

The Integrated Motivational-Volitional Model of Suicidal Behavior

An Update

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Introduction

Toward an Integrated Perspective: The Integrated Motivational-Volitional Model of Suicidal Behavior

In the past 30 years, numerous models of suicidal behavior have been put forward that have led to important developments in our understanding of the etiology and course of suicidal behavior (see Table 13.1). As a consequence, there is growing recognition that we need to move beyond the classic psychiatric diagnostic categories if we are to further understand the causes of suicidal behavior (O'Connor & Nock, 2014; van Heeringen, 2001). Some models, such as suicide as escape from self (Baumeister, 1990), have focused on a single driving motivation (i.e., escape); others, for example, the cognitive model of suicidal behavior (Wenzel & Beck, 2008), have attended to a specific domain of risk (e.g., cognition). Others still, including Schotte and Clum's (1987) diathesis-stress model, have highlighted cognitive vulnerabilities that become pernicious when activated by stress. As a result of the emergence of these theoretical models, a plethora of personality factors (e.g., impulsivity) and cognitive factors (e.g., social problem solving) have been identified and shown to increase risk of repeat self-harm and suicide (e.g., Brezo, Paris, & Turecki, 2006; Ellis & Rutherford, 2008; O'Connor, 2010; O'Connor & Nock, 2014). Despite these developments, many of the predictive models have adopted a narrow focus or have failed to build on the growing empirical evidence base. Therefore, O'Connor's (2011a) central aim of developing a new integrated model was to synthesize the evidence that had already been garnered from the predominant models. Moreover, with only a few exceptions, previous models have not been particularly successful in differentiating between those who think about suicide, but do not attempt suicide (suicide ideators), and those who go on to engage in suicidal behavior (suicide attempters; Hagan,

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Table 13.1 Selected Predominant Models of Suicidal Behavior from the Past 30 Years

Author	Model	Basic premise
Shneidman (1985)	Cubic model of suicide	Press (stress) + pain (psychache) + perturbation = suicide risk.
Schotte and Clum (1987)	Diathesis–stress–hopelessness model of suicidal behavior	Cognitive vulnerability (e.g., social problem solving) accounts for the relationship between stress and suicide risk.
Baumeister (1990)	Suicide as escape from self	Primary motivation of suicide is to escape from painful self-awareness.
Mann, Waternaux, Haas, and Malone (1999)	Clinical model of suicidal behavior	Stress–diathesis model wherein suicide risk is determined not only by psychiatric disorder (stressor) but by a diathesis (including tendency to experience more suicidal ideation, impulsivity).
Rudd, Joiner, and Rajab (2001)	Suicidal Mode as cognitive behavioral model of suicidality	Based on 10 CBT requirements and has four system characteristics of the suicidal mode (cognitive, affective, behavioral, physiological).
Williams (2001)	Arrested flight model	Suicide risk is elevated when defeat and entrapment are high and the potential for rescue (e.g., social support) is low.
Joiner (2005)	Interpersonal-psychological model	Suicidal desire is determined by high levels of burdensomeness, and thwarted belongingness. Desire is likely translated into suicidal behavior when capability is high.
Johnson, Gooding, and Tarrier (2008)	Schematic Appraisal Model of Suicide	An appraisal model that proposes risk is determined by the interplay between information processing biases, schema, and appraisal systems.
Wenzel & Beck (2008)	A cognitive model of suicidal behavior	Diathesis–stress model with three main constructs: dispositional vulnerability factors, cognitive processes associated with psychiatric disturbance, and cognitive processes associated with suicidal acts.
Williams et al. (2008)	Differential activation theory of suicidality	Associative network model. The experience of suicidal ideation/behavior during a depressive episode increases the likelihood that it will re-emerge during subsequent episodes.
O'Connor (2011)	Integrated Motivational-Volitional Model (IMV) of suicidal behavior	The IMV model is a diathesis–stress model that specifies the components of the premotivational, motivational (ideation/intent formation), and volitional (behavioral enactment) phases of suicidality.
Klonsky and May (2015)	The Three Step Theory (3ST) of suicide	“Ideation to action” framework. Transition from suicidal ideation to behavior occurs in the presence of pain (physical, emotional or social), hopelessness, and disconnectedness (lack of connection to others, to a role, or job etc).

Ribeiro, & Joiner, Chapter 12 this volume). Indeed, as the majority of suicide ideators do not go on to attempt suicide (Kessler, Borges, & Walters, 1999), any model has to be both specific and sensitive, to be useful. As suicide attempt and self-harm are often used interchangeably, for the present purposes where we use the terms *suicide attempt* or *suicidal behavior*, we are referring to self-injurious behavior with evidence of suicidal intent. Consistent with the National Institute of Health and Care Excellence guidelines (NICE, 2011), *self-harm* is used as an overarching term to describe all self-harming behaviors irrespective of whether suicidal intent has been explicitly ascertained or not.

Brief Overview of Integrated Motivational-Volitional Model of Suicidal Behavior

O'Connor (2011a; see also 2011b) incorporated the major components from the predominant models of suicidal behavior (outlined in Table 13.1) into an integrated three-phase model of suicidal behavior, the Integrated Motivational-Volitional (IMV) model of suicidal behavior, which discriminates between suicide ideators and suicide attempters. In brief, the IMV model proposes that suicidal behavior results from a complex interplay of factors, the proximal predictor of which is one's *intention* to engage in suicidal behavior (behavioral intention). Behavioral intention, in turn, is determined by feelings of entrapment where suicidality is seen as the salient solution to life circumstances and entrapment is triggered by defeat/humiliation appraisals (see Figure 13.1). Crucially, the transitions from defeat/humiliation to entrapment, from entrapment to suicidal ideation/intent, and from ideation/intent to suicidal behavior are determined by state-specific moderators (i.e., factors that facilitate/obstruct movement between states), entitled threat to self, motivational and volitional

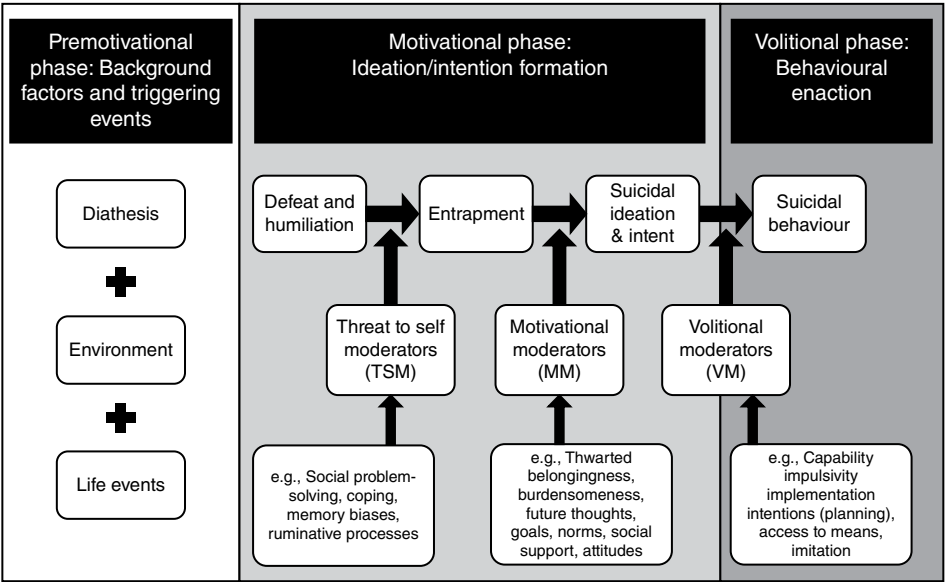


Figure 13.1 Integrated motivational-volitional (IMV) model of suicidal behavior.

moderators, respectively. In addition, background factors (e.g., deprivation, vulnerabilities) and life events (e.g., relationship crisis), which collectively comprise the premotivational phase (i.e., before the commencement of ideation formation), provide the broader biosocial context for suicide. In brief, therefore, the premotivational phase outlines the broader context in which suicidal thinking or behavior may occur, the motivational phase describes the development of suicidal thoughts, and the volitional phase describes when suicide attempts are more likely to happen.

Conceptual and Empirical Rationale for IMV Model

Although the development of the IMV model was influenced by a number of different models, the main drivers were the Theory of Planned Behavior (TPB; Ajzen, 1991), the diathesis–stress hypothesis (Schotte & Clum, 1987), and the arrested flight model of suicidal behavior (Williams, 2001). We address each of these influences in turn, including exemplars, where appropriate, from studies with direct or indirect support for the IMV model. To this end, we have drawn, in large part, from the work conducted within our group, the Suicidal Behaviour Research Laboratory (www.suicideresearch.info) at the University of Glasgow. The TPB (Ajzen, 1991), a social cognitive model of behavior, provided a unifying theoretical framework for the IMV model. The TPB posits that the proximal predictor of any behavior is one's behavioral intention (i.e., one's motivation to engage in the behavior). In turn, attitudes, subjective norms, and perceived behavioral control are thought to determine intention. As an overarching framework, the TPB was a likely candidate to describe suicidal behavior as it makes the distinction between the formation of behavioral intention (i.e., development of suicidal ideation and intent), on the one hand, and acting on that intention (i.e., making a suicide attempt), on the other. Not only is the TPB conceptually useful but there was empirical evidence in support of its utility in the context of hospital-treated self-harm (O'Connor, Armitage, & Gray, 2006).

In contrast to the traditional view of suicidal behavior as a symptom associated with a mental disorder, with the health professional's task being the treatment of the patient's underlying pathology (Michel & Valach, 2001), O'Connor (2011a) posited that a focus on the behavior itself, rather than merely seeing it as an epiphenomenon of mental disorder, opens up a number of theoretical and prevention possibilities that may yield considerable fruit.

Although most people who experience suicidal ideation and intent do not engage in (enact) suicidal behavior, our ability to predict which of those who think about suicide will go on to engage in the behavior is limited. Indeed, understanding this distinction has been recently re-emphasized as a critical target for future research (Klonsky & May, 2014; O'Connor & Nock, 2014). The important point here is that the factors associated with ideation formation are distinct from those factors concerned with behavioral enactment. This has been highlighted by several studies including recent research in adults and adolescents that demonstrates, for example, that impulsivity distinguishes between those who think about self-harm/suicide and those who engage in self-harm/suicidal behavior (Dhingra, Boduszek, & O'Connor, 2015; O'Connor, O'Carroll, Ryan, & Smyth, 2012). The underlying rationale and theoretical background for the development of the IMV model is discussed extensively elsewhere (O'Connor, 2011a, 2011b). There is also empirical evidence to support the overarching structure of the IMV model (Dhingra, Boduszek, & O'Connor, 2016).

A Biopsychosocial Perspective and the Premotivational Phase

The proposed motivational and volitional phases of the model do not operate in a biosocial vacuum. Rather, they are influenced by the interactive diathesis–environment–life events triad that comprises the premotivational phase of the model (i.e., background factors and triggering events). In essence, the diathesis–stress model posits that suicidal behavior occurs as a result of the interaction between nature and nurture. Specifically, the diathesis, which may be biological or genetic, confers vulnerability, and it is this vulnerability that becomes activated or exacerbated in the presence of stress. Stress may take the form of environmental factors (e.g., deprivation) or negative life events (e.g., relationship breakup), and the diathesis–stress hypothesis posits that the impact of environment and events is more marked among those who are, by definition, vulnerable. The experience of psychiatric illness is characterized as a stressor in Mann's clinical model of suicidal behavior (Mann *et al.*, 1999, 2005). Vulnerability may also develop in the context of adverse environmental circumstances. For example, the development of perfectionism may be associated with inconsistent, absent, or conditional parental approval (Barrow & Moore, 1983). Adversity experienced early in life is also important in this regard (O'Connor & Nock, 2014).

In addition, social position, rather than simply a lack of material resources, may contribute to environmental or socioeconomic vulnerability. For example, in a recent study from our group, how an individual's income ranks with others of a similar background (rather than their absolute income) helps account for the association between low income and suicidal thoughts/behaviors (Wetherall, Daly, Robb, Wood, & O'Connor, 2015).

Personality and individual differences variables that confer personal vulnerability (e.g., perfectionism) are included in the premotivational phase but may also impact risk during the motivational phase when triggered by defeat and humiliation. This apparent double counting acknowledges the fact that many of the individual differences variables implicated in suicidality are state-like as well as being trait-like (Williams, Crane, Barnhofer, & Duggan, 2005). Further to this, in a recent study using a clinical sample of depressed adolescents, trait social perfectionism interacted with daily hassles to predict concurrent suicide potential; therefore, providing further support for perfectionism as a vulnerability factor within the premotivational diathesis–stress phase of the IMV model (Hewitt, Caelian, Chen, & Flett, 2014).

The differential activation model of suicidal behavior (Williams, Barnhofer, Crane, & Beck, 2005; Williams, Crane, *et al.*, 2005) accounts for these trait-and-state components. This latter model posits that associations made when an individual is in a low mood are reactivated when the same mood is encountered again. Within the context of suicidal risk, there is an important consequence of such network associations: if suicidal ideation or behavior is experienced in one depressive episode, they are more likely to be triggered and experienced in subsequent episodes. Although mood may return to normal, the associations remain but they are latent, becoming more and more easily activated following each episode of low mood. Consequently, it is this differential activation that accounts, in part, for the increased repetition of suicidal ideation/behavior once initially experienced. The extent to which differential activation acts as a motivational and/or volitional moderator varies as a function of whether suicidal ideation and/or behavior are experienced during a depressive mood or triggered by defeat or entrapment.

Recent research has explored sensitivity to emotional pain as another potential factor within the premotivational phase of the IMV. Investigating this in an adult community sample, emotional pain sensitivity was found to be highest in those who had enacted self-harm, followed by those reporting self-harm ideation, and lowest in controls with no history of self-harm thoughts or behaviors (Kirtley, O'Carroll, & O'Connor, 2015a). Furthermore, within the enactment group, higher sensitivity to emotional pain was positively correlated with higher levels of perfectionism. The degree to which an individual is sensitive or reactive to emotional pain may, therefore, confer increased vulnerability for the development of both self-harm ideation and enactment. See also Kirtley, O'Carroll and O'Connor (2015b) for a discussion of methodological issues in such studies.

Motivational and Volitional Phases

As noted earlier, the arrested flight model of suicidal behavior (Williams, 2001) was a key driver for the IMV model. Consequently, the core pathway to suicidal behavior that traverses both the motivational and volitional phases was adapted from Williams and colleagues' model (Williams, 2001; Williams, Barnhofer, et al., 2005; Williams, Crane, et al., 2005). Taking the motivational phase first, Williams posits in his model that the development of suicidal ideation is predicated on feelings of entrapment that have been triggered by the experience of defeat and/or humiliation. The central roles of defeat and entrapment in the etiology and course of psychological health arose out of the work by Gilbert and colleagues on the origins of depression (e.g., Gilbert & Allan, 1998). Williams extended their work to encompass suicidal behavior by arguing that, when the desire to escape from a defeating and/or humiliating situation is thwarted, feelings of entrapment ensue, and the likelihood of suicidal ideation is increased if there is little hope of rescue, for example, when positive future thinking is absent (Williams, Crane, et al., 2005).

There is growing empirical evidence for the importance of defeat and entrapment in the etiology of suicidal behavior (O'Connor, 2003; O'Connor, Smyth, Ferguson, Ryan, & Williams, 2013; Rasmussen et al., 2010; Williams, Barnhofer, et al., 2005; Williams, Crane, et al., 2006). In an earlier case-control study, O'Connor (2003) found that the arrested flight variables (high inescapability, high defeat, and low social support) significantly discriminated between self-harm patients and controls. Moreover, in the multivariate analyses, none of the clinical variables (anxiety, depression, hopelessness) was a statistically significant predictor when considered alongside the arrested flight variables. More recently, Rasmussen et al. (2010) compared three groups of patients (first-time self-harm patients, repeat self-harm patients, and hospital controls) on the arrested flight variables and found that the three groups differed along each of these constructs in the predicted directions. Thus, repeat self-harm patients reported significantly higher levels of entrapment than first-time self-harm patients and hospital controls. Similar outcomes have been found in prospective studies. For example, in one study of individuals who had previously attempted suicide, defeat and entrapment were univariate predictors of a subsequent suicide attempt, 4 years after the index attempt. In multivariate analysis, even after controlling for depression, hopelessness and number of previous suicide attempts, entrapment and frequency of past suicide attempts remained significant predictors of a repeat attempt (see Figure 13.2; O'Connor, Smyth, Ferguson, Ryan, & Williams, 2013).

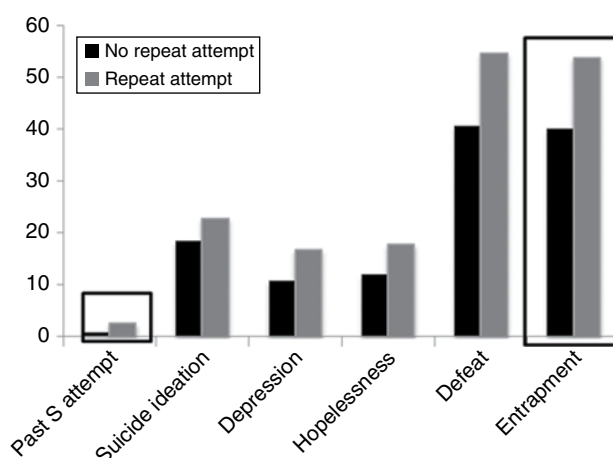


Figure 13.2 Predictors of repeat suicidal behavior (from “Psychological processes and repeat suicidal behaviour: A four-year prospective study,” by O’Connor, R. C. et al., 2013. *Journal of Consulting and Clinical Psychology*, 81, 1137–1143. Reproduced with permission of APA). *Note.* The boxes surrounding past suicide attempt and entrapment indicate that these are significant predictors in the multivariate analyses.

Defeat and Humiliation Within the IMV model, it is hypothesized that sensitivity to signals of defeat and humiliation are determined by background factors (drawn from the premotivational phase). As an example, this sensitivity to signals of defeat may be increased by what we believe others expect of us. In suicidal individuals, such expectations are often excessive and unrealistic, with the suicidal individual believing that they will be considered a failure if they do not achieve certain standards (Hewitt, Flett, Sherry, & Caelian, 2006; O’Connor et al., 2007). Individuals with such beliefs are thought to score highly on the personality dimension called socially prescribed perfectionism (Hewitt & Flett, 1991; Hewitt et al., 2006; O’Connor, 2007; O’Connor et al., 2007; O’Connor & O’Connor, 2003). Socially prescribed perfectionism assesses the degree of personal belief that others hold unrealistically high expectations of one’s behavior and that they would only be satisfied with these standards (Hewitt & Flett, 1991).

In an adolescent study (O’Connor, Rasmussen, & Hawton, 2010), we obtained evidence that points to one mechanism through which socially prescribed perfectionism may increase the risk of self-harm. We tracked 500 adolescents over a period of 6 months and recorded the number of acute life stressors that they had experienced over this period as well as recording their socially prescribed perfectionism levels when they entered the study (using the Child and Adolescent Perfectionism Scale; CAPS-14; O’Connor, Dixon, & Rasmussen, 2009). Therefore, we were able to determine the extent to which the personal experience of acute life stress and socially prescribed perfectionism predicted self-harm.

As expected, those adolescents who had encountered high levels of acute life stress (including bullying, sexual abuse, concerns about sexual orientation) were more likely to report self-harm than those who reported low levels of stress (31 out of the 500 adolescents reported self-harm during the six months of the study). In addition, however, we found evidence of a perfectionism–stress interaction, although the

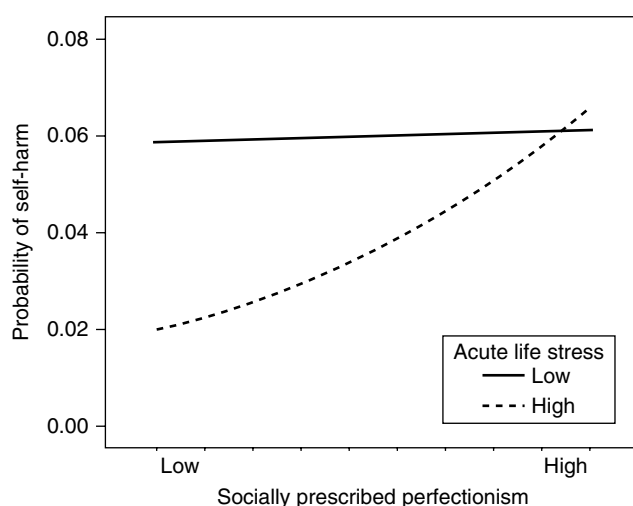


Figure 13.3 The probability of self-harm between Time 1 and Time 2 as a function of acute life stress and socially prescribed perfectionism (from “Predicting depression, anxiety and self-harm in adolescents: The role of perfectionism and acute life stress,” by O’Connor, R. C. et al., 2010, *Behaviour research and therapy*, 48, 52–59. Reproduced with permission of Elsevier).

moderating effect was not quite as we had anticipated. Our data suggested that socially prescribed perfectionism lowers stress tolerance (the level above which stress becomes distressing). In other words, it seems to have a “stress-threshold lowering effect” (O’Connor et al., 2010): among those high on social perfectionism, relatively low levels of acute stress were associated with a self-harm episode (see Figure 13.3). This latter finding is consistent with the differential activation theory of suicidal behavior (Williams, Crane, et al., 2005) but needs to be investigated in more detail within an experimental paradigm, to determine whether the relationship is causal.

From Defeat and Humiliation to Entrapment: Threat to Self-Moderators

Although entrapment can be triggered by defeat/humiliation, it is not inevitable that the experience of defeat/humiliation will lead to entrapment: *threat to self-moderators* (TSMs) have the potential to increase the likelihood that the former leads to feelings of entrapment. TSMs are defined as any variable that attenuates or strengthens the relationship between threat to self-appraisals (i.e., defeat/humiliation, and entrapment). Components within the TSM are activated in response to a defeating or humiliating appraisal (usually following the experience of negative life stress or a change in severity of existing chronic stress). Social problem solving is a likely candidate as a moderator of the defeat–entrapment relationship because it is activated in an attempt to resolve the defeating/humiliating situation. Over-general autobiographical memory biases are also included here as they are known to be associated with impaired social problem solving (e.g., Evans, Williams, O’Loughlin, & Howells, 1992; Pollock & Williams, 2001). The evidence implicating social problem solving and autobiographical memory in the suicidal process is well established (Speckens & Hawton, 2005; Williams et al., 2007). Over-general memories are incomplete, lacking in specific detail, and often referring to activities/objects without specifying a time period or

covering a time period that is greater than a day (Evans et al., 1992). Given that we rely heavily on memories to solve interpersonal problems, it is easy to see how this over-general memory bias impairs problem solving and is implicated in emotional distress more generally (Pollock & Williams, 2001; Williams et al., 2007).

Rumination, defined as enduring and repetitive, self-focused thinking in response to depressed mood (Rippere, 1977), is another TSM. Despite its well-established and persistent relationship with depression, its relationship with suicidality has only recently been established (Morrison & O'Connor, 2008). For example, Smith, Alloy, and Abramson (2006) found that rumination predicted the presence and duration of suicidal ideation over 2.5 years. Recent research also suggests that a particular type of rumination, known as brooding rumination, is especially deleterious in the suicidal process. According to Treynor, Gonzalez, and Nolen-Hoeksema (2003), brooding is the "passive comparison of one's current situation with some unachieved standard" (p. 256). Further support comes from a recent study examining the effect of brooding rumination and reflection on the defeat–entrapment relationship. Tucker, O'Connor, and Wingate (in press) found that brooding rumination moderated the defeat–entrapment relationship at all levels (low, moderate, high), whereas reflection had no moderating effect on the relationship. It is easy to see how this type of thinking could be problematic: although the individual is thinking about the cause(s) of their distress, they are not actively seeking to solve the problem; rather, they are dwelling on their distress, comparing their situation unfavorably to the outcome that they desire, but they are not actively pursuing the desired outcome. This type of thinking can escalate and explains, in part, the sometimes apparent time lag between the experience of defeat and entrapment and subsequent suicidality (Williams, Crane, et al., 2005). Rumination is also known to interfere with autobiographical memory and social problem solving (Watkins & Baracaia, 2002; Watkins, Teasdale, & Williams, 2000), thereby highlighting further mechanisms that account for the former's relationship with suicidality. There is also some observational evidence that rumination is elevated among individuals who score highly on measures of self-criticism (O'Connor & Noyce, 2008).

From Entrapment to Suicidal Ideation/Intent: Motivational Moderators

The IMV model suggests that the presence/absence of *motivational moderators* (MMs) increases/decreases the likelihood that entrapment is translated into suicidal ideation and intent. A motivational moderator is broadly defined as any factor (moderator) that changes the likelihood that entrapment will lead to suicidal ideation and intent. Absence of positive future thinking, lack of goal re-engagement, and low levels of social support would be typical of MMs, as they increase the likelihood that suicidal ideation will develop following entrapment. Recent research looking at factors affecting this relationship also highlighted hope as a potential moderator (Tucker et al., in press). The authors found that in the presence of higher levels of hope, entrapment, and suicidal ideation were no longer related. In the following paragraphs, we consider some of the evidence for positive future thinking and goal re-engagement.

There is now a robust body of evidence confirming that a pattern of future thinking characterized by a dearth of positive thinking is particularly implicated in the etiology of suicide risk independent of depression (Hunter & O'Connor, 2003; MacLeod, Pankhania, Lee, & Mitchell, 1997; MacLeod et al., 1998). Conversely, suicidal

individuals are not preoccupied by impending doom or overwhelmed by negative future expectations (MacLeod et al., 1997, 1998; O'Connor et al., 2007). In clinical studies, positive future thinking is usually assessed with the Future Thinking Task (FTT; MacLeod et al., 1997). The FTT asks respondents to think of as many things as possible that they are looking forward to (positive future thinking) or worried about (negative future thinking) across different future time frames (e.g., the next week, the next year, the next 5–10 years). These things, events, or future experiences can be anything (e.g., playing in the park with my son); the only constraint is that there must be a realistic possibility of their occurrence. In terms of the IMV model and the motivational moderator construct, following defeat/humiliation and entrapment, the development of suicide ideation/intent should be significantly more likely when there is a concomitant paucity in positive future thinking. We have found that this is, indeed, the case. In a clinical study (largely consisting of patients admitted to hospital following an overdose), impaired positive future thinking moderated the relationship between entrapment and suicidal ideation (Rasmussen et al., 2010). In other words, patients who felt trapped (i.e., high entrapment) were significantly more suicidal if they also had impaired positive future thinking, compared to those with high levels of positive future thinking.

Nor does positive future thinking appear to be an artifact of mood, as the impairment in positive future thinking is not accounted for by severity of depressive symptoms (MacLeod et al., 1997; Hunter & O'Connor, 2003; O'Connor, Connery, & Cheyne, 2000). Moreover, these expectancies are powerful predictors of suicidal ideation, in the short term, at least. For example, the relative strength of the widely used Beck Hopelessness Scale (BHS; Beck, Schuyler, & Herman, 1974), an established index of generalized hopelessness for the future, was compared with positive future thinking, as assessed via the FTT (O'Connor, Fraser, Whyte, MacHale, & Masterton, 2008). After controlling for baseline depression, anxiety, and suicidal ideation in a sample of repeat self-harm patients, impaired positive future thinking but not generalized hopelessness predicted residual suicidal ideation 2.5 months after admission to hospital. In short, there is reasonable evidence that positive future thinking is a motivational moderator of the entrapment–suicidal ideation relationship. However, a recent prospective study of ours suggests that the relationship between positive future thinking and suicide risk may be more complicated than originally thought (O'Connor, Smyth, & Williams, 2015). In the first study of its kind, O'Connor and colleagues investigated the relationship between the content of positive future thoughts and suicide risk. We aimed to determine whether positive future thoughts are always protective, hypothesizing that specific types of positive thoughts that are not achievable may become deleterious over time. To investigate this, they tracked patients following a suicide attempt over 15 months, and found that those who reported relatively high numbers of a specific type of positive future thinking—*intrapersonal* positive future thoughts (i.e., positive thoughts about one-self, including thoughts about being healthier, less depressed, or more confident) at baseline were significantly more likely to have attempted suicide at follow-up. This finding may suggest that patients with higher levels of intrapersonal positive future thinking, over time believe that they have not achieved what they expected to, and this realization may be associated with more intense suicidal ideation and suicidal behavior. Further research is warranted to investigate whether intrapersonal positive future thinking is also predictive of death by suicide.

Psychological science studies focusing on self-regulation have grown markedly in recent years (e.g., Baumeister & Vohs, 2004; Carver & Scheier, 1998). Self-regulation is defined as “the many processes by which the psyche exercises control over its functions, states and inner processes” (Vohs & Baumeister, 2004, p. 1). Indeed, one of the processes implicit in adaptive self-regulation is the successful identification, pursuit, and attainment of goals. Moreover, the self-regulation literature has recently been extended to include dysfunctional regulation, characterized by a failure to relinquish a goal that is not attainable and the subsequent re-engagement in new goals when existing goal pursuit is thwarted (Wrosch, Scheier, Carver, & Schulz, 2003; Wrosch, Scheier, Miller, Schulz, & Carver, 2003). To investigate these dual processes, Wrosch and colleagues developed a new psychological measure (Wrosch, Scheier, Miller *et al.*, 2003), the Goal Adjustment Scale, to assess goal disengagement (i.e., disengaging from an unattainable goal) and goal re-engagement (i.e., redirecting attention to a new attainable goal).

For the present purposes, goals were thought to be akin to positive future thoughts. Therefore, in a study of suicide attempters (O'Connor, Fraser, Whyte, MacHale, & Masterton, 2009), suicidality was hypothesized to be associated with low levels of goal re-engagement. In addition, the absence of goal re-engagement was thought to be exacerbated if an individual had also disengaged from existing goals. We also wondered what would motivate an individual to continue living if they are not engaged in goal pursuit, especially if one considers that goals give meaning to people's lives (Carver, 2004). Consistent with this view, Carver and Scheier (1998) suggested that the concept of complete disengagement (i.e., high goal disengagement and low goal re-engagement) may be central to the suicidal impulse. This self-regulatory approach has merit, as we have previously found levels of suicidal ideation a few months following a suicide attempt to be significantly higher among those who had reported high levels of disengagement and low levels of goal re-engagement in the 24 hours following their suicide attempt (O'Connor *et al.*, 2009). However, in a more recent study, we found that the relationship between goal regulation and self-harm is affected by age (O'Connor *et al.*, 2012). Specifically, whereas the absence of goal re-engagement was consistently associated with self-harm, there was evidence that among older adults their risk of repeat self-harm (following an index suicide attempt) was elevated if they also reported high levels of disengagement. Conversely, young people who were engaged in painful goal engagement, defined as those who reported low levels of goal disengagement and low levels of goal re-engagement, were also at increased risk of self-harm. In sum, these findings suggest that goal adjustment is another potential motivational moderator that could be targeted therapeutically to reduce the likelihood that entrapment triggers suicidal ideation/intent. It would also be useful to improve understanding as to how and why disengagement happens and what prevents goal re-engagement. For example, to what extent are trait personality factors, such as perfectionism and pessimism, implicated and in what circumstances do environmental constraints play a role?

From Suicidal Ideation/Intent to Suicidal Behavior: Volitional Moderators

This section addresses the transition of suicidal ideation/intent to suicidal behavior. As noted earlier, the majority of models of suicide risk fail to make predictions about those factors that are specifically associated with ideation/intention versus those that

are associated with translating ideation/intention into action. The IMV model is explicit in this regard as it proposes that a group of factors, the *volitional moderators* (VMs), determine the conditions and situations in which an individual is at increased risk of suicidal behavior. A volitional moderator is defined as any factor that bridges the suicidal intention–behavior gap (i.e., any factor that renders it more or less likely that an individual will act on their suicidal intent). This behavioral enaction phase is derived from the TPB, and is consistent with Williams’ arrested flight model and Joiner’s Interpersonal-Psychological model of suicidal behavior (Joiner, 2005). Full details of the interpersonal-psychological model are described by Hagan, Ribeiro, and Joiner in Chapter 12. The IMV model provides more details about the factors that govern the transition from suicidal thoughts to suicide attempts than any of the previous models. Since the publication of the IMV model (O’Connor, 2011a), Klonsky and May (2015) have proposed the Three Step Theory (3ST) of suicide, which also highlights the suicidal ideation to attempts transition. Having access to the means of suicide, having the capability to attempt suicide, knowing others who have engaged in suicidal behavior (i.e., exposure to suicide), and impulsivity are examples of VMs. The latter two VMs have been shown to distinguish between adolescents who have thought about self-harm and those who have engaged in self-harm. In an international survey of over 30,000 adolescents (mainly 15–16 year olds), impulsivity distinguished between self-harm ideators and enactors, as did knowing others who had engaged in self-harm (Madge et al., 2011). We reported similar outcomes in a large-scale survey of 5,604 adolescents (O’Connor, Rasmussen, & Hawton, 2012). We assessed variables from all three phases of the IMV and, as predicted by the model, none of the variables from the premotivational (trait) and motivational phases (perfectionism, self-esteem, optimism, and brooding rumination) were able to differentiate ideators from enactors. The volitional phase variables (impulsivity, awareness of self-harm by friends or family, and descriptive norms) were the only ones to distinguish between ideators and enactors, even after depression and anxiety were controlled for. Dhingra et al. (2015) extended this work by testing the IMV model in a large adult community sample. Their results were in keeping with the predictions made by the IMV model; when all of the factors were considered together (in a multivariate model), the motivational phase variables (brooding rumination, socially prescribed perfectionism) differentiated controls from suicide ideators and suicide enactors (attempters), but they did not differ significantly *between* ideators and enactors. VMs, particularly impulsivity, exposure to self-harm by friends or family, and fearlessness about death, again differentiated those who seriously thought about suicide from those who attempted suicide.

The concepts of behavioral enaction and bridging the intention–behavior gap are well established within health psychology. Whereas behavioral scientists are often keen to identify the barriers to behavioral enaction (i.e., why is there a gap between intention and behavior), suicidologists wish to obviate the bridging of the intention–behavior gap. A better understanding of those factors that bridge the intention–behavior gap will inform the development of interventions to reduce the likelihood of behavioral enaction. To this end, a key development within the intention–behavior gap field was proffered by Gollwitzer (1999), who described implementation intentions, which are defined as plans that link critical situations to goal-directed responses. In short, these are plans that include thinking about the when, the where, and the how of behavioral enaction (i.e., action and coping planning).

In the traditional health behavior context, it is thought that the mere formation of these simple plans passes control of the goal-directed behavior over to the environment, such that when the environmental cues are subsequently encountered, the target behavior is elicited (and perhaps automatically; Gollwitzer, 1999). For the present purposes, the *when*, the *where*, and the *how* relate to planning when an individual will attempt suicide, where will that be, and what method they will choose. The attraction of implementation intentions in understanding suicide risk is three-fold: first, they are akin to developing a suicidal plan, which is a well-established indicator of elevated risk of completed suicide (Jobes, 2006); second, they had a medium–large effect on behavioral enactment/goal attainment (Gollwitzer & Sheeran, 2006); and, third, they provide pragmatic opportunities for intervention. Indeed, a brief psychosocial intervention has been developed by Armitage and colleagues on the basis of the implementation intentions literature (Armitage, Abdul Rahim, Rowe, & O'Connor, 2016).

Armitage *et al.* (2016) investigated the use of a volitional help sheet (VHS, which encourages respondents to link critical situations when they are tempted to self-harm to solutions other than self-harm) and self-generated implementation intentions in a Malaysian hospital population, following an act of self-harm, to reduce future suicidal ideation and behavior. In this exploratory study, implementation intention formation was associated with lower levels of suicidal ideation and behavior, fewer threats to attempt suicide in the future, and a lower reported likelihood of future suicide attempts, at 3-month follow-up, compared to controls. Specifically, the largest decreases in suicidal ideation, behaviors, threats to attempt suicide, and reported likelihood of future suicide attempts were observed in the VHS condition, suggesting that the structured support of the VHS may enhance the benefits of, and aid patients in, implementation intention formation (although replication is urged as there was substantial attrition in the study). Research is under way within the Suicidal Behaviour Research Laboratory to further investigate the use of the VHS within a UK population of patients who have attempted suicide. Specifically, O'Connor, Ferguson, Smyth, Beautrais, and Armitage (in preparation) have conducted a large-scale randomized controlled trial of the VHS in a UK sample and are in the process of writing these findings up for publication (see www.suicideresearch.info).

Suicide-related imagery may also play a role bridging the suicidal intention–behavior gap. Indeed, the act of imagining attempting suicide has been shown to be associated with worst-ever suicidal ideation in a clinical sample of depressed individuals (Holmes, Crane, Fennell, & Williams, 2007). Furthermore, those who report being less distressed by such images and deriving comfort from them are more severely suicidal than those who find imagining suicide to be distressing (Crane, Shah, Barnhofer, & Holmes, 2012). Imagery may increase individuals' acquired capability for suicide, acting almost as a rehearsal for actual suicidal behavior.

Joiner's acquired capability concept is also a volitional moderator (see Chapter 12). Acquired capability describes one's ability to act upon suicidal desires, to enact lethal self-injury, and is thought to increase via exposure and habituation to self-injury (Joiner, 2005; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). In short, higher levels of capability increase the likelihood that suicidal intent is translated into behavior. Acquired capability is a multifaceted construct, of which two components, fearlessness about death and physical pain tolerance, have received increasing attention. Fearlessness about death arises from repeated exposure to painful or traumatic stimuli,

such as self-injury or military combat, and allows individuals to overcome the natural instinct for self-preservation and engage in lethal self-injury (Ribeiro, Witte et al., 2014). Further research has demonstrated an interaction between overarousal and fearlessness about death, in the relationship with suicidal ideation, such that ideation was elevated in those experiencing overarousal and high levels of fearlessness about death (Ribeiro, Silva, & Joiner, 2014). A number of studies have investigated pain tolerance in both nonsuicidal and suicidal self-harm, and there is evidence to suggest that those who have engaged in self-harm have a greater tolerance for physical pain than those who have never engaged in the behavior (Glenn, Michel, Franklin, Hooley, & Nock, 2014; Orbach, Mikulincer, King, Cohen, & Stein, 1997). This may explain why some people are able to withstand the pain of the lethal methods necessary to die by suicide. Whether or not this reduced sensitivity to physical pain is a cause or a consequence of self-harm, however, is as yet unknown. Several ongoing studies within our research laboratory are currently exploring this, by directly comparing individuals reporting self-harm ideation only, with those who have engaged in self-harm. Psychological mediators of this relationship are also being examined. Investigating altered pain sensitivity may shed light on the neurobiological mechanisms that underlie self-harm's affective-regulatory function, and could provide critical insight into the role of endogenous opioids in self-harm (Kirtley, O'Carroll, & O'Connor, 2015b). A recent systematic review has highlighted the need for longitudinal research in this area (Kirtley, O'Carroll, & O'Connor, 2016).

Implications of the IMV Model for Research, Policy, and Practice

Although the IMV model, for the most part, specifies reflective processes (e.g., entrapment appraisals), consistent with a dual process approach (Strack & Deutsch, 2004), it also assumes that unconscious processes (e.g., attentional biases) have a key role in the development of suicidal thinking and behavior. Another key strength of the IMV model is that it provides clear opportunities for intervention, for example, by manipulation of TSMs in order to disrupt the path from defeat to entrapment. This has significant implications for policy and practice, where historically, many interventions have lacked a sound empirical evidence base. Indeed the policies and activities of a number of different suicide prevention organizations nationally and internationally, including Lifeline Australia (2013), Lifeline Northern Ireland (personal communication), Samaritans (Wyllie et al., 2012), and The Flemish Suicide Prevention Centre (VLESP, in preparation) have cited the IMV model as a key influence. For example, it has been highlighted by Lifeline Australia as an evidence-based framework for understanding suicidal behavior and for the development of interventions and treatments that can be targeted to specific phases of elevated risk (Lifeline Australia, 2013). In another example, the Flemish Suicide Prevention Expertise guidelines for health professionals (VLESP, in preparation) present the IMV model as a contextual framework for better understanding targets for intervening in the suicide process. These guidelines will be distributed to all mental health professionals throughout Flanders (Belgium). The IMV model has also been put forward as a useful framework on which to build public education programs in Sub-Saharan Africa (Atilola & Ayinde, 2015).

Conclusions

We have described the IMV model of suicidal behavior, which accounts for the complex interplay between biology, psychology, and social factors in the etiology and course of suicidal behavior. The IMV model builds on the empirical and conceptual evidence from other models and perspectives and is able to make differential predictions in respect of suicidal ideation/intent and behavior. The evidence for the validity of the model is growing (e.g., Dhingra et al., 2015; O'Connor et al., 2012) as is its utility as a framework to inform suicide prevention activities internationally (e.g., Australia, Belgium, Northern Ireland). The model needs to be further tested and refined to determine the extent to which factors associated with, for example, the motivational phase are phase specific. Further research should also investigate how variables within the IMV interact to produce differential outcomes, and determine whether some combinations of factors are more pernicious than others. It should be noted that we have included only a selection of likely moderators to illustrate the model; there are others that require further empirical attention. In addition, although we believe that factors such as social problem solving are primarily moderators of the defeat–entrapment–suicidality pathway, there may be occasions when they act as mediators being causally related to a preceding factor. It has also been suggested that defeat and entrapment are better represented as a single construct (Taylor, Wood, Gooding, Johnson, & Tarrier, 2009). Our sense is that they are distinct but overlapping constructs, in the same way that depression and hopelessness are correlated but have considerable discriminant validity. However, further investigation is required to disentangle the conceptualization of these constructs (i.e., what characterizes them) from their operationalization (i.e., how they are measured).

We need to further test each of the mediating and moderating pathways in turn to establish which factors are necessary and sufficient to lead to suicidal behavior. As suicidology has been dominated by the search for risk factors since its inception, greater emphasis should also be given to the further identification and promotion of protective factors. Indeed, the IMV model identifies three stages along the motivational-volitional pathway for potential intervention, not to mention numerous opportunities to ameliorate risk in the premotivational phase. For example, we could bolster social problem solving, thereby attenuating the defeat/humiliation–entrapment path, or we could increase positive future thinking in order to reduce the likelihood of developing suicidal ideation/intent following entrapment. In conclusion, the IMV model details an integrated theoretical framework that should stimulate further research questions as well as pointing to a range of potential opportunities to reduce the risk that the experience of emotional distress manifests itself as suicidal ideation and behavior.

Key Resources

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8. Suicidal Behaviour Research Laboratory (SBRL) website: www.suicideresearch.info; Twitter: @suicideresearch
9. Facebook: <https://www.facebook.com/suicidalbehaviourresearchlab>
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