and fearlessness about death, OR = 1.07), and sexual orientation (OR = .25) and age (OR = 1.04). The final column in Table 2 has the outcome of 'suicide attempts' compared to 'suicide ideation' (the reference category). Results indicate that suicide attempters differed significantly from the ideator group on only volitional variables (impulsivity, OR = 1.15; fearlessness about death, OR = 1.05; friend imitation, OR = 2.54; and family imitation, OR = 1.56), and three demographic variables (sexual orientation, OR = .35, gender, OR = .48, and age, OR = 1.04).

Table 2: Hierarchical Multinomial logistic regression predicting group membership.

Step		Ideation vs. control			Attempts vs. control			Attempts vs. ideation		
		<i>B</i>	<i>SE</i>	OR	<i>B</i>	<i>SE</i>	OR	<i>B</i>	<i>SE</i>	OR
1	Age	.01	.01	1.01 (.98/1.02)	.02	.01	1.02 (1.00/1.04)	.02	.01	1.02 (1.00/1.04)
	Gender	.33	.16	1.40 (1.02/1.92)*	-.31	.23	.74 (.47/1.17)	-.64	.21	.53 (.35/.79)**
	Sex orientation	-1.11	.24	.33 (.21/.53)***	-1.89	.27	.15 (.09/.26)***	-.78	.19	.46 (.32/.67)***
	Relationship	.11	.15	1.11 (.84/1.48)	.17	.20	1.18 (.80/1.74)	.06	.17	1.06 (.76/1.49)
	Ethnicity	.44	.18	1.55 (1.09/2.20)*	.41	.25	1.51 (.92/2.45)	-.03	.23	.97 (.63/1.51)
	Anxiety	.10	.02	1.11 (1.07/1.15)***	.14	.03	1.15 (1.09/1.21)***	.03	.02	1.04 (.99/1.08)
	Depression	.15	.03	1.17 (1.11/1.23)***	.25	.03	1.29 (1.21/1.36)***	.10	.02	1.10 (1.05/1.15)***
2	Age	.01	.01	1.01 (.99/1.03)	.04	.01	1.04 (1.01/1.07)**	.03	.01	1.04 (1.01/1.06)**
	Gender	.31	.19	1.37 (.95/1.98)	-.42	.27	.65 (.39/1.11)	-.74	.23	.48 (.31/.75)
	Sex orientation	-.80	.26	.45 (.27/.75)**	-1.49	.30	.23 (.13/.41)***	-.69	.21	.50 (.33/.76)**
	Relationship	.30	.17	1.35 (.98/1.88)	.37	.23	1.45 (.93/2.25)	.07	.19	1.07 (.74/1.55)
	Ethnicity	.43	.21	1.54 (1.03/2.30)*	.32	.28	1.38 (.79/2.40)	-.11	.25	.90 (.55/1.46)
	Anxiety	.01	.03	1.01 (.96/1.06)	.01	.04	1.00 (.94/1.07)	-.01	.03	.99 (.94/1.05)
	Depression	-.01	.03	1.00 (.93/1.06)	.01	.04	1.01 (.94/1.10)	.02	.03	1.02 (.96/1.08)
	Defeat (M)	.03	.01	1.03 (1.00/1.06)	.04	.02	1.04 (1.00/1.08)*	.01	.02	1.01 (.98/1.04)
	Entrapment (M)	.02	.01	1.02 (1.00/1.04)*	.04	.01	1.04 (1.01/1.07)**	.02	.01	1.02 (1.00/1.04)
	BR (M)	.10	.03	1.09 (1.03/1.16)**	.05	.04	1.05 (.97/1.13)	-.04	.03	.96 (.90/1.02)
	GD (M)	.04	.02	1.04 (.99/1.09)	-.01	.03	.99 (.93/1.06)	-.05	.03	.95 (.91/1.01)
	GR (M)	.01	.02	1.01 (.98/1.05)	-.01	.02	1.00 (.95/1.04)	-.02	.02	.98 (.95/1.02)
	Burdensomeness (M)	.03	.01	1.03 (1.00/1.06)*	.06	.02	1.07 (1.03/1.10)***	.03	.01	1.03 (1.01/1.05)
	Belongingness (M)	-.05	.02	.95 (.93/.98)**	-.05	.02	.95 (.91/.98)**	-.01	.02	.99 (.96/1.03)
3	Age	.01	.01	1.01 (.98/1.03)	.04	.01	1.04 (1.02/1.07)**	.04	.01	1.04 (1.01/1.06)**
	Gender	.29	.20	1.34 (.90/1.98)	-.43	.29	.65 (.37/1.14)	-.73	.24	.48 (.30/.78)**
	Sex orientation	-.76	.27	.47 (.28/.79)**	-1.37	.32	.25 (.14/.47)***	-.61	.22	.55 (.35/.84)**
	Relationship	.25	.17	1.29 (.92/1.80)	.35	.24	1.42 (.89/2.27)	.10	.20	1.11 (.75/1.63)

Ethnicity	.21	.22	1.24 (.80/1.91)	-.10	.31	.90 (.49/1.66)	-.31	.26	.73 (.44/1.22)
Defeat (M)	.03	.02	1.03 (1.00/1.06)*	.04	.02	1.04 (.99/1.08)	.01	.02	1.01 (.98/1.04)
Entrapment (M)	.02	.01	1.02 (1.00/1.05)*	.04	.01	1.04 (1.01/1.07)**	.02	.01	1.02 (.99/1.04)
BR (M)	.09	.03	1.09 (1.03/1.16)**	.06	.04	1.06 (.98/1.15)	-.03	.03	.97 (.91/1.04)
GD (M)	.04	.03	1.04 (.99/1.09)	.01	.03	1.01 (.94/1.08)	-.03	.03	.97 (.92/1.02)
GR (M)	.02	.02	1.02 (.98/1.06)	.01	.03	1.00 (.95/1.05)	-.02	.02	.98 (.95/1.02)
Burdensomeness (M)	.03	.02	1.04 (1.01/1.07)*	.06	.02	1.07 (1.03/1.10)***	.03	.01	1.03 (1.01/1.05)
Belongingness (M)	-.05	.02	.95 (.92/.98)**	-.07	.02	.94 (.90/.98)**	-.01	.02	.99 (.95/1.02)
DISC (V)	-.01	.02	.99 (.96/1.03)	-.02	.03	.98 (.93/1.03)	-.02	.02	.99 (.94/1.03)
FAD (V)	.02	.01	1.02 (.00/1.05)	.07	.02	1.07 (1.03/1.10)***	.04	.01	1.05 (1.02/1.07)***
Impulsivity (V)	-.04	.05	.97 (.88/1.06)	.11	.07	1.11 (.98/1.27)	.14	.05	1.15 (1.04/1.28)**
Exposure (friend) (V)	.56	.17	1.76 (1.26/2.45)***	1.49	.27	4.45 (2.65/7.49)***	.93	.24	2.54 (1.60/4.20)***
Exposure (family) (V)	.45	.18	1.56 (1.10/2.22)**	.89	.24	2.44 (1.52/3.90)***	.45	.20	1.56 (1.06/2.30)*
Anxiety	-.01	.03	.99 (.95/1.05)	-.02	.04	.98 (.91/1.05)	-.02	.03	.98 (.92/1.04)
Depression	-.01	.03	.99 (.93/1.07)	.02	.04	1.02 (.94/1.11)	.03	.03	1.03 (.96/1.10)

Note. *B* = estimate; *OR* = Odds Ratio; *SE* = Standard Error; * $p < .05$; ** $p < .01$, *** $p < .001$. BR= GD=Goal Disengagement, GR=Goal Reengagement, DISC=Discomfort Tolerance, FAD=Fearlessness about death, M=Motivational phase variable, V=Volitional phase variable.

Discussion

The aim of the present study was to extend prior research by testing hypotheses derived from a theoretical model of suicide (the IMV model) about the types of factors that are associated with behavioural enactment of suicide *vs.* ideation. We found evidence in support of our hypotheses. First, both suicide groups (ideators and attempters) differed significantly from controls on four of the motivational phase variables (i.e. defeat, entrapment, burdensomeness, belongingness), and ideators differed significantly from controls on brooding rumination. The ideators and attempters did not differ significantly from each other on any of these measures. Second, volitional phase variables (i.e. self-injury or suicide by a family member, self-injury or suicide by a close friend, impulsivity, and fearlessness about death) distinguished the ideators from the attempters. Compared to ideators, respondents who acted on their thoughts of suicide were significantly more likely to have a family member and/or close friend who had self-injured or attempted suicide, and they were significantly more impulsive and fearless about death. Although the univariate analyses yielded significant differences between ideators *vs.* enactors on defeat and entrapment, this is not inconsistent with the IMV model because neither of these factors emerged in the multivariate analyses. This fits with the IMV model because the latter specifies that it is the volitional phase rather than motivational phase factors which are most important in distinguishing ideation from enactment – and this is what we found in the hierarchical multinomial regression analyses. Not only are these findings consistent with the predictions of the IMV, they also support the interpersonal theory of suicide (Joiner, 2005), which posits that suicide capability is elevated among suicide attempters relative to suicide ideators.

We were also able to replicate the results of prior studies (e.g., Kessler et al., 2009) showing that younger age and minority sexual orientation are significant risk factors for

suicidal behaviour. Interestingly, despite numerous studies documenting a strong association between the presence of mental disorders, particularly depression, and suicidal behaviour, neither anxiety or depression were significantly related to either suicide ideation or attempts in the multinomial logistic regression. One possible explanation for this disparity is that virtually all prior studies have tested bivariate associations between mental disorders and suicidal behaviour (e.g., Kessler, Berglund, & Borges et al., 2005; Nock, Borges, & Bromet et al., 2008); whereas, we carried out both univariate (ANOVAS) and multivariate analyses. This tentatively suggests that anxiety and depression are not specific enough markers to differentiate suicidal respondents from controls when they are included in a model with more proximal markers (e.g., entrapment; O'Connor & Nock, 2014). In line with this suggestion, some previous research has indicated that much of the observed variance between mental disorders and suicide attempts is accounted for by the occurrence of suicide ideation (Kessler et al., 1999; Nock et al., 2008; Nock et al., 2009).

Consistent with Miranda, Scott, Hicks et al. (2008) and O'Connor and colleagues (O'Connor & Noyce, 2008; O'Connor & Williams, 2014), we have generated evidence to further highlight the deleterious effects of brooding rumination, in that higher levels were significantly related to suicide ideation. We also provide further support for research (Orbach, Mikulincer, & King et al., 1997; Smith et al., 2010) indicating that suicide attempters have higher fearlessness about injury and death than do non-suicidal controls, and suicide ideators. Consistent with prior research (e.g., Klonsky & May, 2010), impulsivity was also found to distinguish between ideators and attempters. However, it is important to note that the effect size was small ($OR = 1.15$). This may suggest that when it comes to differentiating attempters from ideators, impulsivity should not be the main focus. Instead, our attention would be better directed at variables such as exposure to self-injurious behaviour in others (friends and/or family members). In addition, it is important to investigate more closely how

impulsivity is operationalized. It would also be useful to determine whether the impulsivity of the act is the same as the impulsivity of an individual. Moreover, it may be that impulsivity only relates to a sub-group of suicide attempters. Contrary to previous findings (e.g., Brezo, Paris, & Vitaro et al, 2006; Klonsky & May, 2010; Liu & Mustanski, 2012; Lynam, Miller, & Miller et al., 2011), however, impulsivity did not distinguish between ideators and controls. This disparity may be due to the different conceptualisations of impulsivity in the literature (Anestis, Soberay, & Gutierrez et al., 2014) or the adoption of only two items to index impulsivity in the present research or because the mean age of our sample is older than many of the previously published studies.

Of the volitional factors – exposure to suicidal behaviour, namely, having a close friend who had self-injured or attempted suicide was statistically the most important, as indicated by the largest odds ratio. This is consistent with similar previous research (O'Connor et al., 2012), and suggests that social relationships, as Durkheim (1951) argued, may not always be protective against suicide, at least not when significant others exhibit self-injurious behaviour. Future research should seek to delineate the mechanism(s) underlying this association, as well as potential moderating variables. Although we suggest here that exposure to suicidal behaviour may increase risk of suicidal behaviour via imitation or social learning, it may also plausibly be the consequence of assortative relating (i.e., homophily), or a dynamic, reciprocal association between selection and socialisation (see Haw, Hawton, Niedzwidz, 2013). Understanding how and when self-injury/suicide exposure becomes salient to an individual's suicidal behaviour would also greatly aid practitioners in their efforts to prevent deaths by suicide.

The findings reported here need to be considered within the context of the limitations of the study. First, the analysis was based on retrospective self-reports, which may contain inaccuracies due to bias or forgetting (Angold, Erkanli, Costello, & Rutter, 1996). There is,

however, some evidence to suggest that past events can be recalled with sufficient accuracy to support their validity (Hardt & Rutter, 2004). Moreover, retrospective data are valuable when prospective data are unavailable (Schlesselman & Schneiderman, 1982), such as in the current study. Second, the motivational and volitional factors included in this research are not exhaustive. Consequently, further research is required to examine the other factors that may govern behavioural enactment. Third, despite the large sample, the majority (over 80%) of those who reported suicide attempts were female thereby precluding reliable group analyses by gender. Fourth, although we found similar rates of suicide ideation and attempts to other studies (Garlow, Rosenberg, & Moore, et al., 2008; Tyssen, Vaglum, Grønvold, & Ekeberg, 2001), there was likely to have been a selection bias favouring individuals with a suicidal history. As a condition of ethical approval, all potential participants were informed about the nature of the study which may have influenced those affected by suicide to participate more. As a consequence we cannot comment on the prevalence of suicidal ideation and behaviour in this study or the relative distribution of the other factors studied herein. Fifth, the fact that participants were students limits the generalizability of the results given that students are not representative of those who die by suicide. Moreover, in light of our recruitment method, we cannot be certain that the sample is generalizable to the entire student population.

Consequently, a key recommendation from the study is the need to test the theory and replicate the findings in other populations. Finally, as the data collected were cross-sectional, we cannot rule out the possibility of reverse causation for some variables. An important next step, therefore, is to test the usefulness of these factors in prospective and longitudinal studies. Such studies would also help to determine the extent to which volitional factors actually predict which individuals with thoughts of suicide go on to attempt suicide.

Despite these limitations, the results contribute considerably to the literature by confirming that the factors that distinguish suicide ideators from controls are not the same as

those that differentiate suicide ideators from suicide attempters. Importantly, the results also reinforce the view that we need to move beyond psychiatric categories if we are to better understand suicidal behaviours (van Heeringen, 2001; Wenzel, Brown, & Beck, 2009; O'Connor & Nock, 2014). The implications for clinical practice and prevention are also considerable. Indeed, the present findings suggest that healthcare professionals should be aware that the factors associated with suicidal ideation can be different from those that govern suicide attempts. They also identify key factors, which could be targeted in treatment. For instance, a cognitive behavioural intervention could help modify some of the underlying processes (e.g., rumination, core beliefs, and cognitive distortions) which contribute to the activation of suicide schema, i.e., the emergence of suicidal ideation (Wenzel et al., 2009). Treating or reducing an individual's level of acquired capability for suicide (i.e., fearlessness about death and pain tolerance) may pose a substantial challenge, as it would likely involve reversing an individual's learned associations about pain, injury, and death. Consequently, interventions that address the effect of exposure to self-injury and/or suicide (i.e., contagion, imitation, and social learning) on behavioural enactment (Abraham & Michie, 2008; Dixie & Johnson, 2010), or reduce the desire for suicide (i.e., cognitive and behavioural strategies designed to decrease thwarted belonging and perceptions of burdensomeness; Joiner, Van Orden, Witte, & Rudd, 2009) despite an increased acquired capability warrant further consideration.

Overall, the results of the present study support the key premise of the IMV model of suicidal behaviour; that the factors and processes underpinning the development of thoughts of suicide (motivational factors) are different from those associated with engaging in suicidal behaviour (volitional factors). In doing so, the results indicate that this model provides a sound theoretical basis for the continued examination of the factors associated with the development of suicidal ideation and the translation of these thoughts into suicidal behaviour,

and highlight the importance of adopting interventions and treatment approaches which differentially address the factors associated with the motivational and the volitional phases of suicide.

References

- Abraham, C., & Michie, S. (2008). A taxonomy of behavior change techniques used in interventions. *Health Psychology, 27*(3), 379-387.
- Ajzen, I. (1991). The theory of planned behaviour, *Organizational Behavior and Human Decision Processes, 50* (2), 179–211.
- Angold, A., Erkanli, A., Costello, E. J., & Rutter, M. (1996). Precision, reliability and accuracy in the dating of symptom onsets in child and adolescent psychopathology. *Journal of Child Psychology and Psychiatry, 37*(6), 657-664.
- Barber, C. W., & Miller, M. J. (2014). Reducing a suicidal person's access to lethal means of suicide: a research agenda. *American Journal of Preventive Medicine, 47*(3), S264-S272.
- Brezo, J., Paris, J., Tremblay, R., Vitaro, F., Zoccolillo, M., Hébert, M., & Turecki, G. (2006). Personality traits as correlates of suicide attempts and suicidal ideation in young adults. *Psychological medicine, 36*(02), 191-202.
- Danielsson, A. K., Wennberg, P., Tengström, A., & Romelsjö, A. (2010). Adolescent alcohol use trajectories: Predictors and subsequent problems. *Addictive Behaviors, 35*(9), 848-852.
- Durkheim, E. (1951). *Suicide: A Study in Sociology*. Glencoe, Ill.: Free Press.
- Dixon, D., & Johnston, M. (2010). Health Behaviour Change Competency Framework: Competences to deliver interventions to change lifestyle behaviours that affect health. *Health Scotland*.
http://www.phorcast.org.uk/document_store/1318587875_wBBR_health_behaviour_change_competency_framework.pdf
- Garlow, S. J., Rosenberg, J., Moore, J. D., Haas, A. P., Koestner, B., Hendin, H., &

- Nemeroff, C. B. (2008). Depression, desperation, and suicidal ideation in college students: results from the American Foundation for Suicide Prevention College Screening Project at Emory University. *Depression and Anxiety, 25*(6), 482-488.
- Gilbert, P., & Allan, S. (1998). The role of defeat and entrapment (arrested flight) in depression: an exploration of an evolutionary view. *Psychological Medicine, 28*(03), 585-598.
- Hardt, J., & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood experiences: review of the evidence. *Journal of Child Psychology and Psychiatry, 45*(2), 260-273.
- Haw, C., Hawton, K., Niedzwiedz, C., & Platt, S. (2013). Suicide clusters: a review of risk factors and mechanisms. *Suicide and life-threatening behavior, 43*(1), 97-108.
- Hawton, K., Van Heeringen, K. (2009). Suicide. *The Lancet, 373*, 1372-1381.
- Joiner Jr, T. E. (2009). *Why people die by suicide*. Harvard University Press, Cambridge MA.
- Joiner Jr, T. E., Van Orden, K. A., Witte, T. K., & Rudd, M. D. (2009). *The interpersonal theory of suicide: Guidance for working with suicidal clients*. Washington, DC, US: American Psychological Association.
- Kessler, R. C., Berglund, P., Borges, G., Nock, M., & Wang, P. S. (2005). Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990-1992 to 2001-2003. *Journal of the American Medical Association, 293*(20), 2487-2495.
- Kessler, R. C., Borges, G., & Walters, E. E. (1999). Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry, 56*(7), 617-626.
- Klonsky, E. D., & May, A. M. (2014). Differentiating suicide attempters from suicide

- ideators: a critical frontier for suicidology research. *Suicide and Life-Threatening Behavior*, 44(1), 1-5.
- Klonsky, E. D., & May, A. (2010). Rethinking impulsivity in suicide. *Suicide and Life-Threatening Behavior*, 40(6), 612-619.
- Liu, R. T., & Mustanski, B. (2012). Suicidal ideation and self-harm in lesbian, gay, bisexual, and transgender youth. *American Journal of Preventive Medicine*, 42(3), 221-228.
- Lynam, D. R., Miller, J. D., Miller, D. J., Bornovalova, M. A., & Lejuez, C. W. (2011). Testing the relations between impulsivity-related traits, suicidality, and nonsuicidal self-injury: A test of the incremental validity of the UPPS model. *Personality Disorders: Theory, Research, and Treatment*, 2(2), 151-160.
- Miranda, R., Scott, M., Hicks, R., Wilcox, H. C., Munfakh, J. L. H., & Shaffer, D. (2008). Suicide attempt characteristics, diagnoses, and future attempts: comparing multiple attempters to single attempters and ideators. *Journal of the American Academy of Child & Adolescent Psychiatry*, 47(1), 32-40.
- Nock, M. K., Hwang, I., Sampson, N., Kessler, R. C., Angermeyer, M., Beautrais, A., ... & Williams, D. R. (2009). Cross-national analysis of the associations among mental disorders and suicidal behavior: findings from the WHO World Mental Health Surveys. *PLoS Medicine*, 6(8), e1000123.
- Nock, M. K., Borges, G., Bromet, E. J., Alonso, J., Angermeyer, M., Beautrais, A., ... & Williams, D. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *The British Journal of Psychiatry*, 192(2), 98-105.
- Nock, M. K., Holmberg, E. B., Photos, V. I., & Michel, B. D. (2007). Self-Injurious Thoughts and Behaviors Interview: Development, reliability, and validity in an adolescent sample. *Psychological Assessment*, 19, 309-317.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of

- depressive episodes. *Journal of Abnormal Psychology*, 100(4), 569-582.
- O'Connor, R.C. (2011). The integrated motivational-volitional model of suicidal behavior. *Crisis*, 32(6), 295-298.
- O'Connor, R. C., Fraser, L., Whyte, M. C., MacHale, S., & Masterton, G. (2009). Self-regulation of unattainable goals in suicide attempters: The relationship between goal disengagement, goal reengagement and suicidal ideation. *Behaviour Research and Therapy*, 47(2), 164-169.
- O'Connor, R.C., Rasmussen, S., and Hawton, K. (2012). Distinguishing adolescents who think about self-harm from those who engage in self-harm. *British Journal of Psychiatry*, 200(4), 330-335.
- O'Connor, R. C., & Noyce, R. (2008). Personality and cognitive processes: Self-criticism and different types of rumination as predictors of suicidal ideation. *Behaviour Research and Therapy*, 46(3), 392-401.
- O'Connor, R. C., O'Carroll, R. E., Ryan, C., & Smyth, R. (2012). Self-regulation of unattainable goals in suicide attempters: A two year prospective study. *Journal of Affective Disorders*, 142(1), 248-255.
- O'Connor, R. C., Smyth, R., Ferguson, E., Ryan, C., & Williams, J. M. G. (2013). Psychological processes and repeat suicidal behavior: A four-year prospective study. *Journal of Consulting and Clinical Psychology*, 81(6), 1137-1143.
- O'Connor, R. C., & Williams, J. M. G. (2014). The relationship between positive future thinking, brooding, defeat and entrapment. *Personality and Individual Differences*, 70, 29-34.
- Orbach, I., Mikulincer, M., King, R., Cohen, D., & Stein, D. (1997). Thresholds and tolerance of physical pain in suicidal and nonsuicidal adolescents. *Journal of Consulting and Clinical psychology*, 65(4), 646-652.

- Plutchik, R., Van Praag, H. M., Conte, H. R., & Picard, S. (1989). Correlates of suicide and violence risk 1: the suicide risk measure. *Comprehensive Psychiatry*, *30*(4), 296-302.
- Power, T. G., Stewart, C. D., Hughes, S. O., & Arbona, C. (2005). Predicting patterns of adolescent alcohol use: a longitudinal study. *Journal of Studies on Alcohol and Drugs*, *66*(1), 74-81.
- Ribeiro, J. D., Witte, T. K., Van Orden, K. A., Selby, E. A., Gordon, K. H., Bender, T. W., & Joiner Jr, T. E. (2014). Fearlessness about death: The psychometric properties and construct validity of the revision to the Acquired Capability for Suicide Scale. *Psychological Assessment*, *26*(1), 115-126.
- Séguin, M., Lynch, J., Labelle, R., & Gagnon, A. (2004). Personal and family risk factors for adolescent suicidal ideation and attempts. *Archives of Suicide Research*, *8*(3), 227-238.
- Schlesselman, J. J., & Schneiderman, M. A. (1982). Case control studies: design, conduct, analysis. *Journal of Occupational and Environmental Medicine*, *24*(11), 879.
- Schotte, D., & Clum, G. (1987). Problem solving skills in suicidal psychiatric patients. *Journal of Consulting and Clinical Psychology*, *55*, 49-54.
- Smith, P. N., Cukrowicz, K. C., Poindexter, E. K., Hobson, V., & Cohen, L. M. (2010). The acquired capability for suicide: A comparison of suicide attempters, suicide ideators, and non-suicidal controls. *Depression and Anxiety*, *27*(9), 871-877.
- Taliaferro, L. A., & Muehlenkamp, J. J. (2014). Risk and protective factors that distinguish adolescents who attempt suicide from those who only consider suicide in the past year. *Suicide and Life-Threatening Behavior*, *44*(1), 6-22.
- Tyssen, R., Vaglum, P., Grønvold, N. T., & Ekeberg, Ø. (2001). Suicidal ideation among

medical students and young physicians: a nationwide and prospective study of prevalence and predictors. *Journal of Affective Disorders*, 64(1), 69-79.

Van Heeringen, C. (2001). The suicidal process and related concepts.

Understanding suicidal

behaviour: the process approach to research and treatment/van Heeringen C.(ed).-

Chichester: John Wiley & Sons, 2001, 1-15.

Van Orden, K. A., Witte, T. K., Gordon, K. H., Bender, T. W., & Joiner Jr, T. E. (2008).

Suicidal desire and the capability for suicide: tests of the interpersonal-psychological

theory of suicidal behavior among adults. *Journal of Consulting and Clinical*

Psychology, 76(1), 72-83.

Wenzel, A., Brown, G. K., & Beck, A. T. (2009). *Cognitive therapy for suicidal patients:*

Scientific and clinical applications. Washington: American Psychological Association.

Williams, J (2001). *The Cry of Pain.* London: Penguin.

World Health Organization. (2014). *Preventing suicide: A global imperative.* World Health

Organization. Geneva, Switzerland: Author.

Wrosch, C., Scheier, M. F., Miller, G. E., Schulz, R., & Carver, C. S. (2003). Adaptive self-

regulation of unattainable goals: Goal disengagement, goal reengagement, and

subjective well-being. *Personality and Social Psychology Bulletin*, 29(12), 1494-

1508.

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta*

Psychiatrica Scandinavica, 67(6), 361-370.

