

## Suicide 2



# The psychology of suicidal behaviour

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The causes of suicidal behaviour are not fully understood; however, this behaviour clearly results from the complex interaction of many factors. Although many risk factors have been identified, they mostly do not account for why people try to end their lives. In this Review, we describe key recent developments in theoretical, clinical, and empirical psychological science about the emergence of suicidal thoughts and behaviours, and emphasise the central importance of psychological factors. Personality and individual differences, cognitive factors, social aspects, and negative life events are key contributors to suicidal behaviour. Most people struggling with suicidal thoughts and behaviours do not receive treatment. Some evidence suggests that different forms of cognitive and behavioural therapies can reduce the risk of suicide reattempt, but hardly any evidence about factors that protect against suicide is available. The development of innovative psychological and psychosocial treatments needs urgent attention.

### Introduction

Suicide is the 14th leading cause of death worldwide, responsible for 1.5% of all mortality. Although psychological factors such as risk taking and decision making can affect the risk of other causes of death (eg, heart disease and cancer), suicide is perhaps the cause of death most directly affected by psychological factors, because a person makes a conscious decision to end his or her own life. Therefore, understanding of suicide and development of methods to predict and prevent its occurrence are the responsibility of psychologists, psychiatrists, and related mental health professionals. Earlier reports have provided general reviews of the problem of suicide.<sup>1,2</sup> In this Review, we assess and synthesise existing knowledge about the psychology of suicidal behaviour, including psychological theories of suicidal behaviour, risk and protective factors, psychological interventions, and key directions for psychological research into this important topic.

The purpose of this Review is to provide a summary of some of the most exciting and (in our view) important findings about the psychology of suicidal behaviour. Notably, space constraints preclude us from attending to the full breadth of psychological factors that can contribute to suicidal behaviour, and the full depth of what is known at present (panel 1); this Review is not a final exhaustive report of existing knowledge, but instead an introduction to the psychological factors involved in suicide. Although the specialty has grown substantially in the past few decades, most psychological scientific research thus far has focused on suicide ideation and suicide attempts rather than deaths by suicide.

### Epidemiology

Investigators of an epidemiological study<sup>3</sup> of suicidal behaviour in 17 countries documented the lifetime prevalence of suicide ideation (9.2%), plans (3.1%), and non-lethal attempts (2.7%). Prevalence estimates vary widely by country; however, once present, the characteristics of suicidal behaviour are quite consistent across

different countries. For example, the onset of suicide ideation increases strikingly during adolescence in every country studied.<sup>3</sup> Additionally, cross-nationally, about a third of people who think about suicide will go on to make a suicide attempt, and more than 60% of these transitions occur during the first year after initial onset of suicide ideation.<sup>3</sup> This finding is consistent with a continuum approach, with suicide risk increasing as an individual moves through ideation and planning to attempts.<sup>4</sup>

### Multifactorial causes and the role of psychiatric disorders

The causes of suicidal behaviour are not fully understood; however, this behaviour clearly results from complex interaction of many different factors. The risk of non-fatal suicidal behaviour is increased in young people, women (who have higher rates of non-lethal suicidal behaviour than do men, although men are more likely to die by suicide), people who are unmarried, and people who are socially disadvantaged (eg, low income and education, or unemployed).<sup>1,2</sup> Although a range of risk factors for suicidal behaviour has been identified, how or

#### Panel 1: Terminology

Suicide is the act of an individual intentionally ending their own life. We use the general term suicidal behaviour to refer to thoughts and behaviours related to an individual intentionally taking their own life. These thoughts include the more specific outcomes of suicide ideation, which refers to an individual having thoughts about intentionally taking their own life; suicide plan, which refers to the formulation of a specific plot by an individual to end their own life; and suicide attempt, which refers to engagement in a potentially self-injurious behaviour in which there is at least some intention of dying as a result of the behaviour. We also refer to self-harm, defined by the National Institute for Health and Care Excellence as intentional self-poisoning or self-injury, irrespective of motive.

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This is the second in a Series of three papers about suicide

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why these factors work together to increase the risk of this behaviour is not clear. Perhaps the most widely studied risk factor for suicidal behaviour is the presence of a previous psychiatric disorder. Findings from psychological autopsy studies<sup>5</sup> suggest that more than 90% of people who die by suicide have a psychiatric disorder before their death. On balance, however, most people with a psychiatric disorder never become suicidal (ie, experience suicidal thoughts, make suicide attempts, or die by suicide). For instance, less than 5% of people admitted to hospital for treatment of an affective disorder die by suicide;<sup>6</sup> most people with a psychiatric disorder will not die by suicide, nor will they experience suicidal behaviour. Thus, although the presence and accumulation of psychiatric disorders are risk factors for suicidal behaviour, they have little predictive power, and perhaps more importantly do not account for why people try to kill themselves. For this reason, more specific markers of suicide risk need to be identified. Psychological science is well placed to advance the understanding of why some people attempt suicide but others do not. Understanding of the psychological processes that underpin both suicidal ideation and the decision to act on suicidal thoughts is particularly important, because interventions should be targeted at addressing suicidal ideation when it first emerges, before it progresses to a suicide attempt.

### Psychological theories of suicidal behaviour

The origins of recent theories can be traced back to Freud, although sustained research into suicide did not begin in earnest until the 1950s, and has grown substantially in the past 25 years.<sup>7,8</sup> Contemporary models of suicide are mostly diathesis stress in origin and cognitive in focus (table).<sup>8,11,12,14,15,19</sup> Diathesis–stress models posit that the negative results of pre-existing vulnerability factors are especially pronounced when activated by stress. Schotte and Clum<sup>10</sup> and Mann and colleagues<sup>12</sup> have promoted the diathesis–stress perspectives. Recent cognitive and behavioural models have also guided treatment developments.<sup>13,17</sup> Linehan's model of emotion dysregulation, originally developed in the context of borderline personality disorder, underpins dialectical behaviour therapy,<sup>20</sup> whereas other theoretical developments have focused on an individual's appraisal system.<sup>16</sup> Psychological theories are important theoretically and clinically because they provide a framework to understand how a complex interplay of factors combine to increase risk of suicide. Additionally, these theories help to identify potentially modifiable targets for treatment.

Although earlier theories focused on individual psychological factors,<sup>11,21</sup> they did not account for why most people who have thoughts of suicide do not attempt suicide.<sup>3</sup> In view of the clinical importance of being able to make predictions about the transitions to suicidal

Author	Basic premise
Cubic model of suicide Shneidman (1985) <sup>9</sup>	The combination of press (stress), pain (psychache), and perturbation result in suicide risk
Diathesis–stress–hopelessness model of suicidal behaviour Schotte and Clum (1987) <sup>10</sup>	Cognitive vulnerability (eg, social problem solving) accounts for the association between stress and suicide risk
Suicide as escape from self Baumeister (1990) <sup>11</sup>	Main motivation of suicide is to escape from painful self-awareness
Clinical model of suicidal behaviour Mann and colleagues (1999) <sup>12</sup>	Stress–diathesis model, wherein suicide risk is caused not only by psychiatric disorder (stressor) but also by a diathesis (ie, tendency to experience more suicidal ideation or impulsivity)
Suicidal mode as cognitive behavioural model of suicidality Rudd and colleagues (2001) <sup>13</sup>	Based on the ten principles of cognitive theory, the model describes the cognitive, affective, behavioural, and physiological system characteristics associated with the development of suicide risk
Arrested flight model Williams (2001) <sup>14</sup>	Suicide risk is increased when feelings of defeat and entrapment are high and the potential for rescue (eg, social support) is low
Interpersonal psychological model Joiner (2005) <sup>15</sup>	Suicidal desire is caused by high levels of burdensomeness, and thwarted belongingness; desire is probably translated into suicidal behaviour when capability is high
Schematic appraisal model of suicide Johnson and colleagues (2008) <sup>16</sup>	An appraisal model which proposes that risk is caused by the interplay between biases in information processing, schema, and appraisal systems
Cognitive model of suicidal behaviour Wenzel and Beck (2008) <sup>17</sup>	Diathesis–stress model with three main constructs: dispositional vulnerability factors, cognitive processes associated with psychiatric disturbance, and cognitive processes associated with suicidal acts
Differential activation theory of suicidality Williams and colleagues (2008) <sup>18</sup>	Associative network model, in which the experience of suicidal ideation or behaviour during a depressive episode increases the likelihood that it will re-emerge during subsequent episodes
Integrated motivational–volitional model of suicidal behaviour O'Connor (2011) <sup>8</sup>	The model is a diathesis–stress model, which specifies the components of the premotivational, motivational (ideation and intent formation), and volitional (behavioural enactment) phases of suicidality

Table adapted from O'Connor<sup>8</sup> by permission of John Wiley & Sons.

Table: Predominant models of suicidal behaviour

ideation and from suicidal ideation to attempt or death, we focus on two theories that do so. Indeed, understanding of this distinction is of crucial importance. First, Joiner's<sup>15,22</sup> interpersonal theory of suicide (figure 1) posits that the coexistence of high levels of perceived burdensomeness (ie, feeling a burden on others) and low levels of belongingness (ie, feeling alienated or that you do not belong), and being hopeless that these states will not change, lead to the development of suicidal desire (ie, suicidal ideation). Suicidal desire is a necessary though not sufficient cause for a suicide attempt. However, if a person with high suicidal desire acquires the capability to attempt suicide, then the risk of a serious suicide attempt is increased. Acquired capability comprises reduced fear of death and increased tolerance for physical pain. According to the theory, exposure to and encounter with previous painful experiences increase an individual's tolerance for the physical-pain aspects of self-harm through habituation processes. The core components of the theory have attracted considerable research attention.

Second, the integrated motivational-volitional model of suicidal behaviour<sup>8</sup> conceptualises suicide as a behaviour (rather than a byproduct of mental disorders) that develops through motivational and volitional phases (figure 2). The motivational phase describes the factors that govern the development of suicidal ideation and intent, whereas the volitional phase outlines the factors that determine whether an individual attempts suicide. This model integrates the key factors from earlier theories into a detailed map of the suicidal process from thoughts to acts of suicide. Whereas belongingness and burdensomeness are paramount in the final common pathway to suicide in the interpersonal theory, feelings of defeat (ie, feeling defeated after triggering circumstances) and entrapment (ie, unable to escape from stressful, humiliating, or defeating circumstances) are posited to be of most importance within the integrated motivational-volitional model. When an individual feels both defeated and trapped, the likelihood that suicidal ideation will emerge increases when motivational moderators (eg, low levels of social support) are present. The integrated motivational-volitional model draws on the pioneering research done by Williams<sup>14</sup> and others into social-rank theory, the cry-of-pain and arrested-flight hypotheses, the differential-activation hypothesis, and the theory of planned behaviour.<sup>23-25</sup> Whereas the interpersonal theory of suicide posits that acquired capability establishes behavioural enactment (ie, suicide attempts), it is just one of several (volitional phase) factors within the integrated motivational-volitional model posited to increase the likelihood of a suicide attempt. Such factors include exposure to the suicidal behaviour of others, impulsivity, and having access to the means of suicide. Although the integrated motivational-volitional model is new, empirical evidence supports its usefulness.

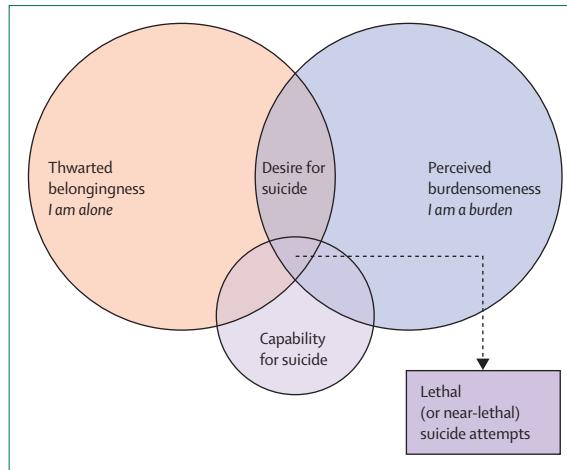


Figure 1: Interpersonal theory of suicide<sup>15,22</sup>

Figure reproduced from Van Orden and colleagues<sup>22</sup> by permission of the American Psychological Association.

## Psychological risk and protective factors

### Classification

The factors associated with suicide risk can be classified into four groups: personality and individual differences, cognitive factors, social factors, and negative life events (panel 2). In reviewing these factors, we summarise what is known to date, but do not exhaustively describe the potential mechanisms through which these factors might affect suicidal behaviour, which is an extremely important goal for future research. We selected these factors because they feature in the theoretical models, have received research attention in the literature, or are promising candidates for the future. Each of these factors might contribute to the emergence of suicide risk independently or together with other factors. Some of the factors are associated with the emergence of suicidal ideation, whereas others increase the likelihood that suicidal thoughts will be acted on.

### Personality and individual differences

Factors related to personality and individual differences are of interest because they are fairly stable in adulthood, often have known biological bases, are affected by the environment, and affect cognition and emotion.

### Hopelessness

Although hopelessness is usually operationalised as a state factor (ie, a factor that varies over time), we include it in this section to emphasise that it also has trait components (ie, components that are relatively stable over time),<sup>26</sup> and future research should investigate the relative predictive usefulness of state versus trait hopelessness. Hopelessness, defined as pessimism for the future, is a strong predictor of all indices of suicidal ideation and behaviour.<sup>27-31</sup> In a classic study, Beck and colleagues<sup>32</sup> were able to predict 91% of all suicides from

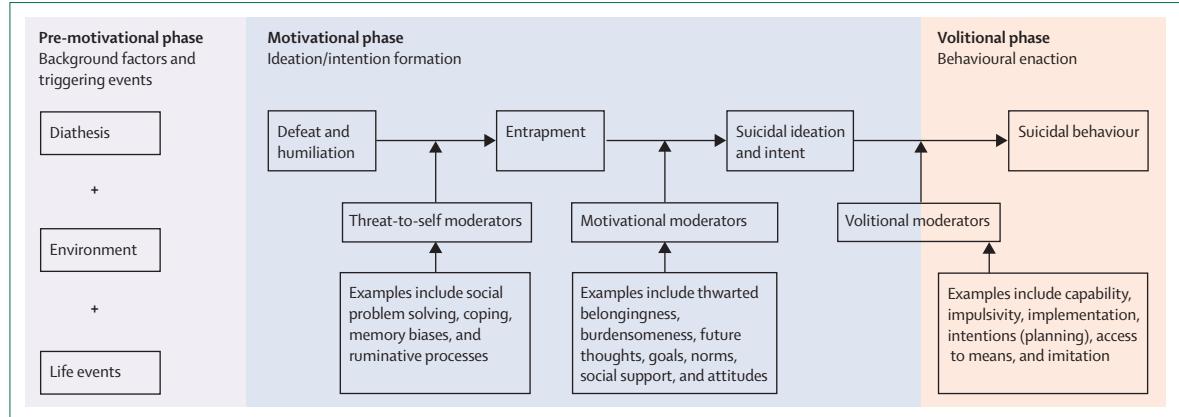


Figure 2: Integrated motivational-volitional model<sup>8</sup> of suicidal behaviour

Figure reproduced from O'Connor<sup>8</sup> by permission of John Wiley & Sons.

hopelessness scores in a 10-year prospective study of patients admitted to hospital with suicidal ideation. However, findings from a 12-year prospective Finnish study<sup>33</sup> showed that when suicidal intent was compared with hopelessness (in a sample of 224 cases of attempted suicide), hopelessness was a non-significant predictor of suicide. More recently, in a small study<sup>34</sup> of people who attempted suicide, hopelessness did not significantly predict future suicide attempts in a 4-year follow-up when past suicide-attempt history and entrapment were included in the analysis. These more recent mixed findings suggest that although hopelessness is important in the development of suicidal ideation (consistent with theoretical models), other factors might be more useful in the prediction of actual suicide attempts or deaths.

#### Impulsivity

Although impulsivity has been studied for decades, its association with suicide risk is not as consistent or as straightforward as originally thought, and its effect might be less direct.<sup>28,35</sup> Findings from many studies<sup>3,36,37</sup> have shown that self-reported impulsivity is associated with suicidal ideation, suicide attempts, and suicide deaths. The meaning of impulsivity is confused and needs resolution, with some studies operationalising it as novelty-seeking behaviour or having a short attention span, whereas other researchers define it as non-planning or cognitive impulsivity.<sup>37</sup> Other research emphasises the importance of differentiation between impulsivity as a trait versus a state construct.<sup>38</sup> The evidence is also mixed regarding whether impulsivity is associated with the medical seriousness of the episode.<sup>39,40</sup> Nonetheless, impulsivity should still be considered when risk of suicide or self-harm is assessed. It might not be important in all cases of suicide risk, but it is more likely to be evident in young people than in older people.<sup>2,41,42</sup> Impulsivity can be useful to predict repeated suicide attempts in individuals with personality disorder.<sup>43</sup> Impulsive aggression is associated with suicide

attempts.<sup>12,28</sup> Negative urgency, defined as the degree to which a person acts rashly when distressed, also needs further research.<sup>44</sup>

#### Perfectionism

Growing evidence suggests that perfectionism is associated with suicidal ideation and suicide attempts, although few prospective clinical studies have been done.<sup>45,46</sup> Perfectionism can be defined in different ways and not all types are equally associated with suicide risk. One type, socially prescribed perfectionism (defined as the belief that other people [eg, family members] hold unrealistically high expectations of you<sup>47</sup>), is most consistently associated with suicidal thoughts and attempts, especially when these socially determined beliefs are internalised as self-criticism. Recent research suggests that the social dimensions of perfectionism increase suicide risk by promoting a sense of social disconnection,<sup>48</sup> which is consistent with the integrated motivational-volitional model and interpersonal theory of suicide. In particular, perfectionistic beliefs can also interact with other factors (eg, negative life events, adversity, and cognitions) to impede recovery from a suicidal episode or increase risk of suicidal ideation and self-harm further.<sup>27,45,48</sup>

**The big five personality dimensions: neuroticism, extroversion, agreeableness, openness to experience, and conscientiousness**  
 In general terms, high levels of neuroticism and low levels of extroversion are associated with suicidal ideation, attempts, and completions.<sup>49–52</sup> However, exceptions exist; in an 18-year follow-up<sup>53</sup> of patients with depression, neuroticism did not predict future suicide risk. The combined effects of high neuroticism and low extroversion might be stronger predictors of suicide than is neuroticism alone.<sup>54</sup> The proposed interaction is consistent with predominant theories, suggesting that people who are more sensitive to distress (ie, high neuroticism) and are socially disconnected (ie, low

extroversion) are at increased risk of suicide. The findings for openness to experience, conscientiousness, and agreeableness are less consistent, and these constructs have been less frequently studied.<sup>49,55</sup>

#### Optimism and resilience

Surprisingly few attempts have been made to investigate the direct or indirect association between trait optimism and suicidal ideation or attempts, and almost no longitudinal studies have been published. Some evidence, however, in college students suggests that people with high optimism have reduced risk of suicidal ideation or attempts when confronted with severely or moderately negative life events compared with people with low optimism.<sup>56</sup> Low levels of optimism are associated with self-harm in adolescent girls.<sup>57</sup> Optimism has also been shown to buffer the association between hopelessness and suicidal ideation.<sup>58</sup> The protective effect of optimism has also been shown in a patient sample recruited from a primary care clinic.<sup>59</sup> Although these findings are promising, the protective effect over time is largely unknown and needs future scrutiny.

Despite research interest in resilience (defined as "qualities that enable one to thrive in the face of adversity"<sup>60</sup>), there is little evidence for its protective effect in the context of suicide risk. Some evidence suggests a protective effect of resilience on suicide ideation in military personnel,<sup>61</sup> misusers of alcohol and illegal drugs, and prisoners,<sup>62</sup> but its effect on suicide attempts or deaths by suicide is largely unknown. The validation of the suicide resilience inventory might stimulate more research into this topic.<sup>63</sup> In view of the scarcity of research into protective factors, efforts have been made to identify factors that confer resilience by buffering against suicide risk in the face of adversity.<sup>64</sup> Such studies have examined appraisals of stressful situations and self-appraisal, and their findings suggest that positive appraisals might buffer against the development of suicidal ideation.<sup>16,64</sup>

#### Cognitive factors

In an attempt to understand how and why some people's thought processes lead them to decide to end their lives, researchers have examined different cognitive processes that might be deficient or dysfunctional in suicidal people. Such research has identified several cognitive factors that seem to increase the risk of suicidal behaviour.

#### Cognitive rigidity

For decades, clinical and theoretical accounts have described suicidal people as being cognitively rigid or inflexible, leading to the conclusion that suicide is the only option. Findings from studies in which behavioural tests of cognitive rigidity are administered to suicide attempters and clinical controls have lent support to this notion. This rigidity was first reported in an early study by Neuringer,<sup>65</sup> and has since been shown many times with

#### Panel 2: Key psychological risk and protective factors for suicidal ideation and suicidal behaviour

##### Personality and individual differences

- Hopelessness
- Impulsivity
- Perfectionism
- Neuroticism and extroversion
- Optimism
- Resilience

##### Cognitive factors

- Cognitive rigidity
- Rumination
- Thought suppression
- Autobiographical memory biases
- Belongingness and burdensomeness
- Fearlessness about injury and death
- Pain insensitivity
- Problem solving and coping
- Agitation
- Implicit associations
- Attentional biases
- Future thinking
- Goal adjustment
- Reasons for living
- Defeat and entrapment

##### Social factors

- Social transmission
- Modelling
- Contagion
- Assortative homophily
- Exposure to deaths by suicide of others
- Social isolation

##### Negative life events

- Childhood adversities
- Traumatic life events during adulthood
- Physical illness
- Other interpersonal stressors
- Psychophysiological stress response

use of a range of neuropsychological measures of cognitive rigidity or flexibility, such as tests of set-shifting (ie, the ability to change thinking and behaviour in response to a changing environment).<sup>66</sup> Findings from recent studies<sup>66,67</sup> showed that this effect was not accounted for by the presence of depression, and that cognitive rigidity prospectively predicted suicidal thinking.<sup>67</sup> Impaired decision making is also evident in suicide attempters.<sup>68,69</sup>

#### Rumination

Rumination, which refers to repetitive focus on an individual's own symptoms of distress, has been linked with suicidal thoughts and attempts. A review<sup>70</sup> into the association between rumination and suicidal behaviour showed that findings from 10 of 11 studies examining

this association showed support for this link. A distinction has been noted between brooding rumination, in which a person dwells on his or her symptoms, and reflective pondering, in which a person contemplates the reasons for his or her symptoms and potential solutions, with brooding rumination being more strongly associated with suicidal thoughts and attempts.<sup>70-72</sup> Rumination has also been associated with increased symptoms of depression, hopelessness, and impaired problem solving; an important aim for future research is to clarify how these factors might work together to increase the risk of suicidal behaviour.

#### *Thought suppression*

Thought suppression refers to attempts to intentionally stop thinking unwanted thoughts. During the past 25 years, Wegner and other researchers<sup>73,74</sup> have reported that thought suppression paradoxically increases the frequency of specific unwanted thoughts, and might be a mechanism through which several forms of psychopathology develop. Findings from several studies<sup>75,76</sup> showed that a tendency to suppress unwanted thoughts was associated with both suicidal ideation and attempts, and that thought suppression mediated the association between emotion reactivity and the occurrence of self-injurious thoughts and behaviour.<sup>75</sup>

#### *Autobiographical memory biases*

People who engage in suicidal behaviour have a decreased ability to recall specific autobiographical memories,<sup>77</sup> which might in turn impair their ability to imagine the future and to engage in effective problem solving, thus increasing the likelihood of suicidal behaviour.<sup>78,79</sup> Some evidence suggests that autobiographical memory biases result in part from previous abuse or from the presence of an affective disorder,<sup>80</sup> and as such represent a potential mechanism through which abuse and affective disorders could lead to suicidal behaviour.

#### *Belongingness and burdensomeness*

Durkheim,<sup>81</sup> Shneidman,<sup>21</sup> and most recently Joiner<sup>15</sup> have proposed that thwarted belongingness predisposes to the development of suicidal thoughts and behaviour. Consistent with these theories, lack of social connectedness and subjective perception of thwarted belongingness have been associated with suicide ideation<sup>82,83</sup> and suicide attempts.<sup>84-86</sup>

A person's perceptions that he or she is a burden to others is an independent predictor of suicide ideation in a range of samples, including older adults<sup>87</sup> and people with chronic pain.<sup>88</sup> Perceived burdensomeness also has been shown to mediate the association between perfectionism and suicide ideation,<sup>89</sup> and to remain predictive of ideation even after controlling for factors such as depression and hopelessness.<sup>87</sup> Consistent with the interpersonal theory of suicide, the interaction of

perceived thwarted belongingness and burdensomeness is predictive of suicide ideation, even after controlling for depressive symptoms.<sup>90</sup>

#### *Fearlessness and pain insensitivity*

As suicidal behaviour often includes infliction of physical pain on the body, the association between suicide risk and both pain sensitivity or tolerance and fearlessness about death has been examined. Although almost all research into pain sensitivity has focused on non-suicidal self-injury, increased pain thresholds and tolerance have been reported in suicidal adolescents.<sup>91</sup> More research is needed to establish whether changes in pain sensitivity are a cause or result of suicide ideation or behaviour; how these changes vary as a function of suicidal history and across the lifespan requires clarification. Research findings suggest that suicide attempters have higher fearlessness about injury and death than do non-suicidal controls, and that this difference might account for why men are more likely to die by suicide than are women.<sup>92,93</sup>

#### *Problem solving and coping*

That people who attempt to kill themselves have difficulties with problem solving or coping is, perhaps, self-evident. Nevertheless, study findings have consistently shown a link between suicidal behaviour and deficits in both interpersonal problem solving and coping.<sup>94,95</sup> In view of the cross-sectional nature of most studies into this topic, however, the direction of this association is not clear. Moreover, these associations seem to be mostly accounted for by the presence of depression.<sup>96</sup>

#### *Agitation*

Agitation, which is often conceptualised as a state of anxious excitement or disinhibition, has been linked with suicidal behaviour in many studies.<sup>97</sup> For instance, in a chart study<sup>98</sup> of 76 patients who died by suicide during hospital admission, 79% had severe anxiety or agitation shortly before their death.<sup>98</sup> Agitation has been hypothesised to be one potential mechanism through which bipolar disorder, medical illness, and the prescription of certain psychiatric medications might increase the risk of suicidal behaviour.<sup>99-101</sup> Recent research suggests that agitation is especially predictive of suicide attempts among people who have high capability for suicide.<sup>102</sup>

#### *Implicit associations*

People with a recent history of suicidal behaviour show an implicit mental association between death and the self.<sup>103</sup> Findings from research<sup>103,104</sup> using the implicit association test showed that this association distinguished suicide attempters from distressed non-attempters presenting for emergency psychiatric treatment (ie, suicide attempters responded more quickly [measured in milliseconds] when pairing stimuli related to death and self than they did

when pairing life and self), and perhaps more importantly, that this mental association with death predicted future suicide attempts better than did prediction of future suicide attempts by either clinicians or patients.

#### Attentional biases

People with a recent history of suicidal behaviour show greater attention to, or interference for, stimuli related to suicide (eg, suicide attempters take longer to name the colour of words related to suicide than they do for neutral or negative words),<sup>105–107</sup> and this bias predicts future suicide attempts above and beyond other factors, including the presence of a mood disorder and prediction of future suicidal behaviour by either clinicians or patients.<sup>106</sup> However, whether attentional bias and implicit associations result from or are causes of suicidal thoughts remains unclear.

#### Future thinking and goal adjustment

Since the 1990s, pessimism for the future (characterised by the absence of positive future thinking, rather than the presence of negative future thinking) has been associated with suicidal ideation and attempts.<sup>108</sup> This effect of impaired positive future thinking is independent of depression.<sup>108–110</sup> Future research should explore whether the association between positive future thinking and suicide attempts changes over time, and establish whether the content of positive future thinking affects the extent to which positive thoughts are protective. More detailed study of imagery<sup>111</sup> and flashforwards (ie, images about acting out future suicide plans or being dead)<sup>112</sup> also offer promise.

Personal goal pursuit defines identity, and how people adjust when a goal becomes unattainable is known to affect wellbeing.<sup>113</sup> Indeed, evidence suggests that suicide attempters who tend not to re-engage with new goals (in the face of existing unattainable goals) are at increased risk of readmission to hospital after self-harm, with this association being further affected by the extent of existing goal disengagement.<sup>114</sup>

#### Reasons for living

Reasons for living have been studied extensively in the prediction of suicidal ideation and attempts, and have been incorporated into treatment protocols.<sup>7,115,116</sup> Good evidence suggests that individuals with few reasons for living are at increased risk of suicidal thinking<sup>117</sup> and attempts.<sup>118</sup> Related to reasons for living, in a 10-year follow-up study,<sup>119</sup> psychiatric outpatients who had a moderate-to-strong desire to die and little desire to live were at increased risk of suicide.

#### Defeat and entrapment

Defeat and entrapment have received substantial attention within social-rank theories of depression, scientific literature about arrested flight, and most recently in the integrated motivational-volitional model.<sup>14,24,120</sup> The inability to escape from defeating or

stressful circumstances provides the setting conditions for the emergence of suicidal thoughts.<sup>8,14</sup> Although defeat and entrapment are well established constructs within the psychopathology literature, their application within suicide research offers substantial promise. Indeed, both defeat and entrapment distinguish suicidal individuals from controls independently of depression and hopelessness, and both predict suicidal ideation and attempts over time.<sup>25,34,120,121</sup> Entrapment has also been shown to predict repeated suicide attempts in a 4-year period beyond traditional risk markers for suicide.<sup>34</sup>

#### Social factors

Suicide does not occur in a social vacuum. Family history of suicide increases risk of suicide; this effect is independent of familial history of mental disorder,<sup>122</sup> and is thereby partly suggestive of a social transmission effect. Exposure to suicidal behaviour of family or friends is also associated with these behaviours in adolescents.<sup>123–125</sup> Maternal suicidal behaviour could be more strongly associated with offspring suicidal behaviour than is paternal suicidal behaviour, and children are more likely to be affected by parental suicidal behaviour than are adolescents or adults.<sup>126</sup> The effects of suicide bereavement on subsequent suicide risk are discussed in detail by Pitman and colleagues.<sup>127</sup> Although psychological mechanisms (eg, modelling effects) need further empirical enquiry, depictions of suicide in the media can affect rates of suicide.<sup>128</sup> The effect of the internet on suicidal behaviour needs further attention, because it might exert both negative (eg, discouraging help seeking) and positive (eg, source of support or signposting) effects.<sup>129</sup> Indeed, study findings showed that almost 20% of adolescents reported that the internet or social networking sites influenced their decision to self-harm.<sup>130</sup> Psychological processes (including contagion, imitation, suggestion, identification, social learning, and assortative homophily or susceptibility) are also implicated in the development of suicide clusters.<sup>131</sup> Social isolation and the absence of social support are established correlates of suicide risk, and are important components of contemporary models of suicidal behaviour.<sup>25,132,133</sup> Any assessment of suicide risk should, as a matter of course, assess the extent to which a vulnerable individual is socially isolated.

#### Negative life events

##### Childhood adversities

Many studies<sup>134,135</sup> have documented a strong association between the occurrence of adverse life events during childhood (eg, physical, sexual, and emotional abuse; family violence; and parental illness, divorce, or death) and the subsequent experience of suicidal behaviour. These study findings showed a strong dose-response association between number of types of adversities and subsequent risk of suicide attempt.<sup>134,135</sup> Sexual and physical abuse during childhood are especially strong risk

For the *Series* paper by Pitman and colleagues see page 86

**Panel 3: Key directions for future psychological research****Understanding and prediction**

- Reach a consensus about terminology and phenomenology in respect of all self-injurious behaviours
- More large-scale studies that test psychological models and risk factors to predict suicide attempt and death
- Incorporation of psychological factors into national linkage databases and psychological autopsy studies
- Improved understanding of factors that distinguish those who attempt suicide from those who think seriously about it and those who repeatedly attempt suicide
- Integration of experimental, naturalistic, clinical, and non-clinical research findings
- Comprehensive testing of psychological models of suicidal behaviour
- Focus on psychological factors that protect against suicide
- Better understanding of the psychology of method selection
- More psychological science research in participants from across the lifespan, from different ethnic backgrounds and countries

**Intervention and prevention**

- More large and sufficiently powered clinical trials of psychological treatments to reduce suicidal ideation, attempts, and suicide
- Development of more innovative brief psychosocial interventions (employing a range of delivery modalities) to reduce suicidal ideation, attempts, and suicide
- Better understanding of how different types of media representation of suicide and self-harm increase risk of suicidal behaviour and suicide clusters
- Improved understanding of the barriers to help-seeking
- Integrating advances in psychological science into suicide prevention and intervention programmes
- Development of public health interventions to promote resilience
- Development of interventions which can be delivered in low-income and middle-income countries

factors for both the onset and persistence of suicidal behaviour, and the risk of suicidal behaviour is particularly high during childhood and adolescence, with the association between childhood adversities and suicidal behaviour decreasing with age.<sup>135</sup>

**Traumatic life events during adulthood**

Unfortunately, negative life events can affect wellbeing at any age, and traumatic events during adulthood (eg, physical or sexual abuse; death of a loved one; disasters or accidents; and exposure to war or other violence) can also increase the risk of subsequent suicidal behaviour.<sup>136,137</sup> Study findings have shown a dose-response relationship between the number of types of adversities and risk of subsequent suicidal behaviour; again, physical and sexual abuse seem to convey the highest risk for both the onset and persistence of suicidal behaviour.<sup>136</sup>

**Physical illness**

Physical illnesses have also been linked with suicidal behaviour. The presence and accumulation of physical illnesses (eg, heart disease, chronic pain, and respiratory disorders) are significantly associated with subsequent suicidal behaviour.<sup>138-140</sup> The mechanism through which physical illness increases risk of suicidal behaviour is not

completely understood. Some study findings suggest that this association is attributable to the presence of depression,<sup>139</sup> whereas other investigators have reported that this association remains even after controlling for mental disorders.<sup>138</sup>

**Other interpersonal stressors**

Various types of interpersonal stressors can increase the risk of suicidal behaviour,<sup>141</sup> even after controlling for effects of mental disorders.<sup>142</sup> Interpersonal stressors can take various forms, and several different types of stressors have been linked with suicidal behaviour, including romantic problems, legal difficulties, loss of income,<sup>143</sup> non-heterosexual orientation,<sup>144,145</sup> and bullying and victimisation.<sup>146</sup>

Although the link between important negative life events and increased risk of suicidal behaviour is clear, the mechanism is not fully understood. Some investigators report that the association between negative life events and suicidal behaviour is mediated by the presence of mental disorders,<sup>145,146</sup> whereas other study findings do not support this explanation.<sup>142</sup> A psychophysiological mechanism probably underpins the association. Indeed, dysregulation of the hypothalamic-pituitary-adrenal axis is implicated in the suicidal process.<sup>147</sup> However, the exact nature of the association is unclear, because evidence suggests that suicide risk is associated with abnormal concentrations of cortisol or a maladaptive cortisol response to stress. Moreover, most people experience negative life events of some kind at some point in their lives but do not engage in suicidal behaviour, emphasising the importance of considering how vulnerability factors and stress factors might interact to produce suicidal behaviour, as suggested by theoretical models.

**Psychological treatment**

Most people struggling with suicidal thoughts and behaviours (roughly 60%) do not receive treatment.<sup>148</sup> The main reasons for not seeking help are low perceived need and the desire to handle the problem personally.<sup>148</sup> Future research is needed to develop effective ways to connect people with suicidal thoughts and behaviours with effective treatments. Unfortunately, few well-established evidence-based treatments for suicidal behaviour are available, such as prevention programmes,<sup>149</sup> pharmacological interventions,<sup>150</sup> and psychological treatments.<sup>151</sup> Treatments targeting depression have not been shown to reduce suicidal thoughts or behaviours.<sup>152</sup> Some evidence suggests that specific forms of cognitive and behavioural therapy that target suicidal thoughts and behaviours directly can decrease the risk of suicide reattempt among people who have made a previous attempt. For example, clinical trials testing dialectical behaviour therapy (in patients with borderline personality disorder)<sup>153</sup> and cognitive therapy (in recent suicide attempters)<sup>154</sup> have lent support to the effectiveness of these treatments to reduce the rate of suicide reattempt compared with other

interventions. However, few replications have been done by independent research groups, and studies have yet to establish interventions that prevent people at risk from making an initial suicide attempt. Findings from a meta-analysis<sup>155</sup> of cognitive behaviour therapies for suicidal behaviour showed a statistically significant effect of cognitive behavioural therapy to reduce the rate of suicide attempt; however, the investigators noted a publication bias in this topic, with a funnel plot of published studies centring close to zero, smaller studies reporting more positive effect sizes, and no published study findings showing negative effects for any intervention.

Several new interventions also offer promise. The collaborative assessment and management of suicidality is a clinical intervention designed to enhance the therapeutic alliance and decrease the risk of suicidal behaviour.<sup>156</sup> Safety-planning interventions, which include the identification of warning signs, coping strategies, and sources of support in addition to restriction of access to lethal means, are also receiving welcome attention.<sup>157</sup> Treatment based on mentalisation has shown some promise to reduce self-harm in adolescents.<sup>158</sup> The fact that most suicidal people do not receive treatment, and that little evidence is available for the effectiveness of the interventions received by those who do, emphasises the tremendous importance of future work to develop psychological treatments for people at risk of suicidal behaviour. The utility of the internet and smartphones in treatment delivery also requires close examination.

### Key directions for psychological research

Despite substantial advances in understanding of the suicidal mind, much more psychological research is needed (panel 3). Studies of suicide should routinely incorporate psychological components, especially in the case of large-scale national-linkage studies of suicide and suicide attempts. Psychological autopsy studies, in which information is collected about the deceased person from several informants, have played a key part in understanding the risk factors for suicide.<sup>159</sup> More sophisticated autopsy studies in the future should be set up to investigate psychological factors in more detail. Research efforts to distinguish between suicide ideators, suicide attempters, and repeated attempters should be prioritised, because understanding of the factors that enable or impede behavioural enactment will inform the development of intervention studies. Studies that use new technologies (eg, smartphones) and real-time data collection (eg, ecological momentary assessment) are essential in this regard. Focus on the differential effects of psychological factors of suicide risk as a function of age, culture, and ethnic origin should be increased. There is still a tendency to generalise findings from, for example, middle adulthood to older adult and adolescent populations. Researchers have also over-relied on self-report observational studies; multimethod

### Search strategy and selection criteria

We searched PsycINFO, PubMed, and Web of Knowledge for articles published between January, 2003, and January, 2014, with the terms "suicid\*", and "psycholog\*" or "personality" or "cognitive". We used no language restrictions. We selected key papers from the identified publications on the basis of topic covered and quality of research. Within a topic area with many studies, we selected a study (or studies) suggestive of the evidence-base or included a study that described a key or new finding. In less well researched but new topics, key studies were selected. We supplemented these publications with earlier landmark papers and suggestions from reviewers. The studies covered a wide range of populations, many of which included participants with psychiatric disorders.

approaches with an increased focus on basic-science experimental research will help uncover the mechanisms by which factors increase or reduce suicide risk. As the specialty develops, the testing of psychological theories of suicide risk should be the rule rather than the exception. Such programmatic testing of risk and protective factors will not only benefit researchers, but also assist clinicians in the translation of research into clinical practice.

Although the physical availability (ie, access) to methods of suicide affects their use,<sup>160</sup> not much is known about the psychological factors that affect selection of one method of suicide over another. Psychological suicidology is still dominated by research in populations in western Europe and the USA and Canada, despite the fact that 60% of the world's suicides occur in Asia. The dearth of research into protective factors also needs to be addressed. Although the development and use of psychological treatments has grown somewhat,<sup>161</sup> they are not well supported by evidence and most people who experience suicidal thoughts and behaviours do not seek them out. The barriers to help-seeking and the role of media (including social media) within the suicidal process also remain poorly understood; although media guidelines for the reporting of suicide exist, more empirical evidence about which aspects of reporting are most dangerous is needed. Finally, psychological science has much to offer to policy planners in the development and implementation of programmes for suicide prevention. Promising multicomponent intervention developments have been made in recent years,<sup>162</sup> and further advancement is needed to combat this devastating public health problem.

#### Contributors

Both authors contributed equally to the preparation of this Series paper.

#### Declaration of interests

We declare that we have no competing interests.

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