

Chapter 11

Present status of the Integrated Motivational-Volitional Model of Suicidal Behaviour¹

Karen Wetherall, Seonaid Cleare, Tiago Zortea, Rory O'Connor
Suicidal Behaviour Research Laboratory, University of Glasgow, UK

Introduction

Suicide remains a major public health concern, with around 804,000 deaths per annum worldwide (World Health Organisation, 2014), yet our knowledge of the specific markers of risk is still relatively limited (Franklin et al., 2017). There is growing recognition that psychiatric disorders alone are insufficient to predict suicide risk, and therefore there is a need to move beyond mental disorders and adopt more sophisticated explanatory models of suicide; highlighting the complex interplay of risk and protective factors (O'Connor & Nock, 2014). In line with this, the Integrated-Motivational Volitional (IMV) model of suicidal behaviour incorporates major components from psychopathology, suicide research and the health psychology literature to delineate the final common pathway to suicidal ideation and suicidal behaviour (Figure 1; O'Connor, 2011; O'Connor et al., 2016; O'Connor & Kirtley, 2018). Specifically, the IMV model is a tri-partite (pre-motivational, motivational and volitional phases) diathesis-stress model that endeavours to understand the emergence of suicidal ideation and the transition from ideation to suicide attempt. In the present chapter, we provide a brief overview of the IMV model, its core premises and empirical status.

Pre-Motivational Phase: Background Variables and Triggering Events

The IMV model posits that the development of suicidal thoughts occurs in a biopsychosocial context, i.e., the pathways towards suicide risk are influenced by an interaction of biological, psychological and social factors; an exploratory premise that

¹ How to cite this book section:

Wetherall, K., Cleare, S., Zortea, T. C., & O'Connor, R. C. (2020). Status of the Integrated Motivational-Volitional Model of Suicidal Behaviour. In D. de Leo & V. Postuvan (Eds.), *Reducing the Toll of Suicide: Resources for Communities, Groups, and Individuals* (1st ed., pp. 169–184). Gottingen: Hogrefe Publishing.

establishes the IMV as a diathesis-stress framework (O'Connor, 2011; van Heeringen, 2012). The diathesis-stress hypothesis suggests that the development and course of a mental health issue results from the interaction between a diathesis (predispositional vulnerability) and stress often further exacerbated by contextual events or factors (Monroe & Simons, 1991).

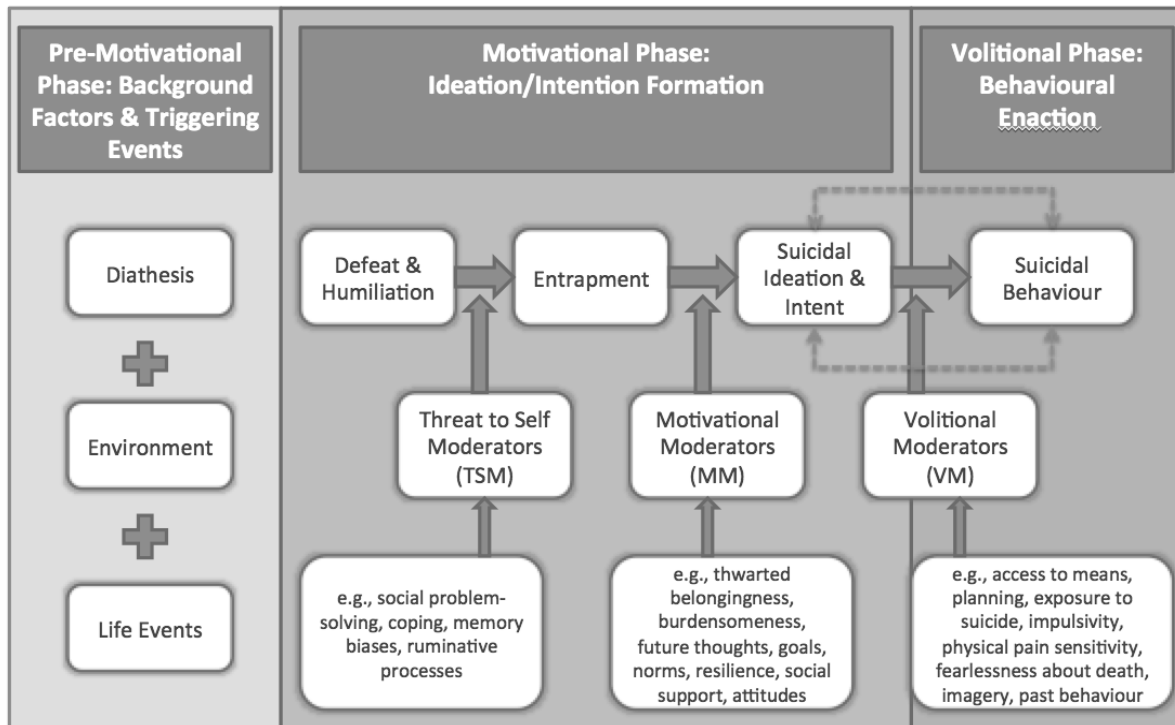


Figure 1: The integrated motivational-volitional model of suicidal behaviour (O'Connor & Kirtley, 2018)

Background Variables: The Role of Diathesis

The term *diathesis* has mainly been employed in the field of psychopathology to explain a genetic or physiological factor that conveys vulnerability to the organism, rendering it more likely to develop mental health issues if exposed to stressful environments or life events (Monroe & Simons, 1991). In the context of the IMV model, a vulnerability can take the form of biological (genetic or physiological) or psychological (cognitive, affective or personality traits) factors that, in interaction with contextual variables, increase suicide risk. On *biological* vulnerability, studies in the field of neurobiology and epigenetics, for example, have indicated that impairments in the stress response systems, particularly in the serotonergic and hypothalamic-pituitary-adrenal axis, are associated with increased vulnerability to suicide (Kamali, Oquendo, & Mann, 2001; Lutz, Mechawar, & Turecki, 2017; Van Heeringen & Mann, 2014; O'Connor et al., 2016). In fact, there is growing acknowledgement that external events, particularly during early life, may influence gene expression and the development of vulnerability for mental health issues and suicide risk later in life (Lutz et al., 2017). Recent evidence has supported the hypothesis that childhood trauma predicts blunted cortisol reactivity to stress and resting cortisol levels, such that higher levels of trauma seem to be

associated with lower cortisol levels in those with a suicidal history (O'Connor, Green, Ferguson, O'Carroll, & O'Connor, 2018).

Another type of diathesis is the *psychological* vulnerability characterised by personality and individual differences often developed in the context of adverse environmental circumstances, particularly during childhood and adolescence. It is known, for example, that socially prescribed perfectionism – believing that others hold unrealistically high expectations for one or one's behaviour (Hewitt & Flett, 1991) – is associated with suicidal thoughts and behaviours (Smith et al., 2017; O'Connor, 2007). Although evidence for its aetiology is limited, it has been suggested to develop in the context of inconsistent, absent, or conditional parental approval (Barrow & Moore, 1983). Similarly, insecure forms of attachment can emerge in the context of invalidating parental environments during childhood (Bowlby, 1988), and have been shown to work as vulnerability factors for suicidal ideation and suicide attempts later in life (Fergusson, Woodward, & Horwood, 2000; Wrath & Adams, 2018). Although psychological vulnerability factors are part of the pre-motivational phase, the IMV model proposes that such factors may also have an effect on the development of suicide risk during the motivational phase (O'Connor, 2011). For example, Venta and colleagues (2014) found that insecure forms of attachment were associated with suicidal ideation, mediated by thwarted belongingness (a motivational moderator within the IMV model), providing a demonstration of how pre-motivational variables may affect motivational factors, thereby increasing suicide risk.

Triggering Events: Environment and Life Events

Albeit that vulnerability factors are essential to understanding the aetiology of suicide risk, the stress-diathesis hypothesis (Monroe & Simons, 1991) posits that an individual with a given vulnerability may become suicidal (via motivational phase, i.e. defeat and entrapment), but is less likely to do so unless they are exposed to specific stress-inducing factors. These factors can be (i) environmental/social variables such as socioeconomic inequalities (Platt, 2016) including the impact of economic recessions (Chang, Stuckler, Yip, & Gunnell, 2013), and (ii) adverse life experiences both current (Bagge, Glenn, & Lee, 2012) or historical during childhood (Cleare et al., 2018).

Although socioeconomic disadvantage is associated with suicide, it has been suggested that relative social position, rather than absolute income, may be more important in understanding suicidal ideation and behaviour (Wetherall, Daly, Robb, Wood, & O'Connor, 2015). In this regard, Wetherall and colleagues (2018) found that making negative social comparisons may act as one mechanism whereby psychological vulnerability factors within the pre-motivational phase of the IMV model (e.g., social perfectionism) may influence factors within the motivational phase of the model (e.g., feeling defeated) to increase suicide risk.

Adverse life experiences have also been shown to be associated with suicide risk, regardless of when they occurred (Bagge et al., 2012; Cleare et al., 2018; O'Connor et al., 2018; O'Connor & Nock, 2014). For example, Cleare and collaborators (2018) found that patients admitted to hospital with repeat self-harm reported had experienced more episodes of traumatic events during childhood in comparison to

those who had presented with self-harm for the first time. More generally, early life adversities, such as sexual, physical or emotional maltreatment are known to contribute to the development of biological and psychological vulnerability by triggering changes in neurobiological systems and, therefore, potentially increasing sensitivity to negative life events later in adult life (Jeronimus, Ormel, Aleman, Penninx, & Riese, 2013; Sánchez, Ladd, & Plotsky, 2001). In fact, evidence shows that negative life events in adulthood, particularly of an interpersonal nature (e.g., relationship breakdown), are associated with risk of suicide attempt (Bagge et al., 2012), highlighting the triggering effects of stress on the development of suicide risk. Although the stress produced by environmental and life events is associated with suicide risk, not all individuals who are exposed to such environments, or who encounter stressful life events, develop suicide risk. Needless to say, it is the diathesis-stress interaction that is critical to understanding the pre-motivational phase of the IMV model. Such an interaction may increase the likelihood of an individual entering the motivational phase and developing suicidal thoughts via perceptions of defeat and entrapment.

Motivational Phase: The development of suicidal ideation

Defeat and entrapment are situated within the motivational phase and, along with humiliation, are posited to be the main protagonists in the emergence of suicidal ideation and intent. The motivational phase of the IMV model draws on Williams (2001)'s arrested flight model and focuses on the impact of defeat and humiliation which is perceived to be inescapable (entrapment) in the suicidal process. The IMV model extends Williams' basic premise by including moderating factors which may facilitate transitions along the pathway from defeat to the development of suicidal ideation and intent (O'Connor, 2011).

The pernicious association between defeat, entrapment and suicidal ideation is well documented (Siddaway, Taylor, Wood, & Schulz, 2015; Taylor, Gooding, Wood, & Tarrier, 2011). Although the majority of the research to-date has been cross-sectional, the few prospective studies also support this. This includes a previous study from our group, which found entrapment predicted hospital treated suicide attempts 4 years following the index suicide attempt (O'Connor, Smyth, Ferguson, Ryan, & Williams, 2013). Indeed, entrapment appears to have a particularly robust relationship with suicidal ideation (O'Connor and Portzky, 2018). Entrapment may stem from external factors (i.e., feel trapped in a job or relationship) or internal ruminations (i.e., feel trapped by your own self-critical thinking) (Gilbert and Allan, 1998). There is emerging evidence that internal entrapment may be particularly pertinent in relation to suicidal thinking over time, as in a sample of patients with bipolar disorder, internal entrapment mediated the relationship between defeat and suicidal ideation across a 4 month follow up (Owen, Dempsey, Jones, & Gooding, 2018). Similarly, in a representative sample of young people, the relationship between defeat and 12-month suicidal ideation was mediated by internal entrapment (Wetherall et al., 2019). Further research is required to explore this relationship, including a better understanding of how internal entrapment develops and the factors that may buffer its effects (O'Connor & Portzky, 2018).

The importance of identifying the motivational phase variables has been recently highlighted in the new Self-Harm and Suicide Prevention Competence Framework published in the UK by the National Collaborating Centre for Mental Health (2018). The framework is aimed at clinicians, trainers and commissioners of services, and describes various activities, based on research evidence, that should be brought together to support people who self-harm and/or are suicidal. Although we are aware of the antecedents that contribute to the development of suicidal ideation, research has highlighted the need for greater precision in understanding this relationship. In particular, in extending the focus to include how and under what circumstances these factors contribute to the aetiology and course of psychological distress and suicide risk (Franklin et al., 2017).

Threat to Self-Moderators

The initial part of the motivational pathway is influenced by threat-to-self moderators. The presence or absence of these increases or diminishes the potential for feelings of defeat to transition into feelings of entrapment. The threat-to-self moderators are characterised as cognitive processes which have a role in an individual's ability to cope with life situations. One such factor, autobiographical memory recall, for instance, is repeatedly implicated in the aetiology and course of depression and suicidality (Kuyken et al., 2006; Rasmussen et al., 2008; Thompson et al., 2005; Van Vreeswijk & De Wilde, 2004; Williams & Broadbent, 1986). Overgeneral memory recall, in particular, is related to impaired problem solving (Dudai & Carruthers, 2005; Williams & Broadbent, 1986) and impairments in coping strategies (Williams, Barnhofer, Crane, & Duggan, 2006). The development of overgeneral autobiographical recall is not yet fully understood, however, one hypothesis is that as suicidal ideation intensifies, overgeneral memories increase which, in turn, reduce the accessibility of adaptive coping strategies and biasing the valence of available memories leading to an over-representation of negative memories. These impairments, along with brooding rumination (Morrison & O'Connor, 2008; Tucker, O'Connor & Wingate, 2016), can lead to more intense feelings of burdensomeness and feelings of entrapment (Williams & Broadbent, 1986).

Motivational Moderators

The IMV model posits that the transition from entrapment to suicidal ideation is influenced by the presence or absence of motivational moderators. Indeed, the presence of protective motivational moderators such as reasons for living (Linehan, Goodstein, Nielsen, & Chiles, 1983), social support (Chang, Chan, & Yip, 2017) and realistic future thinking (Macleod, Pankhania, Lee, & Mitchell, 1997) have been shown to ameliorate feelings of entrapment as they provide potential alternatives to the current situation. We have previously found impaired positive future thinking was a key factor within the suicidal process (Hunter & O'Connor, 2003; O'Connor, Connery, & Cheyne, 2000; O'Connor, O'Connor, O'Connor, Smallwood, & Miles, 2004) and predicted suicidal ideation 2-3 months following an index self-harm episode (O'Connor et al., 2008). In particular, self-focussed (intrapersonal) positive future thinking (O'Connor, Smyth, & Williams, 2015) and the ability to shift goal directed behaviour in the face of unobtainable goals and engage with more obtainable ones (O'Connor,

O'Carroll, Ryan, & Smyth, 2012) are implicated in this relationship. Similarly, perceiving oneself as a burden on those around you and not belonging increases the likelihood that entrapment develops into suicidal ideation (Van Orden, 2015; O'Connor, 2011). In the recent update of the IMV model (O'Connor and Kirtley, 2018), resilience was included as a motivational moderator. This is consistent with a study by Wetherall and colleagues (2018) in which they found that entrapment mediated the defeat–suicide ideation relationship. Interestingly, though, resilience moderated the entrapment–suicidal ideation relationship such that suicide ideation was highest in the presence of high entrapment and low resilience.

There is a growing body of research that supports the utility of the IMV model in differentiating between individuals who experience suicidal ideation and those who attempt suicide. As predicted by the IMV model, motivational phase variables are not key in distinguishing between the latter two groups, whereas those who experience suicide ideation and those who have attempted suicide are more likely to differ in the volitional phase moderators (Dhingra et al., 2015; O'Connor et al., 2012; Wetherall et al., 2018).

The volitional phase: Making the transition from ideation to action

The final phase of the IMV model delineates the factors that aid the transition from suicidal ideation to a suicide attempt. It is evident that not everyone who thinks about suicide will go on to act on those thoughts (Kessler et al., 2005), and many of the established risk factors currently do not distinguish between those who think about suicide from those who will make a suicide attempt (May & Klonsky, 2016). Identifying these factors is crucial, particularly as around 60% of transitions from suicidal ideation to making a suicide attempt occur within a year of onset of ideation (Nock et al., 2008). Therefore, a central tenant of the IMV model is that the processes associated with the development of suicidal ideation and the transition to an attempt are distinct, consistent with ideation-to-action framework (Klonsky et al., 2017). As such, the IMV model specifies eight volitional moderators (VMs) that act to bridge the gap between thinking and acting, thereby increasing the risk of a suicide attempt (O'Connor, 2011; O'Connor & Kirtley, 2018). Importantly, these factors are potentially modifiable, and therefore may be useful targets for psychosocial interventions in the treatment of at risk individuals.

Volitional Moderators

In the 2018 update of the IMV model, the eight VMs that may govern the transition from suicidal ideation to a suicide attempt were specified in more detail than had been previously done so (Figure 2; O'Connor & Kirtley, 2018). From an environmental perspective, having access to the means for suicide is associated with increased suicide risk (Hawton et al., 2012). Indeed, a recent retrospective mortality study found that those in occupations with greater access to potentially lethal means for suicide (e.g., firearm, medicines) had higher suicide rates than those in occupations without access to lethal means, and this was particularly evident for females (Milner et al., 2017). Additionally, having formulated a plan for suicide increases the likelihood of making the transition from suicidal thoughts to a suicide attempt (Kessler et al., 1999). In line with

this, a network analysis of the items of the Beck Scale for Suicide Ideation (Beck et al., 1979) indicated that volitional items, particularly those related to expectancy, preparation and planning of a suicide attempt, were most strongly associated with repetition of suicidal behaviour at 15 months than motivational phase items (de Beurs et al., 2017). This may be related to the concept of implementation intentions, whereby making 'if-then' plans increases the attainment of goals and behaviours by increasing the automatic accessibility of the method of implementation (Gollwitzer & Sheeran, 2006).

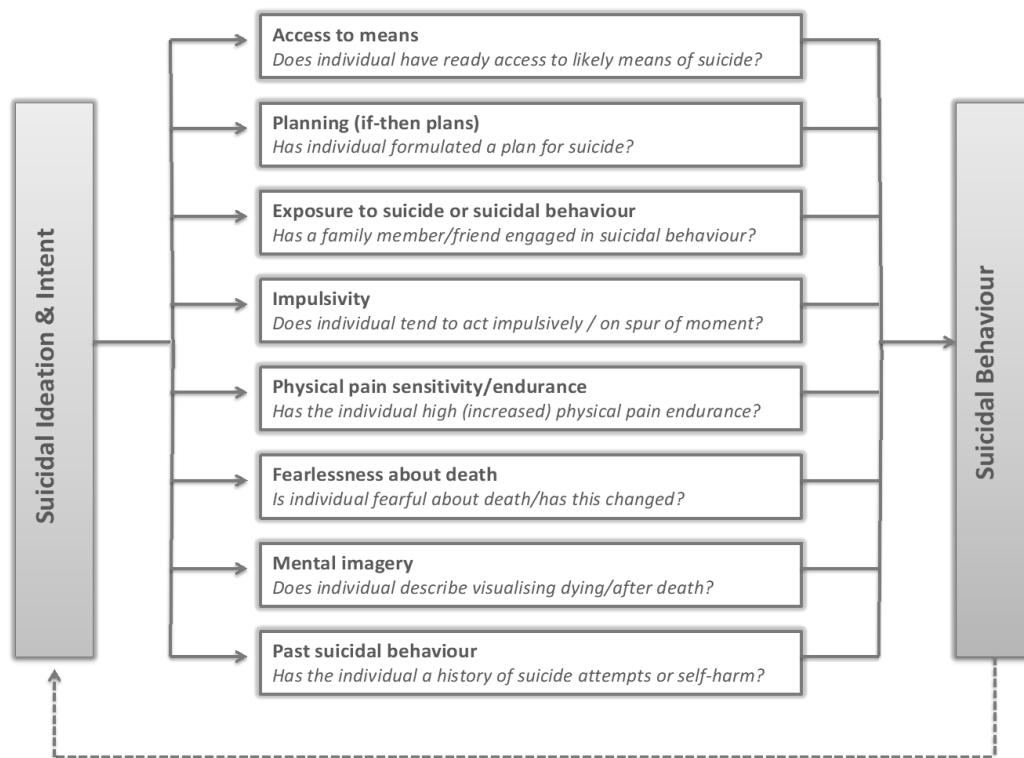


Figure 2: The Volitional Moderators within the IMV model (O'Connor and Kirtley, 2018)

A more recent addition to the list of VMs is mental imagery about suicide/death; as those experiencing mental imagery, or suicidal 'flash forwards', have been found to have increased suicide risk (Holmes et al., 2007). Arguably this may bridge the 'intention-suicidal behaviour' gap for similar reasons to planning, as it may act as cognitive rehearsal for the suicidal behaviour (O'Connor & Kirtley, 2018). Research evidence indicates that such images may represent a novel target for intervention, given that the interaction between mental imagery and feelings of entrapment predicted suicidal ideation over seven weeks (Ng et al., 2016). Furthermore, exposure to the suicide or suicidal behaviour of family or friends also incurs an increased risk of suicide (O'Connor et al., 2014); indeed bereavement by suicide is a specific risk factor for a suicide attempt in young people who have experienced a sudden bereavement (by suicide or other) (Pitman et al., 2016). Similarly, in a large birth cohort study, adolescents who had made a suicide attempt were up to five times more likely to have been exposed to self-harm by both family and friends compared to those who had experienced suicidal ideation only (Mars et al., 2018). It is proposed that by increasing

the cognitive availability of the behaviour, as well as its acceptability, exposure may make imitation of suicidal behaviour more likely.

One factor that is consistent across the models that fit into the ideation-to-action framework is the idea of acquiring the capability for suicide (Joiner, 2005; Klonsky & May, 2015b). It is argued that in order to override self-preservation reflexes, an individual must have a reduced sensitivity to pain and a fearlessness about death (Joiner, 2005). Indeed, a review of the literature found a consistent relationship between lower physical pain sensitivity and self-harm across a variety of samples, although it highlighted the need for more rigorous research (Kirtley et al., 2016). In addition, a systematic review (Ma et al., 2016) and meta-analysis (Chu et al., 2017) found that acquired capability was only weakly associated with suicide attempts, although arguably it was often assessed by proxy measures of acquired capability (e.g., having made a past suicide attempt). A measure of acquired capability that primarily focusses upon a sense of fearlessness about death has been developed (Van Orden et al., 2008), and this has been shown to interact with feelings of agitation to increase suicide risk in a military sample (Ribeiro et al., 2015). Therefore, there may be advantages in assessing perceived fearlessness about death in those at increased suicide risk. What is more, there is evidence that individuals who are experiencing suicidal ideation exhibit an implicit fearlessness of death, as measured by the Implicit Relational Assessment Procedure (IRAP), which taps evaluations about death (Hussey et al., 2016).

The extent to which someone is impulsive may also increase an individual's capability for suicide, as impulsive individuals may be more often exposed to painful experiences (Anestis et al., 2014). High levels of impulsivity have long been recognised as an individual risk factor for suicide (Mann et al., 1999), but more recent research has identified methodological issues around how it is operationalised; emphasising discrepancies between impulsivity as a trait and the impulsive nature of a suicide act (Gvion and Apter, 2011; Klonsky & May, 2015a). Indeed, a meta-analysis revealed a relatively small effect size for the relationship between impulsivity and suicide (Anestis et al., 2014). However, there may be some benefit in distinguishing between trait impulsivity that is functional (e.g., adventurousness) versus dysfunctional (e.g., disorderliness), as the latter has been shown to be a significant risk factor for a suicide attempt (Liu et al., 2017). Consistent with this view, a new meta-analysis has found a consistent relationship between impaired decision-making and suicidal behaviour, so it may be that this relationship reflects a dysfunctional aspect of impulsivity (Rios Salinas et al., in draft). Finally, a history of suicidal behaviour (even one past suicide attempt) is associated with an increased risk of repetition (Hawton et al., 2012), and it is often the strongest predictor of a future suicide attempt (O'Connor et al., 2013).

Direct tests of the IMV model's volitional factors

Although there have been a growing number of studies testing components of the IMV model, a few have directly tested how those who have had thoughts of suicide (but never attempted suicide) differ from those who have made a suicide attempt on established suicide risk factors (i.e., motivational and volitional factors). In an adolescent sample, along with stress, a number of VMs distinguished between those

who had thoughts of self-harm and those who had enacted self-harm; these VMs included self-harm by friends, thoughts of peers' self-harm as well as impulsivity (O'Connor et al., 2012). A further study found that, with students, only VMs (fearlessness about death, exposure to suicide in others and impulsivity) distinguished between those who had suicidal thoughts compared to those who had made a suicide attempt, whereas no motivational phase variables differentiated between the groups (Dhingra et al., 2015).

In a more recent cohort study with adolescents, exposure to self-harm in others, along with psychiatric disorder, differentiated between those who had made a suicide attempt and those who had experienced suicidal thoughts only (Mars et al., 2018). Finally, in the most comprehensive test of the volitional phase of the model to date, young people who had made a suicide attempt reported significantly higher levels of acquired capability, trait impulsivity, mental images of death and they were more likely to have had a friend who had made a suicide attempt, compared to those who had experienced suicidal thoughts only (Wetherall et al., 2018). Further, there were no significant differences between these two groups on any of the motivational phase variables (e.g., defeat and entrapment), nor on depressive symptoms. Although these findings require further prospective study to establish causality, thus far there has been growing support for the centrality of the volitional factors in distinguishing between those who think about suicide and those to attempt or die by suicide.

Conclusions

This chapter provided a brief overview of the current evidence base in support of the IMV model. Since its initial publication in 2011, there has been increasing support for the main facets of the model, with a recent focus on the model's postulations about the factors that govern the transition between the model's phases. Although evidence is growing, there are still some gaps in the literature which require attention. Primarily, prospective evidence of how suicide risk progresses over time would be advantageous. Additionally, identifying how these factors can be incorporated into risk assessments and treatment interventions is crucial.

References

- Anestis, M.D., Soberay, K.A., Gutierrez, P.M., Hernandez, T.D., Joiner, T.E., 2014. Reconsidering the link between impulsivity and suicidal behavior. *Personality and social psychology review : an official journal of the Society for Personality and Social Psychology, Inc* 18, 366-386.
- Bagge, C. L., Glenn, C. R., & Lee, H.-J. (2012). Quantifying the Impact of Recent Negative Life Events on Suicide Attempts. *Journal of Abnormal Psychology*, 122(2), 359–368. <https://doi.org/10.1037/a0030371>
- Barrow, J. C., & Moore, C. A. (1983). Group interventions with perfectionistic thinking. *The Personnel and Guidance Journal*, 61(10), 612–615. <https://doi.org/10.1111/j.2164-4918.1983.tb00008.x>
- Beck, A.T., Kovacs, M., Weissman, A., 1979. Assessment of suicidal intention: the Scale for Suicide Ideation. *Journal of consulting and clinical psychology* 47, 343
- Bowlby, J. (1988). Developmental psychiatry comes of age. *American Journal of Psychiatry*, 145(1), 1–10. <https://doi.org/10.1176/ajp.145.1.1>
- Chang, S. Sen, Stuckler, D., Yip, P., & Gunnell, D. (2013). Impact of 2008 global economic crisis on suicide: Time trend study in 54 countries. *BMJ*, 347(7925), f5239. <https://doi.org/10.1136/bmj.f5239>
- Chang, Q., Chan, C. H., & Yip, P. S. F. (2017). A meta-analytic review on social relationships and suicidal ideation among older adults. *Social Science and Medicine*, 191, 65–76. <https://doi.org/10.1016/j.socscimed.2017.09.003>
- Chu, C., Buchman-Schmitt, J.M., Stanley, I.H., Hom, M.A., Tucker, R.P., Hagan, C.R., Rogers, M.L., Podlogar, M.C., Chiurliza, B., Ringer, F.B., Michaels, M.S., Patros, C.H.G., Joiner, T.E., 2017. The interpersonal theory of suicide: A systematic review and meta-analysis of a decade of cross-national research. *Psychol Bull* 143, 1313-1345.
- Cleare, S., Wetherall, K., Clark, A., Ryan, C., Kirtley, O., Smith, M., & O'Connor, R. (2018). Adverse Childhood Experiences and Hospital-Treated Self-Harm. *International Journal of Environmental Research and Public Health*, 15(6), 1235. <https://doi.org/10.3390/IJERPH15061235>
- Fergusson, D. M., Woodward, L. J., & Horwood, L. J. (2000). Risk factors and life processes associated with the onset of suicidal behaviour during adolescence and early adulthood. *Psychological Medicine*, 30(1), 23–39. <https://doi.org/10.1017/S003329179900135X>
- de Beurs, D.P., van Borkulo, C.D., O'Connor, R.C., 2017. Association between suicidal symptoms and repeat suicidal behaviour within a sample of hospital-treated suicide attempters. *BJPsych open* 3, 120-126.
- Dhingra, K., Boduszek, D., & O'Connor, R. C. (2015). Differentiating suicide attempters from suicide ideators using the Integrated Motivational-Volitional model of suicidal behaviour. *Journal of Affective Disorders*, 186, 211–218. <https://doi.org/10.1016/j.jad.2015.07.007>
- Dudai, Y., & Carruthers, M. (2005). The followership effect: Charismatic oratory, hypnoidal and altered states of consciousness. *PQDT - UK & Ireland*, 434(March), 567. <https://doi.org/10.1038/434567a>
- Franklin, J. C., Ribeiro, J. D., Fox, K. R., Bentley, K. H., Kleiman, E. M., Huang, X., ... Nock, M. K. (2017). Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological Bulletin*, 143(2), 187–232. <https://doi.org/10.1037/bul0000084>
- Gilbert, P., & Allan, S. (1998). The role of defeat and entrapment (arrested flight) in depression: An exploration of an evolutionary view. *Psychological Medicine*, 28(3), 585-598.
- Gollwitzer, P.M., Sheeran, P., 2006. Implementation Intentions and Goal Achievement: A Meta-analysis of Effects and Processes, *Advances in Experimental Social Psychology*. Academic Press, pp. 69-

- Gvion, Y., Apter, A., 2011. Aggression, impulsivity, and suicide behavior: a review of the literature. *Archives of suicide research : official journal of the International Academy for Suicide Research* 15, 93-112.
- Hawton, K., Saunders, K.E., O'Connor, R.C., 2012. Self-harm and suicide in adolescents. *Lancet* 379, 2373-2382.
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, 60(3), 456–470. <https://doi.org/10.1037/0022-3514.60.3.456>
- Holmes, E.A., Crane, C., Fennell, M.J., Williams, J.M., 2007. Imagery about suicide in depression--"Flash-forwards"? *Journal of behavior therapy and experimental psychiatry* 38, 423-434
- Hunter, E. , & O'Connor, R. . (2003). Hopelessness and future thinking in parasuicide: the role of perfectionism. *British Journal of Clinical Psychology*, 42(4), 355–365.
- Hussey, I., Barnes-Holmes, D., Booth, R., 2016. Individuals with current suicidal ideation demonstrate implicit "fearlessness of death". *Journal of behavior therapy and experimental psychiatry* 51, 1-9.
- Joiner, T., 2005. *Why people die by suicide*. Harvard University Press.
- Jeronimus, B. F., Ormel, J., Aleman, A., Penninx, B. W. J. H., & Riese, H. (2013). Negative and positive life events are associated with small but lasting change in neuroticism. *Psychological Medicine*, 43(11), 2403–2415. <https://doi.org/10.1017/S0033291713000159>
- Kamali, M., Oquendo, M. A., & Mann, J. J. (2001). Understanding the neurobiology of suicidal behavior. *Depression and Anxiety*, 14(3), 164–176. <https://doi.org/10.1002/da.1062>
- 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, 617-626.
- Kessler RC, Chiu WT, Demler O, Walters EE. Prevalence, Severity, and Comorbidity of 12-Month DSM-IV Disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62(6):617–627. doi:10.1001/archpsyc.62.6.617
- Kirtley, O.J., O'Carroll, R.E., O'Connor, R.C., 2016. Pain and self-harm: A systematic review. *J Affect Disord* 203, 347-363.
- Klonsky, D., May, A., 2015a. Impulsivity and Suicide Risk: Review and Clinical Implications, *Psychiatric Times*.
- Klonsky, E.D., May, A.M., 2015b. The Three-Step Theory (3ST): A New Theory of Suicide Rooted in the "Ideation-to-Action" Framework. *International Journal of Cognitive Therapy* 8, 114-129.
- Klonsky, E.D., Saffer, B.Y., Bryan, C.J., 2017. Ideation-to-Action Theories of Suicide: A Conceptual and Empirical Update. *Current Opinion in Psychology*.
- Kuyken, W., Howell, R., & Dalgleish, T. (2006). Overgeneral autobiographical memory in depressed adolescents with, versus without, a reported history of trauma. *Journal of Abnormal Psychology*. Kuyken, Willem: Mood Disorders Centre, School of Psychology, University of Exeter, Exeter, England, EX4 4QG, w.kuyken@exeter.ac.uk: American Psychological Association. <https://doi.org/10.1037/0021-843X.115.3.387>
- Linehan, M. M., Goodstein, J. L., Nielsen, S. L., & Chiles, J. A. (1983). Reasons for staying alive when you are thinking of killing yourself: The Reasons for Living Inventory. *Journal of Consulting and Clinical Psychology*. US: American Psychological Association. <https://doi.org/10.1037/0022-006X.51.2.276>
- Liu, Y.Y., Wang, X.T., Qiu, H.M., Xu, A.Q., Jia, C.X., 2017. Functional and dysfunctional impulsivity and attempted suicide in rural China: A paired case-control study. *Psychiatry Res* 253, 22-27.

- Lutz, P.-E., Mechawar, N., & Turecki, G. (2017). Neuropathology of suicide: recent findings and future directions. *Molecular Psychiatry*, 22(10), 1395–1412. <https://doi.org/10.1038/mp.2017.141>
- Ma, J., Batterham, P.J., Calear, A.L., Han, J., 2016. A systematic review of the predictions of the Interpersonal-Psychological Theory of Suicidal Behavior. *Clin Psychol Rev* 46, 34-45.
- Macleod, A. K., Pankhania, B., Lee, M., & Mitchell, D. (1997). Parasuicide, depression and the anticipation of positive and negative future experiences. *Psychological Medicine*, 27(4), 973–977. <https://doi.org/10.1017/S003329179600459X>
- Mann, J.J., Wateraux, C., Haas, G.L., Malone, K.M., 1999. Toward a clinical model of suicidal behavior in psychiatric patients. *Am J Psychiatry* 156, 181-189.
- Mars, B., Heron, J., Klonsky, E.D., Moran, P., O'Connor, R.C., Tilling, K., Wilkinson, P., Gunnell, D., 2018. What distinguishes adolescents with suicidal thoughts from those who have attempted suicide? A population-based birth cohort study. *Journal of Child Psychology and Psychiatry*.
- May, A.M., Klonsky, E.D., 2016. What Distinguishes Suicide Attempters From Suicide Ideators? A Meta-Analysis of Potential Factors. *Clinical Psychology: Science and Practice* 23, 5-20.
- Milner, A., Witt, K., Maheen, H., LaMontagne, A.D., 2017. Access to means of suicide, occupation and the risk of suicide: a national study over 12 years of coronial data. *BMC Psychiatry* 17, 125.
- Monroe, S. M., & Simons, A. D. (1991). Diathesis-stress theories in the context of life stress research: Implications for the depressive disorders. *Psychological Bulletin*, 110(3), 406–425. <https://doi.org/10.1037/0033-2909.110.3.406>
- Morrison, R., & O'Connor, R. C. (2008). A Systematic Review of the Relationship Between Rumination and Suicidality. *Suicide and Life-Threatening Behavior*, 38(5), 523–538. <https://doi.org/10.1521/suli.2008.38.5.523>
- Ng, R.M.K., Di Simplicio, M., McManus, F., Kennerley, H., Holmes, E.A., 2016. 'Flash-forwards' and suicidal ideation: A prospective investigation of mental imagery, entrapment and defeat in a cohort from the Hong Kong Mental Morbidity Survey. *Psychiatry Res* 246, 453-460.
- Nock, M.K., Borges, G., Bromet, E.J., Alonso, J., Angermeyer, M., Beautrais, A., Bruffaerts, R., Chiu, W.T., de Girolamo, G., Gluzman, S., de Graaf, R., Gureje, O., Haro, J.M., Huang, Y., Karam, E., Kessler, R.C., Lepine, J.P., Levinson, D., Medina-Mora, M.E., Ono, Y., Posada-Villa, J., Williams, D., 2008. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *The British Journal of Psychiatry* 192, 98.
- O'Connor, R.C. (2007). The relations between perfectionism and suicide risk: A systematic review. *Suicide and Life-Threatening Behavior*, 37, 698-714
- O'Connor, D. B., Green, J. A., Ferguson, E., O'Carroll, R. E., & O'Connor, R. C. (2018). Effects of childhood trauma on cortisol levels in suicide attempters and ideators. *Psychoneuroendocrinology*, 88, 9–16. <https://doi.org/10.1016/j.psyneuen.2017.11.004>
- O'Connor, R. C. (2011). Towards an Integrated Motivational-Volitional Model of Suicidal Behaviour. In R. C. O'Connor, S. Platt, & J. Gordon (Eds.), *International Handbook of Suicide Prevention* (1st ed., pp. 181–198). Chichester, UK: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781119998556.ch11>
- O'Connor, R. C., Cleare, S., Eschle, S., Wetherall, K., & Kirtley, O. J. (2016). The Integrated Motivational-Volitional Model of Suicidal Behavior: An Update. In R. C. O'Connor & J. Pirks (Eds.), *The International Handbook of Suicide Prevention: Second Edition* (2nd ed., pp. 220–240). Chichester, UK: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118903223.ch13>
- O'Connor, R. C., & Kirtley, O. J. (2018). The integrated motivational–volitional model of suicidal behaviour. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 373(1754), 20170268. <https://doi.org/10.1098/rstb.2017.0268>
- O'Connor, R.C., Portzky, G. (2018). The relationship between entrapment and suicidal behavior through

- the lens of the integrated motivational–volitional model of suicidal behavior. *Current Opinion in Psychology* 2018, 22:12–17.
- O'Connor, R. C., & Nock, M. K. (2014). The psychology of suicidal behaviour. *The Lancet Psychiatry*, 1(1), 73–85. [https://doi.org/10.1016/S2215-0366\(14\)70222-6](https://doi.org/10.1016/S2215-0366(14)70222-6)
- 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. <https://doi.org/https://doi.org/10.1016/j.jad.2012.04.035>
- O'Connor, R. C., O'Connor, D. B., O'Connor, S. M., Smallwood, J., & Miles, J. (2004). Hopelessness, stress, and perfectionism: The moderating effects of future thinking. *Cognition and Emotion*, 18(8), 1099–1120. <https://doi.org/10.1080/02699930441000067>
- O'Connor, R. C., Rasmussen, S., & 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. <https://doi.org/10.1192/bjp.bp.111.097808>
- 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. <https://doi.org/10.1037/a0033751>
- O'Connor, R. C., Smyth, R., & Williams, J. M. G. (2015). Intrapersonal Positive Future Thinking Predicts Repeat Suicide Attempts in Hospital-Treated Suicide Attempters. *Journal of Consulting and Clinical Psychology*, 83(1), 169–176. <https://doi.org/10.1037/a0037846>
- Owen, R., Dempsey, R., Jones, S., & Gooding, P. (2018). Defeat and Entrapment in Bipolar Disorder: Exploring the Relationship with Suicidal Ideation from a Psychological Theoretical Perspective. *Suicide and Life-Threatening Behavior*, 48(1), 116–128. <https://doi.org/10.1111/sltb.12343>
- Pitman, A.L., Osborn, D.P.J., Rantell, K., King, M.B., 2016. Bereavement by suicide as a risk factor for suicide attempt: a cross-sectional national UK-wide study of 3432 young bereaved adults. *BMJ Open* 6, e009948.
- Platt, S. (2016). Inequalities and suicidal behavior. In R. C. O'Connor & J. Pirkis (Eds.), *International Handbook of Suicide Prevention* (2nd ed., pp. 258–283). Chichester: John Wiley & Sons.
- Rasmussen, S. A., O'Connor, R. C., & Brodie, D. (2008). The role of perfectionism and autobiographical memory in a sample of parasuicide patients an exploratory study. *Crisis*, 29(2), 64–72. <https://doi.org/10.1027/0227-5910.29.2.64>
- Ribeiro, J.D., Bender, T.W., Buchman, J.M., Nock, M.K., Rudd, M.D., Bryan, C.J., Lim, I.C., Baker, M.T., Knight, C., Gutierrez, P.M., Joiner, T.E., Jr., 2015. An investigation of the interactive effects of the capability for suicide and acute agitation on suicidality in a military sample. *Depress Anxiety* 32, 25–31.
- Rios Salinas, M.A., Evans, J., O'Connor, R.C., (in draft). A Systematic Review and Meta-Analysis of Decision-Making and Suicidal Behaviour.
- Sánchez, M. M., Ladd, C. O., & Plotsky, P. M. (2001). Early adverse experience as a developmental risk factor for later psychopathology: Evidence from rodent and primate models. *Development and Psychopathology*, 13(3), 419–449. <https://doi.org/10.1017/S0954579401003029>
- Siddaway, A. P., Taylor, P. J., Wood, A. M., & Schulz, J. (2015). A meta-analysis of perceptions of defeat and entrapment in depression, anxiety problems, posttraumatic stress disorder, and suicidality. *Journal of Affective Disorders*, 184, 149–159. <https://doi.org/10.1016/j.jad.2015.05.046>
- Smith, M. M., Sherry, S. B., Chen, S., Saklofske, D. H., Mushquash, C., Flett, G. L., & Hewitt, P. L. (2017). The perniciousness of perfectionism: A meta-analytic review of the perfectionism-suicide relationship. *Journal of Personality*, 86(3), 522–542. <https://doi.org/10.1111/jopy.12333>
- Taylor, P. J., Gooding, P., Wood, A. M., & Tarrier, N. (2011). The role of defeat and entrapment in depression, anxiety, and suicide. *Psychological Bulletin*. Taylor, Peter James: School of

Psychological Sciences, University of Manchester,, Zochonis Building, Second Floor, Oxford Road, Manchester, England, M139PL, p.j.taylor@postgrad.manchester.ac.uk: American Psychological Association. <https://doi.org/10.1037/a0022935>

- Thompson, L. Y., Snyder, C. R., Hoffman, L., Michael, S. T., Rasmussen, H. N., Billings, L. S., ... Roberts, D. E. (2005). Dispositional forgiveness of self, others, and situations. *Journal of Personality*, 73(2), 313–359. <https://doi.org/10.1111/j.1467-6494.2005.00311.x>
- Tucker, R. P., O'Connor, R. C., & Wingate, L. R. R. (2016). An Investigation of the Relationship Between Rumination Styles, Hope, and Suicide Ideation Through the Lens of the Integrated Motivational-Volitional Model of Suicidal Behavior. *Archives of Suicide Research*, 20(4), 553–566. <https://doi.org/10.1080/13811118.2016.1158682>
- van Heeringen, K. (2012). Stress-Diathesis Model of Suicidal Behavior. In Y. Dwivedi (Ed.), *The Neurobiological Basis of Suicide* (1st ed., pp. 113–123). Boca Raton: CRC Press.
- Van Heeringen, K., & Mann, J. J. (2014). The Neurobiology of Suicide. *The Lancet Psychiatry*, 1(1), 63–72. [https://doi.org/10.1016/S2215-0366\(14\)70220-2](https://doi.org/10.1016/S2215-0366(14)70220-2)
- 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, 72-83.
- Van Orden, K. A. (2015). The Interpersonal Theory of Suicide: A useful theory? *Advancing the Science of Suicidal Behavior: Understanding and Intervention.*, 117(2), 41-52. <https://doi.org/10.1037/a0018697>.The
- Van Vreeswijk, M. F., & De Wilde, E. J. (2004). Autobiographical memory specificity, psychopathology, depressed mood and the use of the Autobiographical Memory Test: A meta-analysis. *Behaviour Research and Therapy*, 42(6), 731–743. [https://doi.org/10.1016/S0005-7967\(03\)00194-3](https://doi.org/10.1016/S0005-7967(03)00194-3)
- Venta, A., Mellick, W., Schatte, D., & Sharp, C. (2014). Preliminary Evidence that Thoughts of Thwarted Belongingness Mediate the Relations Between Level of Attachment Insecurity and Depression and Suicide-Related Thoughts in Inpatient Adolescents. *Journal of Social & Clinical Psychology*, 33(5), 428–447. <https://doi.org/10.1521/jscp.2014.33.5.428>
- Wetherall, K., Daly, M., Robb, K. A., Wood, A. M., & O'Connor, R. C. (2015). Explaining the income and suicidality relationship: income rank is more strongly associated with suicidal thoughts and attempts than income. *Social Psychiatry and Psychiatric Epidemiology*, 50(6), 929–937.
- Wetherall, K., Robb, K. A., & O'Connor, R. C. (2018). An Examination of Social Comparison and Suicide Ideation Through the Lens of the Integrated Motivational-Volitional Model of Suicidal Behavior. *Suicide and Life-Threatening Behavior*. <https://doi.org/10.1111/sltb.12434>
- Wetherall, K., Cleare, S., Eschle, S., Ferguson, E., O'Connor, D.B., O'Carroll, R.E., O'Connor, R.C., 2018. From ideation to action: Differentiating between those who think about suicide and those who attempt suicide in a national study of young adults. *J Affect Disord* 241, 475-483.
- Wetherall, K., Cleare, S., Eschle, S., Ferguson, E., O'Connor, D.B., O'Carroll, R.E., O'Connor, R.C. (under review). Predicting suicidal ideation in a representative sample of young people using components of two key models of suicidal behaviour.
- Williams, J. M., & Broadbent, K. (1986). Autobiographical memory in suicide attempters. *Journal of Abnormal Psychology*. US: American Psychological Association. <https://doi.org/10.1037/0021-843X.95.2.144>
- Wrath, A. J., & Adams, G. C. (2018). Self-injurious behaviours and adult attachment: A review of the literature. *Archives of Suicide Research*, 1–43. <https://doi.org/10.1080/13811118.2018.1486251>