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Do the Constructs of the Interpersonal Psychological Theory of Suicide Mediate the Relationship between Depression and Suicidal Behaviour?

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Do the Constructs of the Interpersonal Psychological Theory of Suicide Mediate the Relationship between Depression and Suicidal Behaviour?

By

Kathy Cook

September 2020

A thesis submitted in partial fulfilment of the University's requirements for the Degree of Doctor of Philosophy

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Applicant:

Kathy Cook

Project Title:

Exploring risk and protective factors relating to thoughts and attempts to end own life in adults with and without Autism Spectrum Conditions (ASC)

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

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14 November 2016

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For all those whose lives have been touched by suicide.

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ABSTRACT

Aim

This research aims to investigate the effectiveness of the Interpersonal-Psychological Theory of Suicide (IPTS) as a model for understanding and predicting the risk of three levels of suicidal behaviour: passive suicidal ideations (those experiencing no suicidal thoughts, occasional thoughts about suicide and passive suicidal plans), active suicidal thoughts (those experiencing occasional thoughts about suicide, passive suicidal plans and active suicidal plans), and potentially lethal suicide attempts (those experiencing passive suicidal plans, active suicidal plans and suicide attempts). The research questions were: 1) Do the IPTS constructs of Thwarted Belongingness (TB), Perceived Burdensomeness (PB) and Hopelessness (H) represent general predictors of mental health distress or are they specific predictors of suicidal risk?; 2) Do the IPTS constructs (TB, PB and H) remain important predictors of risk when compared with the more traditional, well established epidemiological (age, sex and relationship status) and psychopathological (depression and anxiety) risk factors already known to influence suicidal behaviour?; 3) Do the IPTS constructs (TB and PB) function as proximal risk factors (mediators) between depression and suicidal behaviour, (controlling for age, sex and relationship status)?; 4) Are the IPTS constructs (TB and PB) related to each other?; 5) Does hopelessness mediate the relationship between TB and PB?, and 6) Does the IPTS construct of AC help predict suicide attempts?

Methods

The study used a cross-sectional design to survey 254 participants from the general population, and deliberately targeted groups known to be at risk of suicide including people with mental health and developmental difficulties. Measures used included: The Suicide Behaviors Questionnaire-Revised (SBQ-R); The Interpersonal Needs Questionnaire (INQ-10); The Acquired Capability for Suicide Scale (ACSS-20), and The Hospital Anxiety and Depression Scale (HADS).

Results

Using linear and hierarchical regression, and sequential mediational analysis via the PROCESS macro, the results showed that: 1) TB and PB represented a model specific to suicidal risk rather than general mental health distress; 2) the IPTS constructs accounted for more variance in suicidal risk than socio-demographic factors (age, sex and relationship status) or mental health difficulties (depression and anxiety); 3) TB and PB were proximal factors in the relationship between depression and each of the three levels of suicidal behaviour; 4) TB and PB were related to each other and results established a statistical time ordering such that depression led to TB which caused PB which in turn led to the two more serious forms of suicidal behaviour; 5) hopelessness mediated the relationship between TB and PB and became an increasingly pervasive state of mind as the severity of suicidal behaviours increased; 6) eight items of the Acquired Capability for Suicide Scale (ACSS-20) were associated with suicidal risk, with: (i) a readiness to die ("I could kill myself if I wanted to") being specifically associated with the transition from passive suicidal ideation to active suicidal thoughts and (ii) a readiness to die combined with a reduced fear of death ("I am not afraid to die") significantly heightening the risk of experiencing potentially lethal suicide attempts.

Conclusion

Following an examination of the specificity of the IPTS framework, the results seem to suggest that its main components (TB, PB, Hopelessness and AC) could have a great deal of clinical utility in terms of: improving risk assessment, enhancing public and professional education about the causal nature of suicidal, and as the basis of a psychotherapeutic model to help improve the interpersonal wellbeing of people experiencing various forms of suicidal behaviour.

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LIST OF ABBREVIATIONS

AC	Acquired Capability
ACSS	Acquired Capability for Suicide Scale
BDI	Beck Depression Inventory
FAD	Fearlessness about Death
H	Hopelessness
HDSQ-SI	Hopelessness Depression Symptom Questionnaire
INQ	Interpersonal Needs Questionnaire
IPTS	Interpersonal-Psychological Theory of Suicide
PB	Perceived Burdensomeness
SB	Suicidal Behaviours
SBQ-R	Suicidal Behaviors Questionnaire-Revised
SI	Suicidal Ideations
TB	Thwarted Belongingness

INTRODUCTION

Thesis Aims

The aim of this thesis is to examine whether the Interpersonal Psychological Theory of Suicide (IPTS) provides an effective model of suicide risk prediction. More specifically, the study employs a cross-sectional research design to evaluate whether the constructs of the IPTS (thwarted belongingness; TB, perceived burdensomeness; PB, hopelessness and acquired capability; AC) mediate the relationship between depression and suicidal behaviour. This will be achieved through examining six research questions:

1) Do the IPTS constructs (TB, PB and hopelessness) represent general predictors of mental health distress or are they specific predictors of suicidal risk?

2) Do the IPTS constructs (TB, PB and hopelessness) remain important predictors of risk when compared with the more traditional, well established epidemiological (age, sex and relationship status) and psychopathological (depression and anxiety) risk factors already known to influence suicidal behaviour?

3) Do the IPTS constructs (TB and PB) function as proximal risk factors (mediators) between depression and suicidal behaviour?

4) Are the IPTS constructs (TB and PB) related to each other?

5) Does hopelessness mediate the relationship between TB and PB?

6) Does the IPTS construct of AC help predict suicide attempts?

Why Predict Suicide?

Accurate information on global rates of suicide and suicidal attempts are difficult to obtain, largely because there is no consensus on how suicide should be defined and

there are cultural and legal differences in how acts of death might be interpreted or reported (Im et al., 2016). However, the World Health Organization (WHO, 2018) estimates that 800,000 individuals die by suicide annually and that more people die by suicide each year than do through the totality of all wars and natural disasters (WHO, 2014). Suicide is the second leading cause of death worldwide in those aged 15-29 years old (WHO, 2018).

In the UK, 5,961 people died by suicide in 2019 which represents a rate of 11.0 deaths per 100,000 of the population (Office for National Statistics, 2020). In 2018, more people died by suicide than as a result of drug misuse (which represented a rate of 5.09 per 100,000) and suicide was the leading cause of death for people aged 20 – 34 years old (Office for National Statistics, 2019). Suicidal ideation is found to occur more frequently than suicidal behaviours with lifetime rates in the UK general population reported as 9.2% for suicidal thoughts and 3.1% for suicidal plans (Nock et al., 2008).

As a consequence of non-fatal suicidal attempts, individuals are often left with serious, and sometimes irreversible, medical injuries (Wirbel et al., 1998) or significant psychological consequences (including shame, low self-worth and hopelessness) all of which are well-established indicators of future suicide risk (O'Connor, et al., 2014). Furthermore, the death of a loved one by suicide has a devastating impact on those around them. For family members, grief impacts greatly on established family bonds and can result in feelings of rejection (Dyregrov & Dyregrov, 2005; Jordan, 2001). Friends may feel responsible for either contributing to, or not preventing a death by suicide leading to feelings of guilt or blame of others (Parrish et al., 2005). The impact on the wider community can include an increased propensity for further suicidal behaviour, often referred to as ‘copy-cat’ suicides (Jones et al., 2013).

Despite these problems, our current ability to predict the risk of suicide has been described as ‘only slightly better than chance’ (Franklin et al., 2016) with suicide death rates remaining relatively static over time (May & Klonsky, 2016). As such, existing suicide assessment measures appear to have limited validity or clinical utility (Runeson et al., 2017). Clearly, more work is required on risk prediction in order to reduce the

resulting number of deaths, injuries and wider levels of psychological distress caused as a consequence.

What is Suicidal Behaviour?

The term 'suicide' is generally understood as an action directed towards ending one's own life. More formally, 'suicide' may be defined as: "Death from injury, poisoning, or suffocation where there is evidence (either explicit or implicit) that the injury was self-inflicted, and the decedent intended to kill himself/herself." (O'Carroll et al., 1996 pp. 246, 247). However, the problem with such definitions is that they fail to address the complexities associated with trying to establish the meaning and in turn measurement of suicide.

Firstly, instead of being understood as a single action resulting in death, the term 'suicide' could also be more broadly conceptualised as representing a series of behaviours, including: "suicidal thoughts, intentions, ideations, gestures, attempts, completions, (and) equivalents (Silverman et al., 2007). In fact, a great deal of traditional research within suicidology has failed to appreciate the complexities associated with these behaviour differences, typically by only measuring suicide completions as if it were a descrete event (May & Klonsky, 2016).

Secondly, there is a question as to whether suicidal behaviours should be understood as a 'continuous' process of deterioration or as a pattern of behaviours along a 'spectrum' of suicidality. The former describes a downward spiral of decline ranging from mild suicide-related behaviours (such as infrequent ideation) to extreme suicide-related behaviours (including chronic ideation and intent to die) (Rudd & Joiner, 1998). This approach is implicit in studies which measure one aspect of suicidal behaviour, typically, suicidal ideations, and generalise findings to all forms of suicidal activity (see for example, Pereira et al., 2010; Troister & Holden, 2010). The latter notion of a 'spectrum' accepts the possibility of a continuous pattern but also allows for discrete suicidal activity such as experiencing ideations only.

A final definitional difficulty requires us to recognise that suicide is rarely a one-off experience, but needs to be understood in terms of: (i) evidence of prior suicidal history (Borges et al., 2006); (ii) evidence of frequency of suicidality (Miranda et al., 2008), and (iii) whether thoughts are communicated to others or secretive (Rudd et al., 2006). In an attempt to address these complexities, the definition of *suicidality* used by this study is consistent with that proposed by Silverman et al., (2007) which interprets suicidal activity in terms of a spectrum of behaviours including suicidal thoughts, plans, communications, desires and acts. This spectrum approach is also in line with the terminology employed by the IPTS which characterises suicidal behaviour as including thoughts, communications and behaviours (Van Orden et al., 2010). As such the nomenclature used throughout this thesis will include: (i) *suicidal behaviours*, which relates to all forms of suicidality including suicidal thoughts and attempts*; (ii) passive suicidal ideations* which refers to generally mild, passing thoughts of suicide*; (iii) active suicidal thoughts* which includes more active thoughts of suicide which may be accompanied by a plan, and *(iv) potentially lethal suicide attempts.*

Why Study Interpersonal Processes?

Traditional theories of suicide propose frameworks which identify large numbers of people who may be at an increased risk of suicide often based on epidemiological or mental health factors (for instance males, or those experiencing depression). However these approaches lack the ability to identify those at the most acute risk of suicide (Franklin et al., 2016). In order to establish whether the IPTS is robust enough to be considered as an effective predictive model of suicidal behaviour, it needs to be tested in terms of its specificity. In this case, specificity relates to the theory's ability to predict more exactly who is at the most risk of suicidal behaviour based on the influence of particular interpersonal conditions.

Interpersonal relationships are bonds or associations between two or more people, where "behaviours, emotions and thoughts are…interconnected' (Clark & Reis, 1988 pp 611). They may be based on love, friendship, familial bond or acquantaince. They have been widely associated with suicidal behaviours. For example Durkheim, (1897) showed that deeply individualised decisions about ending one's own life were

intricately linked to social forces suggesting that the extent to which individuals perceived themselves as belonging to something greater than themselves (e.g. wider society) represented a predictor of suicide. In Baumeister's (1990) 'escape' theory of suicide, failed interpersonal relationships were defined as social 'stressors' that triggered a psychological sense of 'self-awareness' which was considered so painful that suicide was rationalised as a reasonable means of escape.

More recent theories have continued to account for the role of interpersonal processes in suicidal thoughts and behaviours. These theories are organised under the 'ideation-to-action' framework (term proposed in personal communication by N. Neufeld; Klonsky & May, 2014), which recognises suicidality as a spectrum of behaviours and tries to account for why only a minority who think about suicide actually attempt to end their own lives.

For example, the Three-Step Theory of suicide (3ST: Klonsky & May, 2015) describes how interpersonal difficulties such as loneliness or connectedness contribute to the emergence and escalation of suicidal thoughts. The theory adopts the notion of 'capability' (from Joiner, 2005 discussed later) to explain how some people who think about suicide develop the psychological tools necessary in order to make a genuine attempt to end their own lives.

The Integrated Motivational-Volitional Model of suicide (IMV; O'Connor, 2011) describes three phases of suicidal behaviour; (i) the pre-motivational phase (which consists of background factors and triggering events); (ii) the motivational phase (which describes suicidal ideation and intent), and (iii) the volitional phase (which concerns suicidal behaviours). The model draws heavily on interpersonal processes such as social support, belongingness and capability to describe a series of moderators which it says influences behaviour across each stage of suicidality.

Both of these theories originate from principles underlying the IPTS (Joiner, 2005; Van Orden et al., 2010). This model is organised around three interpersonal constructs. TB describes how a decline in the frequency and/or quality of interactions in society can

cause people to feel as though they don't belong. PB describes how people develop a sense of being a burden to others, often as a result of social or psychological difficulties such as: poor physical or mental health, being elderly, divorced or unemployed. While both of these constructs help predict suicidal thoughts, the third component, AC describes the psychological mechanisms necessary in order to make a genuine suicide attempt, namely: becoming fearless about death and developing a high tolerance for pain (Van Orden et al., 2010).

Another construct often associated with this model is that of 'hopelessness' which may be defined as not feeling optimistic about the future (Beck et al., 1975). The role of this construct is not well developed within current theoretical models of suicidal behaviour , but it is generally understood as a state of mind which has a close causal relationship with the other three constructs and which is believed to become progressively worse over time (Van Orden et al., 2010).

Why Study the Interpersonal Psychological Theory of Suicide?

As previously discussed, traditional theories of suicide propose frameworks which identify large numbers of people who may be at an increased risk of suicide (for instance males, or those experiencing depression). However these approaches lack the ability to identify those at the most acute risk of suicide (Franklin *et al.*, 2016). More recent models of suicidal behaviour which draw on the principles of an 'ideation-to-action' framework (Klonsky & May 2014) are characterised by large numbers of variables (see for instance the IMV; O'Connor, 2011) or constructs which are difficult to reliably define and measure such as pain (see for instance the 3ST; Klonsky & May 2015).

There are therefore four key benefits to using the IPTS as a model of suicide risk prediction. Firstly, the theoretical foundations of the IPTS model are supported by an established evidence base reporting an association between suicide and factors such social isolation and psychiatric history (Dervic, Brent & Oquendo, 2008; Van Orden et al., 2010). Its authors argue that this enables the IPTS to account for existing models of suicide based on mental health or demographic status (Van Orden et al., 2010).

Secondly, as the IPTS was the first model to differentiate between suicidal thoughts and behaviours, it provides a framework for subsequent similar models such as the 3ST (Klonsky & May, 2015) and the IMV (O'Connor, 2011). Thirdly, the IPTS relies on three interpersonal states to explain the development of suicidal behaviours. This provides a simple, parsimonious framework for testing and understanding the importance of each construct in specifying those who may be at an increased risk of suicide. Fourthly, the IPTS builds on previous models of suicidality based on mental health and epidemiological factors to include a prominent role for interpersonal constructs. This provides a clincially meaningful undertstanding of suicidal behaviour as such factors are more amenable to therapeutic intervention than static factors such as age or sex.

While the IPTS has started to be empirically tested over the last decade, most previous studies have tended to take a broader and more piecemeal approach. This has meant: (i) studying only one or two of the constructs at a time (Hill & Pettit, 2014; Chu, Buchman-Schmitt, Moberg et al., 2016; Chu, Hom, et al., 2016) rather than adopting a more complete evaluation of all three of the theory's components; (ii) measuring the model's impact on suicidal risk in general (Cramer et al., 2013; Tucker & Wingate, 2014) rather than focusing on the broader spectrum of suicidal behaviours (thoughts, plans and attempts); (iii) interpreting suicide risk by employing a narrow operational definition in terms of recent suicidal ideations (Forrest & Smith, 2017; Testa et al., 2017) rather than using measures that more accurately reflect the complexities associated with the history and frequency of suicidal behaviour; (iv) only occasionally or indirectly evaluating the mediating role of traditional risk factors such as depression and anxiety across the theory's key constructs (Anestis & Joiner, 2011; Bauer et al., 2018) with limited consideration to the role of hopelessness, and (v) often focusing only on clinical populations (Kyron et al., 2018; Roush et al., 2017) rather than the spectrum of suicidal behaviour present within non-clinical community settings.

The current research will attempt to overcome many of the specific limitations associated with these previous studies within a single research design. It is hoped that

adopting a more in-depth focus on the specificity of the IPTS constructs will help advance our understanding of suicidal risk prediction.

How this Thesis will be Organised

This thesis is organised around 5 chapters. Following this introduction, the first two chapters present a comprehensive critical evaluation of the theoretical and empirical literature surrounding the IPTS. Chapter 1 critically examines the theoretical basis supporting the IPTS model. Chapter 2 systematically and critically reviews previous empirical research that has tested the theory's principal constructs.

Chapter 3 discusses a wide range of methodological aspects associated with the development and execution of this study, including information on: the research and sampling design; methods and measures used in data collection; the operationalisation of key variables, and the processed employed in the analysis and interpretation of the findings. The results are presented in Chapter 4 which contains 6 subsections – one relating to each principal research question. Chapter 5 provides a broader discussion of the findings and their implications in relation to clinical risk assessment, public and professional education and therapeutic treatments for suicidal behaviour.

The thesis concludes with an overview of the study's strengths and limitations and ends with suggestions for the direction of future research.

CHAPTER 1

THE INTERPERSONAL-PSYCHOLOGICAL THEORY OF SUICIDE: A LITERATURE REVIEW

The Interpersonal-Psychological Theory of Suicide (hereafter IPTS), originally developed by Joiner (2005), attempts to make sense of and improve upon our current fragmented state of knowledge about suicidal risk prediction, by presenting a more dynamic and theoretically driven approach. This approach suggests that the risk of someone developing suicidal thoughts is predicated on the emergence of two key constructs, namely: thwarted belongingness and perceived burdensomeness. The theory further states that it is important to differentiate suicidal thoughts from actual suicidal attempts, which in turn are influenced by a third construct, namely: acquired capability.

The principal aim of this chapter is to discuss the emergence of the IPTS. It will be organised around four sections. Sections 1 to 3, respectively, present the theoretical origins of the three key interpersonal constructs (Thwarted Belongingness, Perceived Burdensomeness and Acquired Capability) and their unique contribution to suicide risk prediction. Section 4 critically evaluates the assertion that these constructs represent a coherent theoretical model of suicidal risk by discussing some of the challenges that the IPTS still needs to address.

THWARTED BELONGINGNESS

Thwarted belongingness (TB) is a personal state of mind which is dominated by the belief that someone does not belong; that their connections with others at an individual, group and community level, are broken (Joiner 2005). The development of thwarted belongingness is therefore based on and influenced by, an individual's experiences of social relations with others. The inter-relationship between this construct and patterns

of suicidality can be more fully understood by considering the interpersonal origins of thwarted belongingness and its impact on suicidal thoughts.

The Interpersonal Origins of Thwarted Belongingness

There has been a history of efforts to link psychological wellbeing to the social context surrounding the individual. The sociologist, Emile Durkheim, in his classic text, *Le Suicide* (1897), was the first to conclude from empirical data, that deeply personal individual matters such as suicide were influenced by degrees of social integration. He described social integration as a sense of 'common conscience' encompassing interactions between individuals and a shared motivation towards common goals (Durkheim, 1897). From this perspective, weak social integration results in a lack of belonging to something which over time encourages individuals to experience a sense of worthlessness and in turn a greater propensity towards suicide. According to Durkheim, excessively high levels of social integration can also confer risk for suicide as individuals are so completely absorbed into the group that they lose their sense of value as an individual. Durkheim (1897) therefore proposed that moderate levels of social interaction were optimal for maintaining low rates of suicide, though the precise nature of these 'moderate levels of interaction' were not specified.

The psychologist, Abraham Maslow, (1954) in his book, *Motivation and Personality*, constructed a 'hierarchy of needs': a theory of psychological wellbeing that sets out a list of requirements that every human must strive to satisfy in order to achieve self-actualisation (a complete satisfaction with life). After basic physiological needs such as those for food, water and shelter are satisfied, social relations emerge as a fundamental human desire. The necessity to engage with others, derive a place in a group and to experience meaningful interpersonal relations are all included at the 'Love and Belongingness' level of need (Maslow, 1954). According to Maslow (1954), if this hierarchical level of need is not met, human beings are likely to become socially maladjusted and experience psychopathological difficulties.

In 1969, the psychiatrist, John Bowlby published the first of a trilogy of books on *Attachment and Loss*, in which he theorised that the healthy development of children

could only be achieved if they were able to form close bonds with other human beings. Bowlby, (1969) describes the initial bond between infant and caregiver as important in providing a secure basis for future development and in particular, future intimate relationships. Instinctual infant behaviours such as crying and smiling are explained as fulfilling both a physiological need for attention (such as crying when in pain) but also facilitating a relational attachment to a caregiver. Bowlby (1969) argued that an inability to develop adequately close affectionate relationships in early childhood is responsible for a range of negative psychological consequences.

A more modern interpretation of this comes from Social Network Theory (Berkman et al., 2000) which views a need for social connections as the primary force in developing a range of interpersonal social networks. Berkman et al., (2000) describe social networks as comprising of the ties which link individuals to each other, and which may be based on aspects such as shared interest, friendship, familial ties or shared occupational environments. Consistent with earlier sociological perspectives, Berkman and Kawachi (2000) position social networks within a broader social and cultural context where the size and structure of networks are determined by issues such as societal norms, political culture and socioeconomic factors. The theory extends this influence into the network's ability to provide opportunities for social support and engagement, which in turn impacts on health through the development of behavioural or psychological responses. For instance, if the network is unable to provide adequate social support, individuals may experience negative psychological consequences such as low self-esteem and an increased sense of distress, or carry out maladaptive behaviours such as increased alcohol and substance use, both of which represent a threat to psychological wellbeing.

Building on Bowlby's (1969) attachment hypothesis and the premise of social network theory (Berkman et al., 2000), Baumeister and Leary (1995) proposed that individuals are motivated to seek, develop and maintain social connections in order to meet an innate human need to belong. Belonging can arise out of relationships with any other individual (not just one individual as described by Bowlby), but typically takes time to build through a steady accumulation of shared experience, often framed within a

network or community of others. As such, short-term connections only with strangers would not be able to fulfil an individual's belongingness need. Baumeister and Leary (1995) explain that once an individual experiences an adequate sense of belongingness, they will no longer be motivated to seek further social connections. However, when connections are disrupted, and individuals are unable to repair or replace them, social isolation occurs, which risks any sense of belongingness becoming thwarted.

Social Isolation, Loneliness and their Impact on Suicidal Thoughts

Building on this earlier theoretical work, the IPTS model was developed around the premise that experiencing a lack of belonging is the result of two psychosocial processes, namely: social isolation and loneliness (Joiner, 2005; Van Orden et al., 2010).

Social Isolation. Van Orden et al., (2010) describe social isolation as a sense of disconnection from others which can occur in two ways. Firstly, by a reduction in: (i) the amount (number) of social connections an individual has with others, and/or (ii) the frequency with which one experiences contact with others. Typically, the risk of social isolation may arise as a result of instances such as the loss of a job or a prolonged illness. In these situations, a person's social network inevitably becomes smaller as their opportunities to make and maintain social connections become limited. In turn, as a consequence of experiencing a greater sense of social isolation, individuals are at a greater risk of starting to feel as though their efforts to belong (to socially connect) are being thwarted (blocked or denied), which can lead to psychological distress, including thoughts of suicide.

Secondly, even if the number and frequency of social encounters is maintained, social isolation may occur if the quality of these interpersonal relationship is inadequate (Baumeister & Leary, 1995). Such a situation may arise where a person has strong family connections and is well known within their community, but the nature of these interpersonal relationships is usually conflictual, exploitative and/or abusive. Such social isolation may typically be experienced by those who are frequently physically,

sexually and/or emotionally victimised, through interpersonal relationships dominated by experiences such as: domestic violence, bullying, harassment and neglect.

According to the IPTS, where either one of these conditions of social isolation is realised, an individual's sense of belongingness may be thwarted to the point at which the risk of passive suicidal ideations may occur. Here, such a state of mind may trigger occasional thoughts about whether 'life is worth the effort' or questions such as: 'if I died would anyone care?'. Such passive thoughts are often considered as mild, fairly common and not accompanied by any notion of actual intent (Van Orden et al., 2010).

In situations where there is a dramatic disruption to social connections, leading to sudden distortions in terms of both the frequency and quality of interpersonal relations, the need to belong may become more severely thwarted, and the desire to plan or even attempt suicide becomes a significant risk (Baumeister & Leary, 1995). Typically, this may occur in a range of situations involving significant social or personal change such as being expelled from school or the death of a loved family member (Rokach, 1989). Whatever the circumstances might be, the IPTS suggests that conditions of social isolation risk the emergence of a state of thwarted belongingness, which in turn can lead to the possibility of suicidality (Van Orden et al., 2010). One of the principal conduits believed to be responsible for triggering this process is loneliness (Berkman & Kawachi, 2000).

Loneliness. Loneliness is an emotional state that occurs in response to social isolation (Weiss, 1973). However, Baumeister and Leary, (1995) observed that both lonely and non-lonely people experienced similar levels of social contact and therefore proposed that social isolation in itself is not always a prerequisite for loneliness. This is evidenced by the fact that people can be socially isolated but not feel lonely. Instead, loneliness may be viewed as the "subjective perception of deficiencies in … social relationships" (Russell et al., 1984 p.1313). For example, an individual may experience many social connections but still feel lonely if they feel their social interactions are insufficient in some way. Loneliness is therefore a purely subjective experience

dependent on an individual's perception or evaluation of their interpersonal relationships.

Feeling lonely has been linked to a wide range of negative implications for both mental and physical wellbeing including depression (Alpass & Neville, 2003), substance misuse (Laudet et al., 2004), experiencing mental health difficulties, being out of work and using negative coping strategies to deal with stress (Matthews et al., 2018). These findings reinforce its role in acting as a mechanism by which experiences of social isolation may contribute to a range of psychopathological difficulties and a state of mind of thwarted belongingness – it is only if someone feels lonely as a result of their circumstances that social isolation may contribute to thwarted belongingness.

In summary, social isolation and loneliness have discrete but inter-related roles in contributing to experiencing a sense of thwarted belongingness. According to the IPTS model, social disconnection caused by either a lack of frequent or good quality interpersonal relationships can lead to social isolation. Where a person experiences a negative affective state regarding their interpersonal relationships (loneliness), the conditions for thwarted belongingness are created. It is this state of mind of thwarted belongingness which Joiner (2005) implicates in the development of suicidal thoughts.

PERCEIVED BURDENSOMENESS

Perceived burdensomeness is a state of mind in which individuals believe that they do not function within mutually supportive relationships whereby both parties contribute towards the needs of each other. Instead, they perceive their role as 'taker' rather than 'giver', to the extent that over time they start to view themselves as a burden on others (Joiner, 2005). The development of perceived burdensomeness is therefore based on an individual's evaluation of their self-worth as experienced through the extent of reciprocity in their social exchanges with others.

The inter-relationship between this construct and patterns of suicidality can be more fully understood by considering the interpersonal origins of perceived burdensomeness and its impact on suicidal thoughts.

The Interpersonal Origins of Perceived Burdensomeness

Perceptions of burden can be meaningfully understood within the context of Social Exchange Theory; an account of human relations originally formulated by the sociologist George Homans (Homans, 1961). Social Exchange Theory views social behaviour as underpinned by an exchange of resources – both tangible (economic, financial support, good and services) or intangible (information, knowledge, love and affection), which are interpreted by the parties involved as more or less rewarding in some way (Homans, 1961). The rules governing exchanges may be based on cultural norms, universal moral expectations or more formally stipulated contracts and invoices (Gouldner, 1960). The exchange of resources results in either a level of cost (time money or other opportunities) or reward (benefits or resources received) to each party. Actions which provide a benefit to others are expected to generate positive compensatory behaviours from the receiving parties. Behaviours eliciting positive reward are likely to be repeated such that the exchange becomes self-reinforcing (Thibault, 1959). Generally, such cost-benefit relationships enhance levels of interdependence and the reciprocal quality of social relationships (Cropanzano & Mitchell, 2005).

However, social exchanges based on limited reward but high costs, violate the social exchange norms (moral, social and economic) of reciprocity and result in perceptions that the party contributing less in the exchange is a burden (Helm et al., 1972). For example, according to Equity Theory, Walster et al., (1973) noted that individuals are motivated to maintain an equal balance between the costs and benefits incurred during the course of interpersonal relationships. However, in situations where an individual receives benefits from a social exchange, but experiences difficulties in reciprocating, unequal social relations are established in which the person unable to reciprocate may start to view themselves as a burden on others (McPherson et al., 2010).

Building on both Social Exchange Theory (Homans, 1958) and Equity Theory (Walster et al., 1973), the IPTS model argues that perceived burdensomeness occurs when people consider: (i) themselves as flawed in such a way that it limits their ability to contribute equally within social relationships, and (ii) that because of the costs imposed on others resulting from unequal social exchanges, their presence represents a liability and that others would therefore be better off without them (Van Orden et al., 2010).

Self-Concept, Self-Esteem and their impact on Suicidal Thoughts

Building on earlier theoretical work, Van Orden et al., (2010) propose that feelings of perceived burdensomeness occur in response to two psychosocial processes – namely a sense of the self as being flawed, and an underlying sense of low self-esteem. According to the IPTS these processes act as mechanisms by which perceived burdensomeness results in psychological distress and possible suicidal ideation.

Flawed Sense of Self. The philosopher and psychologist, William James, in his seminal text *The Principles of Psychology* (1890) described self-concept as a collection of personally held views about three aspects of the self: (i) the material self (comprised of the body and physical abilities); (ii) the social self (influenced by the views of, and relationships with others), and (iii) the spiritual self (made up of an individual's inner stream of thoughts, values and beliefs). From James' perspective, an individual's sense of self relies on their interaction with the environment around them and their own social circumstances.

Drawing on the work of James (1890), Marsh and Shavelson (1985) proposed a theoretical model of self-concept which similarly comprised of various aspects of self (e.g. academic, social and physical etc.). According to the theory, the development of a positive (or negative) sense of self is dependent on a number of external socially based conditions which relate to individual aspects of the self (such as physical and mental health, employment, academic achievement etc.) (Marsh, 1990). However, self-concept theory also elaborated on the work of James by proposing a hierarchical structure for

the various aspects of self, in which views about a particular element of the self (e.g. physical ability) contribute to a higher order level of physical self-concept, which in turn influences an individual's overall general sense of self-concept (Marsh, 1990). In this sense, the model proposes that differing aspects of the self, and the extent to which a person views them positively or not, are interrelated.

Building on this earlier theoretical work, the IPTS conceptualises perceived burdensomeness as developing in response to an individual's view that their sense of self (or any aspect of their self) is flawed in some way. In psychological terms, the notion of self-perceived burden arises when 'empathic concern [about] the impact on others ….. results in guilt, distress, feelings of responsibility, and a diminished sense of self' (McPherson et al., 2007, p425). Such a state of mind may typically occur amongst individuals within socially disadvantaged groups such as those experiencing physical disabilities (Khazem et al., 2015), those with mental health difficulties, those who experience infirmities as a result of age, and those who are long-term unemployed (Ellis et al., 2015). In essence, those who rely on others for support, or who are limited in the support they can provide within the context of social relationships, are at increased risk of experiencing perceived burdensomeness (Van Orden et al., 2010).

According to Van Orden et al., (2010), feelings of perceived burdensomeness confer risk for experiencing thoughts of suicide. One of the principal conduits believed to be responsible for triggering this process is the effect of a negatively held self-concept on an individual's level of self-esteem.

Lowered Self-Esteem. James (1890) proposed that a lowered self-esteem results from feelings of shame or humiliation, experienced when a person's ability or performance falls short of what they expected. Similarly, Bandurra (1986) described self-esteem as a personal measure of self-worth based on whether behaviours and actions are consistent with individual goals, values and expectations. Baumeister (1997) attributed low self-esteem to the shame felt when an individual's ideal sense of self does not match their actual sense of self. Self-esteem is therefore the affective component of an individual's evaluation of themselves (Baumeister et al., 2003).

Self-discrepancy theory (Higgins, 1987) provides a framework for explaining how the gap between actual and expected action or behaviour results in low self-esteem. The theory proposes that discrepancies between real and anticipated outcomes results in feelings of shame based on the view that someone's status has been lowered in the esteem of others. This manifests in the individual evaluating the aspect of themselves that did not perform as expected negatively, as well as producing aversive feelings of humiliation, which lower overall levels of self-esteem.

According to the IPTS, the extent to which an individual's negatively held view of their sense of self results in the development of perceived burdensomeness depends on whether their self-esteem is affected. For instance, an individual may experience functional limitations due to a physical disability which results in a dependence on others for some tasks. However, if there is no expectation by the individual of independent functioning in that domain, there will be no resulting feeling of shame and no sense of perceived burdensomeness on others. In circumstances where a sense of shame is evoked (perhaps in the case of unemployment where an individual feels they should be providing financially to others but is not currently able to meet this personal expectation), there is a threat to self-esteem which risks the sense of flawed self generating feelings of perceived burdensomeness. Where a sense of flawed self results in a lowered self-esteem, the conditions for perceived burdensomeness are created , increasing thoughts that an individual is expendable and resulting in a risk of suicidal thoughts (Van Orden et al., 2010).

ACQUIRED CAPABILITY

Most people who think about suicide do not attempt to end their own life (Nock et al., 2008). This finding rejects the idea that suicidality exists along a continuum of severity ranging from suicidal ideation to suicidal behaviours. Instead, Klonsky and May (2015) propose an 'ideas to action' framework which characterises suicidal thoughts and behaviours as discrete entities with separate origins. Within this framework, it is argued that many established risk factors for suicide (such as depression, loneliness and physical illness) actually only relate to the prediction of suicidal ideation rather than suicidal behaviours (Klonsky & May, 2014). As a result, the ability to effectively predict actual suicidal behaviour is limited (Franklin et al., 2016).

In an effort to improve risk prediction, the principal question that needs to be addressed is: why do some people who experience suicidal ideations go further and attempt to kill themselves? The IPTS model has attempted to address this question and explain why some people attempt suicide by stating that they possess a unique attribute which they refer to as acquired capability; the propensity towards suicidal actions. The inter-relationship between this construct and patterns of suicidality can be more fully understood by considering the interpersonal origins of acquired capability and its impact on suicidal behaviour.

The Interpersonal Origins of Acquired Capability

From a psycho-analytic background, Sigmund Freud (1922) in his book, *Beyond the Pleasure Principle*, theorised that humans possess an innate urge or energy (libido) referred to as the 'instinct for self-preservation' (Eros). According to Freud, the drive to maintain life motivates people towards behaviours consistent with survival, pleasure and reproduction and away from actions which represent a threat to these aims. As a result, humans possess a strong inherent urge to ensure the survival of themselves and those around them. The instinct for life preservation is the product of two psychological constructs; fear and pain. These psychological states are highly inter-related but have distinct roles. Fear acts to deter us from dangerous and life-threatening situations by

activating anxiety and encouraging us to run or escape (Bolles & Fanselow, 1980). Pain is an unpleasant sensation which stops us, when in life-threatening situations, from exacerbating the threat to life through our behavioural reactions in that moment (Eccleston & Crombez, 1999). Within a psychodynamic context, both fear and pain are therefore, in part instinctual.

In interpersonal terms, fear and pain are also the product of socialisation (whereby we come to understand from others, such as parents, what constitutes a dangerous situation) and learning (where we learn what pain feels like and develop a conditioned response). According to the IPTS, a relatively small number of people can develop (or acquire) the ability to overcome both the psychological barriers of fear and pain, and so as a consequence, be able to engage in life threatening behaviours. It is this acquired capability to carry out serious self-harm that differentiates those who think about suicide from the small minority of people who actually go on to make a suicide attempt with the intent to die.

Van Orden et al., (2010) propose that the capability for suicide is acquired through a process of 'habituation' (becoming used to something so that it is no longer painful or perceived as a threat). Habituation works to reduce fear, and increase tolerance levels to pain because repeated exposure to fearful or painful stimuli results in increased familiarity provoking a learned response that the stimulus (threatening situation) is no longer relevant. This in turn, reduces an innate avoidant response to such threatening situations (Thompson & Spencer, 1966). The way in which fear and pain sensitivity may be reduced through habituation can be understood more comprehensively through the processes of desensitisation and Opponent Process Theory.

Fear and the Process of Desensitisation

Research by the behavioural psychologist Joseph Wolpe (1954) investigating the mechanisms whereby a fearful response to a particular threat could be minimised, identified the role of desensitisation in reducing fear following repeated exposure to a specific threat. Wolpe and Lang (1964) propose that emotional arousal to an aversive

situation may be diminished over time as an individual is encouraged to 'relearn' their response following graduated and positively rewarded exposure to negative stimuli. Each time an individual is exposed to a negative event, their initial response is weakened and the 'relearned' response becomes strengthened. Over time therefore, the effect of conditioning an individual to react in an alternative way acts to reduce and eradicate the primary emotional response of fear.

In a similar theory of learning, Oetting and Donnermeyer (1998) maintained within Primary Socialisation Theory, that individuals learn and subsequently internalise what they consider to be normative behaviours based on their interpersonal exchanges with those around them. Recurring exposure to the dysfunctional or maladaptive behaviours of others (for instance within a family, group or organisational context) causes the behaviours observed and experienced to become internalised and adopted as behavioural norms. Accepting such behaviour norms as a template for their interpersonal relationships represents a learned process which serves to desensitise an individual to responding in an instinctive manner.

Building on the theories of desensitisation and socialisation, chronic or enduring exposure throughout the life course to interpersonal experiences characterised by frightening events or behaviours (such as violence, abuse or aggression), enable a process of socialisation whereby the response to such experiences becomes reinforced and marked by acceptance, and in extreme cases, justification (Mrug et al., 2016). The resulting desensitisation effect causes a diminished emotional responsiveness to the negative stimulus (the threatening environment), which means that a person is able to develop a fearlessness of situations and circumstances which are ordinarily high risk. The process of desensitisation therefore provides a mechanism by which an individual is able to become habituated to life-threatening situations over time and, in turn, overcome their innate self-preservation response. In these circumstances an individual may acquire the ability (through learned processes) to carry out life-threatening behaviours.

Pain and Opponent Process Theory

Opponent Process Theory (Solomon, 1980) describes the feelings provoked following any particular action or behaviour and proposes a means by which emotional states regarding an event may alter over time to help increase pain tolerance. For example, the theory states that if someone experiences a painful or provocative event, such as physical abuse, the initial response may be pain. Following repeated exposure to the same event, the individual may start to experience relief once the event is over, and over time, this state of relief will become the primary response to the event rather than the initial response of pain. The opponent process triggered by the aversive event therefore enables an individual to increase their tolerance to the pain they experience. Opponent Process Theory (Solomon, 1980) provides a mechanism by which an individual can increase their tolerance to a particular experience of pain over time, and, in turn, acquire the capability to overcome the inherent response to pain (which is to cease any activity which represents a threat to life). Once an individual has the means to overcome the protective barrier represented by pain, they are more able to carry out self-inflicted life-threatening behaviours. According to the IPTS, these conditions enable the acquiring of a capability to carry out self-harmful, and possibly suicidal behaviours.

A CRITICAL EVALUATION OF THE THEORETICAL KEY CONSTRUCTS IN INVESTIGATING THE IPTS

In drawing on both traditional theories of suicide and established theories of behaviour, the IPTS was the first theoretical model to differentiate between suicidal thoughts and actions, hypothesising that only those with both a desire to die and the capability to carry out potentially lethal behaviours are at risk of death by suicide. This model has greatly influenced suicide research over the last decade which has also seen the development of further models based on similar 'ideas to action' frameworks (Klonsky & May, 2015; O'Connor, 2011). However there remain areas within the IPTS model that require further theoretical and empirical scrutiny in order to further progress our understanding of suicidal behaviour.

In this section, five significant challenges to the IPTS framework will be critically considered. These critical issues evaluate the specificity of the IPTS model in terms of its potential as an effective and workable model of suicidality. The five key challenges are: (i) whether the IPTS is actually predictive of suicide risk or whether it merely represents a model of general psychological distress; (ii) whether the IPTS is a more effective model of suicidality than more traditional models of suicide based on demographic or psychopathological factors; (iii) clarifying the relationship between TB and PB; (iv) defining the nature and role of hopelessness within the IPTS, and (v) understanding the nature and mechanisms underpinning an acquired capability for suicide.

Is the IPTS Model Specific to Suicide Risk?

In terms of the first challenge (whether the IPTS model predicts suicidality or general mental health distress) it could be argued that the IPTS is too overly simplistic to predict suicidal conduct. The theory relies on three interpersonal states to explain the development of suicidal behaviours. However, it is acknowledged that suicide results from a complex interplay between internal states and external circumstances (O'Connor, 2011). The theory's author himself cautions against 'simplistic theorizing' in suicide research which lacks the conceptual precision to robustly explain suicidal behaviour (Joiner, Brown, & Wingate, 2005). Due to its simplistic nature, the IPTS approach may therefore lack the specificity to fully explain suicidal behaviours (Hjelmeland & Knizek, 2020), and instead may represent a more generic model of psychological distress.

Many mental health conditions have been found to co-morbidly occur with suicidal behaviours (Nock et al., 2008; Mann et al., 1999; Dumais et al., 2005). Those most commonly associated with suicide are depressive and anxiety disorders (Nock et al., 2010). It may be that the IPTS model relates to these forms of psychological distress rather than specifically to suicidal behaviour. Indeed, TB and PB were formulated according to a range of social and interpersonal states (including social isolation, loneliness, low self-esteem and shame) linked not only to suicidal behaviours but also

to depression and anxiety. It is therefore reasonable to question whether TB and PB may lead to depression or anxiety rather than act as indicators of risk specific to suicide.

An inability to tolerate or communicate feelings of psychological distress may manifest through non-suicidal self-injury (NSSI) (Nock, 2008). NSSI has been established as a strong predictor of suicidal behaviour (Nock et al., 2006) and has been implicated as a mechanism for facilitating the escalation in severity of suicidal behaviours over time (Whitlock et al., 2013). In the development of the IPTS model, Joiner et al. (2012) reference the common co-occurrence between NSSI and suicidal behaviour and posit that both behaviours may result from the same motives (such as an escape from negative feelings). NSSI has also been associated with factors such as social support and low self-esteem which contribute to feelings of TB and PB (Tatnell et al., 2013). Given these potential similarities in behavioural pathways, it could be argued that the IPTS constructs act not as specific predictors of suicide risk but as indicators of NSSI.

In order to resolve these questions, we need to test whether the IPTS constructs (TB and PB) are better at predicting forms of mental health distress or whether they relate more specifically to suicide risk.

Is the IPTS Better at Predicting Suicide Risk than other Established Sociodemographic or Psychopathological Models?

The second challenge to the IPTS is whether the model is better than already established frameworks for explaining suicide risk. Risk factors for suicide have traditionally been grouped into two main models of understanding: epidemiological (based on socio-demographic characteristics associated with suicide), and psychopathological (based on commonly reported relationships between mental health difficulties, such as depression and anxiety, with suicide). Each of these models appears to be helpful in explaining suicide risk in different groups of people. It is therefore important to understand whether the IPTS theory represents a more useful predictor of suicidal behaviour than traditional models.

The epidemiology of suicide is well reported. It is consistently found that more men die by suicide than women and that suicide rates generally increase with age (World Health Organisation, 2018). Although this may be useful in helping to understand suicide risk, static demographic variables are not amenable to change which limits their usefulness and applicability to therapeutic intervention. Therefore, there is scope for the IPTS to represent a more clinically useful way of understanding suicide risk compared to factors revealed through epidemiology. However, it has been argued that the IPTS neglects to adequately account for known fluctuations in risk according to age and gender (Hjelmeland & Knizek, 2020), and there is currently no evidence that the IPTS is better at predicting who is more likely to experience suicidal behaviours than traditional socio-demographic factors.

Psychopathological models of suicide rely on commonly made associations between mental health difficulties such as depression and suicidal behaviours (Hall et al., 1999). However, there is a flaw in the ability of such models to predict those who may be most at risk of suicide. For instance, we know that most people who experience suicidal behaviours are depressed, but not all of those who are depressed will experience suicidal behaviours (Handley et al., 2018; Hawton et al., 2013). Suicide risk assessment based on psychopathological factors therefore lack the specificity to determine those truly at risk of suicide (Ryan & Large, 2013).

The authors of the IPTS claim that the theory's constructs represent a proximal model of suicide risk (Joiner, 2005; Van Orden et al., 2010). Through this framework, factors such as age, sex or depression are not direct influencers of suicidal behaviour, but rather are mediated in their relationship with suicide by the IPTS constructs. The proximal nature of the IPTS constructs to suicidal behaviour enables a greater degree of specificity in predicting suicide risk.

To understand whether the IPTS is more useful than traditionally established models of suicide, we need to test its claims of proximity to suicide risk by determining whether it's constructs operate as mediators in the relationship between known suicide risk factors and suicidal behaviours.

How are TB and PB related to Each Other?

A third issue currently unresolved in the IPTS's understanding of suicidal behaviour is the nature of any relationship between the two constructs responsible for suicidal desire – TB and PB. The IPTS provides hypotheses about the causal processes by which TB and PB are proximal in conferring risk for suicidal behaviours, but it is silent on the nature and direction of any relationships between the constructs (Van Orden, 2014). There are three main possibilities: i) that only one of the constructs is important and the other is not; ii) they both matter but operate independently from each other, or iii) they are inter-related in some way.

In terms of the first proposition, Van Orden et al., (2010) suggest that both TB and PB are each sufficient causes of passive suicidal ideation meaning that each has a distinct and demonstrable relationship with milder forms of suicidal behaviour. According to the theory, the combination of both constructs increases the risk of more serious suicidal thoughts. However, it seems likely that the states of TB and PB could each fluctuate over time which then raises the question of whether particularly high levels of one construct could lead to more serious suicidal behaviour even in low to moderate levels of the other. A further difficulty with this proposition is that there is currently no coherent understanding of whether one construct is more important than the other or whether varying durations, intensities or frequencies of either TB and/or PB result in a greater risk for suicidal conduct (Ribeiro & Joiner, 2010). The unspecified parameters regarding TB and PB's unique contribution to forms of suicidal conduct represent a substantial challenge to the current status of the IPTS (Hjelmeland & Knizek, 2020).

The second proposition (that each construct is important but that they operate independently of each other) is formulated from the theory's assertion that TB and PB are presumed to be distinct and differentiable from each other (Van Orden et al., 2010). This infers that TB and PB co-exist and operate in parallel to influence suicide risk. However, both TB and PB logically seem to be more inter-dependent that the theory suggests (Ribeiro & Joiner, 2010). It seems entirely plausible that perceptions of burdensomeness might lead to feelings of social isolation for instance, which limits the

extent to which the theory can hold the constructs as independent from each other. It could also be argued that to experience feelings of burdensomeness on others requires a feeling of social connection such that in some cases high TB could be seen to be protective for PB (Hjelmeland & Knizek, 2020). This seems to suggest a greater connection between TB and PB than specified by the theory.

It therefore seems the third proposition (that TB and PB influence each other in some way) may better explain any relationship between the constructs that the hypotheses put forward by the theory's authors. However, if TB and PB are inter-dependent there is currently no theoretical indication of which may precede the other or how they may interact to predict varying severities of suicidal behaviour.

In order to better understand the relationship (if any) between TB and PB we need to determine whether each construct is uniquely related to specific forms of suicidal behaviour and identify whether there is any time ordering to the emergence of each construct.

What is the Role of Hopelessness within the IPTS Model?

Although hopelessness has been cited as central to the relationship between depression and suicide (Beck et al., 1990), and is consistently found to be a direct risk factor for suicidal behaviour (Hirsch et al., 2006; Klonsky et al., 2012; Qui et al., 2017), it is not clearly defined as an independent construct within the IPTS. Rather, the theory's authors characterise it in two differing ways. Firstly, Joiner, (2005) draws on cognitive vulnerability theories of hopelessness (which link a general predisposition to negative thinking and/or inability to think positively about the future) (Beck et al., 1975; Abramson et al., 1989) to describe hopelessness as a force which operates independently to amplify the effect of TB and PB. In this account of hopelessness, individuals with general tendencies towards negative or hopeless thinking would be more likely to apply such thinking to experiences of TB and PB thereby exacerbating their effect.

In the second account, Van Orden et al., (2010) hypothesise that a pervasive state of hopelessness is generated as a result of simultaneously holding both states of TB and PB. In this interpretation, hopelessness has an interactive effect on TB and PB which results in an active desire for suicide. Both accounts of hopelessness share the view that hopelessness must be specific to thoughts about whether the interpersonal states of TB and PB will ever change to exert an influence on suicidal behaviour. However, in presenting varying conceptualisations of hopelessness, the model is not clear in its understanding of how hopelessness operates, particularly alongside TB and PB, to influence suicide risk. This lack of clarity represents a significant challenge to the generativity of this aspect of the current IPTS framework (Higgins & Lewin, 2004). To accept Van Orden et al.'s (2010) account of hopelessness as a sequela of TB and PB seems to discount the longstanding association between hopelessness (as a cognitive style rather than response to interpersonal status) and suicide as consistently replicated in extant suicide research (Beck et al., 1990; Beck et al., 1975). Furthermore, it raises difficulties in operationalising hopelessness (Van Orden, 2014) – at what levels of hopelessness about either TB or PB does serious suicidal desire arise, and does an individual need to hold similar levels of hopelessness about each construct? Based on previous findings, it seems more intuitive to accept Joiner's (2005) view of hopelessness as a personality based disposition which then negatively influences an individual's perceptions of their interpersonal status. However, this perspective also raises questions about what exactly is hopelessness, how it operates and what is its value in relation to TB and PB?

In order to resolve these issues, we need to settle on a definition of hopelessness which is closely related to suicide. This, in turn will facilitate a more specific understanding of its role in the theory, and in the experience of suicidal behaviour.

Does Acquired Capability Help Predict Suicide Attempts?

The fifth key challenge to the IPTS model concerns it conceptualisation of the acquired capability construct. AC has a central role in the theory's ability to create a distinction between those who desire to die by suicide and those who are able to carry out attempts

to end their own lives. However, the current conceptualisation of AC as presented by the IPTS raises two key questions: (i) what it means for someone to have acquired a capability for suicide; and (ii) what is meant by a fearlessness about death in the context of suicidal behaviour.

The first of these questions relates to the IPTS's view of AC as a developmentally based trajectory whereby a capability for suicide gradually accumulates throughout the lifecourse. Under these conditions, capability is theorised to be a static construct which is achieved when exposure to painful and provocative events reaches a nominal (although unspecified) threshold (Van Orden et al., 2010). However, more recent interpretations have expanded the notion of capability to include genetic predispositions (Klonsky & May, 2015), access to lethal means (O'Connor, 2011) and individual contextual factors such as profession and access to health care (Smith & Cukrowicz, 2010). These models suggest that the point at which a capability for suicide is acquired varies person to person according to the interplay of a broad range of circumstances. Similarly, rather than being a threshold which remains unchanged once it is reached, it has been argued that capability may fluctuate in the short-term depending on alcohol and substance use, psychotic episodes and disassociate states (Bryan & Rudd, 2016). The formulation of AC within the IPTS may therefore be too narrow to provide an understanding of what a suicidal capability means for different people.

The second challenge arises from the IPTS model's understanding of a fearlessness about death (FAD). The theory states that an innate fear of death provokes a severely aversive, but protective effect in people thinking about carrying out suicidal behaviours (Van Orden et al., 2010). This fear is said to relate to one's own death generally rather than by suicide in particular (Ribeiro et al., 2014; Van Orden et al., 2010). However, literature has long-established fear of death to be a multidimensional construct (Collett & Lester, 1969; Lester, 1990) comprising of a range of death-related anxieties including fear of the process of dying, fear of being dead and fear of the unknown (Hoelter & Hoelter, 1978). Social and cultural contexts may also explain differences in individual experiences of death anxiety, with factors such as religious beliefs (Jong et

al., 2018) and societal approaches to death education (Moore & Williamson, 2003) being associated with a fear of death. In neglecting to consider fearlessness about death as a multifaceted attitude shaped by a variety of sociological factors and intra-personal beliefs, the IPTS interpretation of FAD may be too vague to identify and understand the specific mechanism by which fears about death contribute to acquired capability and further, to suicidal conduct.

In order to resolve these challenges, we need to understand whether acquired capability is specifically associated with increased risk of suicide attempt. This in turn will help identify specific aspects of AC which may act to influence different types of suicidal behaviour.

CONCLUSION

This chapter presented a critical assessment of the theoretical literature underpinning the key constructs of the IPTS framework. It concludes by proposing five challenges to the logical integrity of the IPTS which have yet to be fully evaluated. The next chapter uses a systematic literature review methodology to carry out a critical evaluation of the empirical literature surrounding the IPTS.

CHAPTER 2

THE INTERPERSONAL-PSYCHOLOGICAL THEORY OF SUICIDE: A SYSTEMATIC REVIEW

Chapter 1 critically considered the theoretical development of the principal constructs – thwarted belongingness (TB), perceived burdensomeness (PB) and acquired capability (AC) - underlying the IPTS model. The aim in this chapter is to evaluate the empirical evidence as to the relative merits of these IPTS constructs in terms of their utility in helping to predict the risk of suicidal behaviour.

The evidence to be considered in this chapter was drawn together following a systematic review of available research literature carried out between January 2019 and June 2019 that investigated each construct in term of its bi-variate or multi-variate influence on suicidality. In total, 39 studies were found that used the Interpersonal Needs Questionnaire (INQ; Van Orden 2009) to measure TB and PB constructs, and/or the Acquired Capability Scale (ACSS; Van Orden et al., 2008) to measure the AC construct. Across these studies, the dependent variable of suicidality was measured using nine different measures of suicidal ideation and a categorical measure of past suicide attempt. The most frequently used measure (N=13) was the Depressive Symptom Inventory – Suicidality Subscale (DSI-SS; Metalsky & Joiner, 1997) and the second most frequently used (N=12) was the Beck Scale for Suicidal Ideation (BSS; Beck et al., 1979). For a detailed account of the methodological processes employed in order to conduct the systematic search, please see Appendix 1. A summary of the characteristics of the studies selected can be found in Appendix 1 (table A1.5).

This chapter is organised around four sections: firstly, correlational evidence will be presented examining the unique influence of each construct on suicidality. This involves understanding the strength of bi-variate associations between TB and PB with suicidal ideation, as well as AC with suicidal behaviours. Secondly, multi-variate analyses will be summarised considering the influence each construct has on each other. This involves examining the interaction between TB

and PB in the context of suicidal ideation; the interactions between TB and AC or PB and AC in relation to both suicidal ideation and suicidal behaviours, and the interaction between all three IPTS constructs in predicting suicidal behaviour. Thirdly, correlational evidence will be presented examining the influence of TB and PB on suicidal ideation alongside the wider mental health related variables of depression and hopelessness. This involves understanding the causal pathways between established mental health risk factors for suicide and the IPTS constructs. Finally, the fourth section will critically evaluate the evidence presented by the systematic review and discuss the current challenges presented to the IPTS model.

INFLUENCE OF EACH IPTS CONSTRUCT ON SUICIDALITY

In order to assess whether each of the three main constructs has an influence on the risk of suicidality, the majority of studies measured their bi-variate association with suicidality using Pearson's correlations. The coefficient values reported by each of the constructs, TB, PB and AC are presented in table 2.1, and this data will be used throughout this section as the basis for presenting a more in-depth consideration of the evidence.

Thwarted Belongingness (TB) and Suicidal Ideation (SI)

As noted in chapter 1, TB describes a state of mind where an individual is experiencing social isolation and feelings of loneliness as a result of social relationships which are limited in quantity and/or quality. Most of the studies (N=38) reported on the bi-variate association between TB and suicidal ideations (SI). In fact, some papers reported several research outcomes providing a total of 43 correlational accounts (see table 2.1). The first thing to note about the data presented in column 3 of table 2.1 is that the majority (N=42 of 43; 98%) found a significant positive correlation, suggesting that as levels of TB increase, so does the risk of experiencing SI.

Table 2.1.

Correlation Coefficients between Thwarted Belongingness, Perceived Burdensomeness, Depression and Hopelessness with Suicidal Ideation and Acquired Capability with Suicidal Attempts

Study	N	Suicidal Ideation				Suicidal Attempts
		TB	PB	Depression	Hopelessness	AC
Acosta et al. (2017)	336	.38***	0.44***			
Allbaugh et al. (2017)	179	.00	-0.37**			
Anestis et al. (2015)	934	.37 **	0.38**	0.21**	0.28**	.05
Baams et al. (2015)	876	.34***	0.57***	0.62***		
Burke et al. (2016)	447	.29*	0.51*	0.5*		
Burke et al. (2018)	520					
Campos and Holden (2016)	200	.14*	0.33***	0.47***		
Chang et al. (2017)	195	.54***	0.64***	0.69***		
Chu, Buchman-Schmitt, Hom et al. (2016)	863	.50***	0.58***			-.11**
Chu, Podlogar et al (2016)	3377				.51***	
Chu, Hom et al. (2017) †	469	.32***				
Chu, Hom et al. (2017) ††	352	.40***				
Chu, Hom et al. (2017) †††	858	.50***				
Chu, Hom et al. (2018)	973	.39***	0.37***	0.51***	-.09***	.12***
Chu, Rogers et al. (2018) †	508	.35***	0.49***	0.47***		
Chu, Rogers et al. (2018) ††	310	.41***	0.53***	0.47***		.52**
Cramer et al.(2016)	572	.36***	0.46***			.10
DeShong et al. (2015)	348	.34**	0.39**			
Fink-Miller (2015)	419	.35**	0.41**			
Gallyer et al. (2018) †	944	.46***	0.44***			

Gallyer et al. (2018)††	241	.51***	0.55***			
Gauthier et al. (2014)	781	.32*	0.29*			
Hawkins et al. (2014)	215	.44***	0.56***	0.42***		.16*
Hom et al. (2017) ††	3386	.21**	0.55**	0.48**	-.27**	
Hom et al. (2017)†	937	.33**	0.32**			
Jahn et al. (2015)	167	.55***	0.48***	0.54***	0.43***	
Khazem et al. (2015)	903	.52***	0.42***			
Kleiman et al. (2014)	299	.28***	0.45***	0.31***		
Kwan et al. (2017)	602	.31**	0.39**			
Mbroh et al. (2018)	289	.19*	0.15	0.38**		.24**
O'Keefe et al. (2014)	171	.41**	0.47**	0.45**		
Pelton and Cassidy (2017)	163	.47*	0.61*	0.56*		
Pennings et al. (2017)	935	.37**	0.38**			
Puzia et al. (2014)	189	.15*	0.26**			
Ribeiro et al. (2015)	1208	.23***	0.38***		0.51***	
Rogers et al. (2017)	541	.76***	0.48***			
Silva et al. (2017)	3428	.20**	0.32**	0.65**		
Suh et al. (2016)	301	.37**	0.38**			
Suh et al. (2017)	544	.34**	.34**			
Suh et al. (2017)	390	.15**	.07			
Teismann et al. (2017)	236	.38**	0.46**	0.49**	.42**	
Tucker and Wingate (2014)	336	.38***	0.49***	0.41***		
Wilson et al. (2017)	282	.35**	0.54**	0.34**	.43**	
Wolford-Clevenger et al. (2016)	502	.20*	0.29**	0.23**		
Woodward et al. (2014)	210	.44*	0.67*	0.53*		

Note. TB= Thwarted Belongingness; PB=Perceived Burdensomeness; AC=Acquired Capability
* $p < .05$, ** $p < .01$, *** $p \leq .001$
† findings from study 1 within paper
†† findings from study 2 within paper
††† findings from study 3 within paper

In terms of effect size, Cohen (1988) suggests that coefficient values above *r*=.30 may be viewed as representing a moderate association while values above *r*=.5 constitute a strong association between variables. As such, it will be noted from table 2.1 that N=32 (74%) studies observed values within the range *r*=.31 (Kwan et al., 2017) to *r*=.76 (Rogers et al., 2017). Of these studies, the modal (most frequently reported coefficient) value, represented a moderate association at *r*=.35, while N=7 (16%) noted a strong relationship with coefficient scores above *r*=.5 (Cohen, 1988). According to Hemphill (2003) the magnitude of these values is above what is typical of bi-variate associations found within psychological research.

A recent study observing a moderate association between TB and SI was that of Hom et al., (2017). This study surveyed 937 military personnel using a 5-item version of the Interpersonal Needs Questionnaire (INQ; Van Orden, 2009) to measure TB, and the Suicidality Subscale of the Depressive Symptom Inventory (DSI-SS; Joiner et al., 2002) to assess the severity of suicidal thoughts. The authors concluded from their observed positive correlational value of *r*=.33, *p*<.01, that understanding participants' degree of TB experiences could be helpful in predicting suicidality; that increasing levels of social isolation and loneliness seem to be important to increasing the risk of suicidal behaviour.

However, of the N=42 accounts which found a positive association between TB and SI, N=10 (24%) noted effect sizes below *r*=.30, which Cohen (1988) would describe as small. The modal value of these studies was *r*=.20, with one study, involving a sample of 179 African American women with previous experience of both suicide attempt and exposure to intimate partner violence during the previous year failing to find a significant association between the two variables (Allbaugh et al., 2017). This suggests that while there seems to be a relationship between TB and SI, this does not always appear to be meaningful in terms of being able to imply a direct causal association.

A recent study observing a weak association between TB and SI was Wolford-Clevenger et al. (2016). This study surveyed 502 undergraduates, 23% of whom had experienced

physical assault in the previous year using the suicidality subscale of the Hopelessness Depression Symptom Questionnaire (HDSQ-SI; Metalsky & Joiner, 1997) to gauge the severity of suicidal thoughts. The authors concluded from their observed weak correlational value of *r*=.20, that TB may have a more complex relationship with SI than is generally believed, and that the extent of any association may be influenced by the nature of the population samples being studied. This is reflected in other studies which demonstrated weak correlative values between TB and SI, which surveyed populations vulnerable to social disconnection or isolation (including those who had experienced childhood abuse (e.g. Puzia et al., 2014) or were psychiatric inpatients (Mbroh et al., 2018).

From a systematic review of the evidence on the relationship between TB and SI, we can conclude that there seems to be a degree of association between these two variables, that this relationship is in a positive direction, and that the strength of the association is generally moderate (Cohen, 1988). However, a minority of the studies suggest that the bi-variate association may not be straightforward and as such may be influenced by its confluence with other risk factors, including the nature of the population being assessed.

Perceived Burdensomeness (PB) and Suicidal Ideation (SI)

As previously discussed in chapter 1, PB arises when someone perceives their sense of self to be flawed to such an extent that they do not feel that they contribute equally to their interpersonal relationships. Most papers (N=36) examined the bi-variate association between PB and SI. As with TB above, some papers reported several research findings providing a total of 40 correlational accounts. It can be seen from column 4 in table 2.1 that N=37 (93%) of the correlational accounts found a positive correlation between PB and SI, with coefficients ranging from *r*=.32 (Silva et al., 2017) to *r*=.67 (Woodward et al., 2014). Of these studies, the modal value was *r*=.38 representing a moderate association while N=11 (28%) noted a strong relationship with coefficient scores above *r*=.50 (Cohen,

1988). Again, this represents a magnitude of range typically greater than those found for bi-variate associations within psychological research (Hemphill, 2003).

A typical example of a study observing a strong association between PB and SI was Hawkins et al. (2014). This survey included a sample of 215 mental health outpatients and used the INQ to measure PB alongside the Beck Scale for Suicidal Ideation (BSS; Beck et al., 1979). The authors concluded from their finding (r=.56, p<.001) that as feelings of self-hate and being a burden to others increase so too does the likelihood of suicidal throughts occuring.

However, the findings were not always so clear-cut. For example, three studies in table 2.1 reported significant, but small bi-variate coefficient values at either r=.26, or r=.29. One example study showing a low association was, Puzia et al., (2014) who, using the INQ and BSS, surveyed 189 undergraduates who had experienced some degree of childhood abuse. The authors concluded that such low correlations (r=.26) may in part be explained by the nature of the participants' lifetime experiences of abuse (in this case, types of childhood trauma), which may have differing influences on an individual's self-esteem, sense of being a burden to others and their relationship to suicide.

As with TB, we can conclude that there seems to be a degree of association between PB and SI, that this relationship is in a positive direction, and that the stregth of the association is generally moderate (Cohen, 1988). However, the evidence seems inconclusive as to which construct has the strongest association with SI. With respect to TB, an important confounding factor might be the nature of the population being assessed, while with PB the nature of individual's lived experiences could have an important impact on the relationship between an emerging sense of self and suicidal thoughts.

Acquired Capability (AC) and Suicidal Behaviours (SB)

As we noted in chapter 1, AC describes the process by which an increased fearlessness about death and an increased physical tolerance to pain are acquired through repeated exposure to painful or provocative events and which contribute to a person's ability to act on they suicidal desire. AC is therefore commonly considered in the context of suicidal behaviours or attempts rather than SI. Seven studies reported bi-variate associations between AC and suicide attempts. As can be seen in column 7 of table 2.1, only one of these studies reported a significant and positive correlation coefficient value which was greater than r=.30.

In this study, Chu, Podlogar, et al., (2016) used the Acquired Capability for Suicide Scale – Fearlessness about Death (ACSS-FAD; Ribeiro et al., 2014) to survey a sample of 3,377 military personnel. The study reported that AC was associated with prior suicide attempts at the level of r=.52 (p<.01) representing a strong effect size (Cohen, 1988). The authors concluded that the existence of previous suicide attempts represents a mechanism by which an individual's fear of death may be reduced thereby increasing their levels of AC.

However, most of the studies (N=3) considering the relationship between AC and SB reported bi-variate correlation coefficient values which were significant but weak in effect size. These ranged from r=.12 (Chu, Hom et al., 2018) to r=.24 (Mbroh et al., 2018). One study reported a significant negative association between fearlessness about death and suicide attempt history (Chu, Buchman-Schmitt, Hom et al., 2016) which led the authors to conclude that AC may not necessarily have an effect on suicidal behaviour if there is no suicidal desire present.

In a general example of findings with a weak association between AC and SB, Hawkins et al., (2014) used the ACSS-FAD to survey a group of 215 community mental health patients. The authors concluded that the low correlation between AC and suicide attempt

(*r*=.16) may result from difficulties in assessing AC present at time points relative to suicide attempts occurring.

We can conclude from the evidence of the systematic review that there may be a relationship between AC and SB which is positive in direction, but which is generally weak in strength of association. The strength of the association may be influenced by the ability of current measures to reliably assess AC particularly if this fluctuates within individuals over time.

THE MODERATING INFLUENCE OF THE IPTS CONSTRUCTS ON SUICIDALITY

According to the IPTS, the joint presence of TB and PB create the conditions for suicidal desire, whilst the simultaneous addition of a capability for suicide confers risk for suicidal behaviours (Joiner, 2005; Van Orden et al., 2010). However, the theory is silent on the nature of any interaction between these constructs. This section examines the empirical evidence discussing the relationship between TB and PB. Within the current empirical literature, this is nearly exclusively examined by operationalising the relationship between TB and PB as an interaction effect. This section starts by looking at the influence of the two-way interaction between TB and PB on SI. Secondly, it considers the effect of any interactions between TB and AC or PB and AC on suicidality. Finally, it discusses the pattern of evidence about any three-way interaction between TB, PB and AC.

The Two-Way Interactive Effect of TB and PB on SI

The two-way interaction between TB and PB is typically used to operationalise the desire to die construct which consists of a combination of TB and PB. It describes how the amalgamation of TB and PB effects the experience of SI, and in particular whether the joint existence of high levels of both, produces an augmentative effect. N=10 studies

probed the interactive influence of TB and PB on SI using regression analyses. N=5 of these studies reported that the two-way interaction was significant and accounted for additional variance in a statistical model predicting SI. The amount of variance in each of the regression models explained by the two-way interaction ranged from 1.3% to 6.2% (*M*=3.6%, *Mdn*=3.8%)

An example of studies which observed a positive interaction effect of TB and PB is that of O'Keefe et al., (2014). In this study, the authors reported that the interaction had a significant effect on SI (β=.332, t[163]=2.88, p<.01). The interaction accounted for an incremental increase of 3.5% in the variance of the hierarchical regression model predicting SI. These findings led the authors to conclude that the interaction between TB and PB contributes to the development of SI over and above the individual effects of TB and PB.

Not all evidence was so categorical. Five studies reported that the two-way interaction had no significant effect on SI. In an example of these findings, Chu, Buchman-Schmitt, Hom et al., (2016) investigated the role of TB and PB in a large sample of firefighters (N=863). They found that the addition of the two-way interaction in step three of the hierarchical regression model accounted for no additional variance in the model over and above factors such as gender or TB and PB. In addition, there was no significant association between the TB/PB interaction and SI experienced over the career of the firefighters (t (6, 843)=-.71, p=.48). Based on these results, the authors suggest that an increase in either TB or PB alone may be sufficient to evoke an increase in SI and that the joint presence of both may not be necessary in invoking a desire to die.

A further study presented an interestingly mixed pattern of results. Suh et al., (2017) found that the two-way interaction had a significant effect on SI in US students (β=.21, p<.001) but was non-significant in a group of Korean students (β=.02, p=.71). The authors speculate that this may be due to cultural differences in the experiences of TB and PB which influence the extent to which they impact SI.

Overall, there was some support for an interactive positive effect of the combination of TB and PB on SI. However, the evidence seems inconclusive about whether such an effect may be consistently observed, particularly amongst different cultural populations which may experience either TB or PB differently.

The Interactive effects of either TB and AC or PB and AC on Suicidal Behaviours

The IPTS does not posit a specific role for the interactions of AC with either TB or PB. Instead, it describes the joint existence of TB and PB as fundamental to the development of SI, and the additional presence of AC as necessary in conferring risk for suicide attempts. However, in order to fully understand how the IPTS constructs inter-relate it is important to analyse any influence these interactions may have on suicidality.

Four studies reported on both the interactive effects of TB and AC, and PB and AC. In two of these the outcome measure was suicide attempts (Anestis et al., 2015; Chu, Buchman-Schmitt, Hom et al., 2016), while the remaining two studies measured the effect on SI (Silva et al., 2017; Suh et al., 2017). In terms of the interaction between TB and AC, there was very little evidence of any significant effect on either SI or suicide attempts. Both studies looking at the interaction in terms of SI and one of the studies considering its association with suicide attempts found no significant relationship.

In the remaining study, which examined the effect of the interaction between TB and AC in suicide attempts, Chu, Buchman-Schmitt, Hom et al., (2016) observed that the interaction significantly predicted career suicide attempts among a group of firefighters (N=863; β=.012, *p*=.02). This indicates that the joint influence of TB and AC may have an effect on the likelihood of experiencing suicidal behaviours. However, the reported effect was weak (OR=1.004) and only significant at step 3 of the regression analysis once the three-way interaction between TB, PB and AC was included in the analysis (at step 2 of

the regression, there was no significant interaction effect between TB and AC on suicide attempts). This pattern of results led the authors to speculate that either TB exists in lower levels in this population due to specific social support provided to firefighters, or that PB has a stronger effect on suicidality than TB.

In terms of any interaction between PB and AC, most studies (N=3) reported a significant positive effect on suicidality, such that the interaction increased the likelihood of experiencing either SI or SB. Of particular note was the study by Suh et al., (2017) which compared the interactive effects of the IPTS constructs on SI among two samples; one a group of US students (N=390) , and the second a group of students from Korea (N= 554). This study found that the interaction of PB and AC was significantly and positively related to SI in both groups. In addition, the interaction was a stronger predictor of SI than the two-way interaction of TB and PB (which was not significant) in the group of Korean students. The authors attribute this difference to potential cultural differences in the experience of TB, but the finding may also suggest that PB has a stronger relationship with suicidality than TB.

Not all studies found that the combined presence of PB and AC was positively linked to increased suicidality. For instance, Anestis et al., (2015) studied the effect of the interaction on past suicide attempts in a US military sample (N=934). The study found that the interaction of PB and AC was a significant negative predictor of suicide attempts (β=-.05, *p*=.005). This suggests that the interactive joint effect of PB and AC lowers the likelihood of having a history of suicide attempt. The authors propose that this finding confirms the requirement for all three constructs of the IPTS to be present in order to confer risk for suicidal behaviours.

In summary there was limited evidence supporting an interactive effect of TB and AC on suicidality. Findings suggest that the influence of any such interaction may be population specific with particular groups experiencing TB or AC differently. There were slightly more robust findings supporting an interaction effect of PB and AC on suicidality, and in

particular on SI. Any influence of the PB and AC interaction on suicidality may differ according to levels of TB, as would be expected according to the IPTS.

The Three-Way Interactive Effect between TB, PB and AC on Suicidal Behaviours

The three-way interaction describes the joint effect of experiencing a desire to die whilst simultaneously possessing an acquired capability for suicide. It is generally operationalised as an interaction between TB, PB and AC and is considered in the context of suicide attempts. According to the fundamental premise of the IPTS, the effect of the two-way interaction on suicide attempts is conditional on levels of AC. Three studies considered the role of the three-way interaction in predicting suicide attempts. Two of these found a positive and significant association. The sample sizes in these two studies had a mean and median value of N=899.

In the first example, Anestis et al., (2015) tested the main hypotheses of the IPTS in a US military sample (N=934; M_{age} = 27.05). The researchers carried out a hierarchical linear regression to understand how different variables contributed to the predication of suicide attempts. Findings revealed that the three-way interaction significantly predicted previous suicide attempts (t=4.20, p<.001), accounting for an additional 4.3% of the variance in the model predicting suicidal behaviour. In addition, the study was able to specify that the two-way interaction between thwarted belongingness and perceived burdensomeness was only significantly and positively related to lifetime suicide attempt at high levels of acquired capability, that it was not related to suicide attempt at mean levels of acquired capability and that it was significantly negatively related to suicidal behaviour at low levels of acquired capability. The authors conclude that acquired capability is a necessary component in the progression from suicidal desire (as represented by the interaction of TB and PB) to attempts to die by suicide.

In a second example, Chu, Hom et al., (2018) analysed the role of the three-way interaction in the relationship between NSSI and suicide attempts in a US military sample (N=973;

M_{age} =29.9). The study found that the three-way interaction was significant (p<.05, OR=1.001) in predicting the presence of a career suicide attempt. The authors also found that acquired capability had a significant moderating effect (index=0.0014, *SE*=0.001, 95% CI [0.0002, 0.0048]) on the interaction between thwarted belongingness and perceived burdensomeness, which led them to conclude that AC augments the effect of the interaction between TB and PB which in turn translates a desire for suicide into suicidal actions.

However, not all studies evidenced a significant effect of the three-way interaction on suicidal behaviours. One study reported that there was no association between the three-way interaction effect and previous suicide attempts (Fink-Miller, 2015). This study included a group of physicians (*N*=419) which led the authors to propose that the measure used was not able to accurately assess AC in this group. The authors suggested that there may be a ceiling effect in AC whereby populations routinely exposed to opportunities to habituate to pain and fear (such as physicians) require a higher level of AC in order to experience any effect.

In summary, there was emerging evidence that the three-way interaction between TB, PB and AC is associated with an increase in suicidal behaviours. However, findings supporting such an effect were limited in quantity and generally characterised by small effect sizes. There were also findings suggesting that the relationship between the three-way interaction and suicide attempts may be population-specific. Overall, support for the three-way interaction is therefore ambivalent.

MULTI-VARIATE INFLUENCE OF THE IPTS CONSTRUCTS ON DEPRESSION, HOPLESSNESS AND SUICIDALITY

As discussed in chapter 1, the IPTS recognises TB and PB as proximal risk factors for the development of SI. The previous section considered the empirical evidence about the bi-variate associations between the IPTS constructs and suicidality. The theory also accounts

for the role of established risk factors (such as depression and hopelessness) in suicidality through their inter-relationships with the IPTS constructs. This section therefore examines the empirical evidence considering such multi-variate associations. Table 2.2 presents the correlation coefficients values from studies considering the relationships between depression and hopelessness with either TB and/or PB, as well as the relationship between TB and PB.

The Relationship between TB and PB

In order to examine the effect of TB and PB in relationships between other variables and SI, we need to firstly understand how the two are related. The majority of studies (N=34) reported on the bi-variate correlation between TB and PB. As demonstrated in column 2 of table 2.2, each of these studies found a significant positive correlation suggesting that as levels of TB increase, so too does the risk of experiencing PB.

It can be seen from table 2.2, that the studies observed values ranging from r=.32 (Silva et al., 2017) to r=.76 (Rogers et al., 2017) with four modal values of r=.53, r=.58, r=.66, r=.70 generally representing associations which are strong in effect size (Cohen, 1988). In accordance with Cohen's (1988) account of the strength of effect size based on correlation coefficients (where values above r=.5 represent a strong association), it can be observed from table 2.2, that N=25 were within the range r=.52 (Gallyer et al., 2018) to r=.76 (Rogers et al., 2017) and therefore demonstrated a strong relationship between TB and PB beyond what is typical of bi-variate associations found in psychological research (Hemphill, 2003).

Findings from the systematic review therefore confirm that the association between TB and PB is positive and strong in effect suggesting that the two factors are closely related.

Table 2.2

Correlation Coefficients between Thwarted Belongingness, Perceived Burdensomeness, Depression and Hopelessness

Study	Thwarted Belonginess			Perceived Burdensomeness	
	PB	Depression	Hopelessness	Depression	Hopelessness
Acosta et al. (2017)					
Allbaugh et al. (2017)	.52**				
Anestis et al. (2015)	.70**	.47**	.49**	.42**	.46**
Baams et al. (2015)		.43***		.66***	
Burke et al. (2016)	.60*	.47*		.51*	
Burke et al. (2017)					
Campos and Holden (2016)	.38***	.37***		.44***	
Chang et al. (2017)	.54***	.57***	-.38*** [1]	.68***	-.29*** [1]
Chu, Buchman-Schmitt, Hom et al. (2016)	.54***				
Chu, Podlogar et al (2016)					
Chu, Hom et al. (2017) †					
Chu, Hom et al. (2017) ††					
Chu, Hom et al. (2017) †††					
Chu, Hom et al. (2018)	.33***	.66***	-.26***	.59***	.05
Chu, Rogers et al. (2018) †	.46***	.42***		.56***	
Chu, Rogers et al. (2018) ††	.58***	.60***		.60***	
Cramer et al.(2016)	.44***				
DeShong et al. (2015)	.70**				
Fink-Miller (2015)	.58**				
Gallyer et al. (2018) †	.52***				

Gallyer et al. (2018)††	.54***				
Gauthier et al. (2014)	.59*				
Hawkins et al. (2014)	.59**	.61***		.61***	
Hom et al. (2017) ††		.77**	.29**	.67**	
Hom et al. (2017)†					
Jahn et al. (2015)	.47***	.62***	.54***	.51***	.50***
Khazem et al. (2015)	.67***				
Kleiman et al. (2014)	.66***	.46***		.42***	
Kwan et al. (2017)	.64**				
Mbroh et al. (2018)	.64**	.30**		.24**	
O'Keefe et al. (2014)	.74**	.73**		.74**	
Pelton and Cassidy (2017)	.66*	.61*			
Pennings et al. (2017)	.70**				
Puzia et al. (2014)	.67**				
Ribeiro et al. (2015)	.36**		.33***		.60***
Rogers et al. (2017)	.76***				
Silva et al. (2017)	.32**	.85**		.73**	
Suh et al. (2016)	.49**				
Suh et al. (2017)					
Teismann et al. (2017)	.49**	.48**	.55**	.55**	.45**
Tucker and Wingate (2014)	.66***	.64***		.65***	
Wilson et al. (2017)	.58**	.54**	.60**	.52**	.58**
Wolford-Clevenger et al. (2016)	.54**	.58**		.45**	
Woodward et al. (2014)	.68*	.66*		.68*	

Note. TB= Thwarted Belongingness; PB=Perceived Burdensomeness; AC=Acquired Capability

* p <.05, ** p <.01, *** $p \leq .001$

† findings from study 1 within paper

†† findings from study 2 within paper

††† findings from study 3 within paper

[1] hopelessness measured using future orientation scale: results relate to hope rather than hopelessness

The Influence of TB, PB and Depression on SI

Depression is a well-established risk factor for suicidality with much research finding support for its role in SI (see for example Hawton et al., 2013). As the association between TB and PB is confirmed, the next step in understanding their influence in the context of depression is to analyse the extent of any relationship between depression and SI. Among the studies considering its relationship with SI (N=22), depression was measured using five measures: the two most frequently used being the Beck Depression Inventory (BDI-II; Beck et al., 1996; N=9), and versions of the Center for Epidemiological Studies Depression Scale (CESD; Radloff, 1977; N=7). Two studies reported on instances of major depressive events rather than relying on a psychometric scale to assess depression.

Around half of the 39 studies (N=22, 54%) reported the bi-variate correlation coefficients for depression and SI. It can be noted from column 3 of table 2.1, that all of these found a significant positive correlation, indicating that as levels of depression increase, so too does the risk of experiencing SI. By way of effect sizes, it can be observed from table 2.1 that N=20 (90%) studies found values within the range r=.31 (Kleiman et al., 2014) to r=.69 (Chang et al., 2017). The modal value of these studies was r=.47 which represents a moderate association between depression and SI. N=8 (36%) studies reported a strong association between the two with coefficient values above r=.5 (Cohen, 1988).

In order to confirm whether TB and PB influence the relationship between depression and SI, the next step is to examine the association between depression and each IPTS construct. In terms of TB, 21 studies observed bi-variate correlations with depression. It can be noted from table 2.2 that all of these were positive significant associations suggesting that as levels of TB increase, so does the risk of experiencing depression.

In regards to effect size, table 2.2 illustrates that the studies reported correlation coefficient values which ranged from r=.30 (Mbroh et al., 2018) to r=.85 (Silva et al., 2017). Among

the reported coefficients, there were three modal values, one of which represented a modest association at *r*=.47, while N=2 represented strong associations at *r*=.61 and *r*=.66. Of the studies, N=13 (62%) demonstrated a strong relationship with coefficient values greater than *r*=.5 (Cohen, 1988), which are above what is generally expected in psychological research (Hemphill, 2003).

Of the overall studies, N=20 reported correlation coefficient values relating to the association between PB and depression. As illustrated in column 4 of table 2.2, all of these were positive and significant proposing that as levels of PB increase, so too does the risk of depressive symptoms. It can be seen in table 2.2, that N=19 (95%) of these studies recorded values greater than *r*=.3 (see Cohen, 1988) in the range of *r*=.42 (Kleiman et al., 2014) to *r*=.74 (O'Keefe et al., 2014). The three modal values of this range (r=.42, r=.51 and r=.68) demonstrate a moderate to strong relationship between PB and depression.

Overall, the bi-variate correlation coefficients reported by the studies propose that the strength of associations with depression were moderate to strong in the case of SI, strong for TB and moderate for PB. This pattern of results may be explained by the IPTS constructs having a mediational effect on the relationship between depression and SI. In order to understand any mediational influences of depression, TB and PB on SI, some studies (N=2) used multi-variate analyses (Kleiman et al., 2014; Campos & Holden, 2016). Both studies found support for a model where depression influenced SI indirectly through its effect on TB and PB.

In an example of the indirect relationship between depression and SI as mediated by TB and PB, Kleiman et al. (2014) used the Center for Epidemiological Studies Depression scale (CESD; Radloff, 1977) to survey a sample of 508 undergraduates. The study found that the indirect association between depression and SI, as mediated by TB and PB was significant (b=.05, 95%CI [0.02, 0.10], *p*=.01). According to this result, single unit increases in depression are associated with a .05 unit increase in SI through its effect on TB and PB. The authors conclude that experiences of depression influence an individual's

perceptions of their own belonging and burdensomeness on others. If these beliefs about TB and PB are negatively held, they may in turn lead to SI. In this account, depression exerts an influence on SI distally through TB and PB which operate as proximal risk factors for SI.

Overall, we can conclude from the systematic review evidence that there appears to be a positive relationship between depression and SI as well as associations between SI with both TB and PB. There was a degree of support that depression may influence SI indirectly through its relationships with TB and PB although this was limited in quantity. Additionally, in many studies, depression was included as a covariate and its effect was statistically controlled for, further limiting the ability to understand its relationship in contributing to SI.

The Influence of Hopelessness on TB, PB and SI

In addition to depression, a second state of mind with well-established links to suicidality is hopelessness. Hopelessness is defined as the negative thoughts held about an individual's own future (Stotland, 1969). It is often considered to be a sub-type of depression which is typically observed in suicidal people (Beck et al., 1974, 1990). It is therefore important to understand how it may interact with the constructs of the IPTS to influence SI.

A small proportion of the studies reported bi-variate correlation coefficients describing the relationship between hopelessness and SI (N=8; 21%). As observed in column 6 of table 2.1, it can be noted that most of the studies (N=6; 67%) reported that hopelessness was positively and significantly correlated with SI, such that as levels of hopelessness increase, so too does the risk of experiencing SI. In terms of effect sizes, table 2.1 demonstrates that N=5 (56%) of the studies found values ranging from r=.42 (Teismann et al., 2017) to r=.51 (Ribeiro et al., 2015; Chu, Podlogar, et al., 2016). The modal value of these studies was

r=.51, representing a strong association between hopelessness and SI. Overall, N=3 (60%) reported moderate associations (where *r*=.30 – *r*=.49) and N=2 (40%) found strong correlation coefficient values (*r*≥.50).

However, not all studies found a robust relationship. It can be noted from table 2.1 that N=4 (44%) studies reported correlation coefficient values which were weak in effect size (*r*<.30; Cohen, 1988). In addition, some studies (N=2; 22%) found that hopelessness was negatively associated with SI suggesting that as levels of hopelessness increase, the likelihood of experiencing SI reduces. This result seems counter-intuitive and in one case, the authors attribute this unexpected result to the low internal consistency of the scale used (Hom et al., 2017). In the other example, Chu, Hom et al. (2018) reported a significant negative correlation between hopelessness and SI (*r*=-.09, *p*<.05) within the total population of the study which was made up of people with a lifetime history of NSSI and a control group of those with no previously reported NSSI. Interestingly, however, this finding did not hold within the NSSI group, where hopelessness was positively associated with SI (*r*=.25, *p*≤.001). This may be indicative of population specific differences in the relationship between hopelessness and SI.

Despite some mixed results, the overall majority of findings confirmed a moderate to strong positive association between hopelessness and SI. As there appears to be an association between hopelessness and SI, the next step is to understand whether TB and PB influence this relationship by considering how they are related to hopelessness. In terms of TB, eight studies observed bi-variate correlations with hopelessness (see column 4 of table 2.2). All but one of these demonstrated a positive association between hopelessness and SI with correlation coefficients within the range of *r*=.29 (Hom et al., 2017) to *r*=.60 (Wilson et al., 2017). There was no modal value of these studies, but the median value was *r*=.45 suggesting a moderate strength relationship between TB and hopelessness.

However, there were some contrary findings. For instance, Hom et al. (2017) found a correlation value of *r*=.29, suggesting a relatively weak association between hopelessness

and TB (Cohen, 1988). Additionally, Chu, Hom et al. (2018) reported negative correlation coefficient values for the relationship between hopelessness and TB across two groups of US military who either had or had not experienced past NSSI. These findings propose some challenges to the positive linear relationship as presented by the majority of the studies. However, in the main, there appears to be a moderate association between TB and hopelessness.

In terms of the relationship between PB and hopelessness, seven studies reported on the bi-variate association between the two. As can be noted from column 6 of table 2.2, the majority (N=6 of 7; 86%) found a significant positive correlation, suggesting that as levels of PB increase, so too do levels of hopelessness. One study reported a negative correlation (Chang et al., 2017), but this was due to the use of a scale measuring future orientation (hope) rather than hopelessness, and findings were therefore consistent with hopelessness being positively related to PB.

As observed in table 2.2, N=5 (71%) of the studies reported effect sizes within the range r=.45 (Teismann et al., 2017) to r=.60 (Ribeiro et al., 2015). Of these studies, the median value was r=.53, suggesting a relatively strong association (Cohen, 1988), while N=3 (43%) noted a strong relationship with coefficient scores equal to or above r=.50.

One study, (Chu, Hom et al., 2018) reported a correlative value which was weak in effect size (r=.12, $p\leq$.001) and which was found within the control group (military with no previous experience of NSSI). Within the sample who had prior experience of NSSI, the relationship between PB and hopelessness was not significant. As with the findings of this study in relation to TB and hopelessness, the results may indicate that the relationship between PB and hopelessness fluctuates according to differences in the characteristics of differing populations. In general, however results from all the studies seem to highlight a robust relationship between PB and hopelessness.

In addition to relying on bi-variate associations to explain the relationship between hopelessness and either TB or PB, some studies (N=2) considered the variables and their influence on SI in the context of a mediation model. Each reported conflicting results. In support of a mediational relationship whereby TB and PB act as proximal risk factors for SI, Chang et al., (2017) reported that future orientation (as assessed by the Future Orientation Scale; FOS; Hirsch et al., 2006) was indirectly related to SI through both TB and PB. This suggests that hopelessness acts distally through TB and PB to influence SI.

However, Wilson et al., (2017) used a hierarchical regression model to understand the influence of a range of factors on SI and found that hopelessness remained a significant predictor of SI (β=.22, *p*=.004) even once TB, PB and their interaction were included in the model. This result suggests that TB and PB do not mediate the association between hopelessness and SI, and that hopelessness may operate directly to influence suicidal thoughts.

The overall picture therefore suggests that hopelessness is associated with SI, as well as with both TB and PB. Evidence demonstrating the nature of any inter-relationships between hopelessness and the IPTS constructs in conferring risk for SI, is however, currently inconsistent. Some findings suggest that hopelessness influences SI directly, while other results propose that TB and PB mediate any association. Therefore, the exact pathways by which hopelessness impacts on SI with TB and PB are unclear.

A CRITICAL EVALUATION OF THE OPERATIONALISATION OF KEY CONSTRUCTS IN INVESTIGATING THE IPTS

As noted in the overall introduction, this study has identified six principal questions pertinent to exploring the IPTS as an effective model for predicting suicidal behaviours. These are set out in table 2.3.

Table 2.3

Summary of Research Questions

Research Question Number	Research Question
Question 1	Do the IPTS constructs (TB, PB and hopelessness) represent general predictors of mental health distress or are they specific predictors of suicidal risk?
Question 2	Do the IPTS constructs (TB, PB and hopelessness) remain important predictors of risk when compared with the more traditional, well established epidemiological (age, sex, and relationship status) and psychopathological (depression and anxiety) risk factors already known to influence suicidal behaviour?
Question 3	Do the IPTS constructs (TB and PB) function as proximal risk factors (mediators) between depression and suicidal behaviour?
Question 4	Are the IPTS constructs (TB and PB) related to each other?
Question 5	Does hopelessness mediate the relationship between TB and PB?
Question 6	Does the IPTS construct of AC help predict suicide attempts?

This section considers the key variables important in addressing these questions. Specifically, there are seven subsections, six of which discuss the operationalisation of each key variable, namely: suicidal behaviour; depression; thwarted belongingness;

perceived burdensomeness; hopelessness, and acquired capability for suicide. The seventh subsection discusses the analytical framework which will be employed. Each subsection is organised around a discussion of: (i) the related theoretical issues and complexities discussed in Chapter 1; (ii) the empirical challenges raised by the critical review of the literature in this Chapter, and (iii) proposals for resolving these challenges in this study.

'Suicidal Behaviour' as a Principal Dependent Variable

Central to testing the main hypotheses of the IPTS is the ability to develop outcome variables which differentiate between suicidal thoughts and behaviours (Van Orden, 2014). However, as discussed in the overall introduction, suicide research is characterised by an inconsistent and confusing nomenclature of terms (Carroll et al., 1996). This makes it difficult to develop a shared understanding of how 'suicidal behaviour' can be operationalised (Silverman et al., 2007). As a result, empirical studies tend to rely on commonly used measures which assess the recent severity of suicidal thoughts as an outcome variable (see for instance Beck Scale for Suicidal Ideation; BSS; Beck et al., 1979, and the Depressive Symptom Inventory Suicidality Subscale; DSI-SS; Joiner et al., 2002).

There are two key limitations to this approach. Firstly, these measures do not support the operationalisation of three levels of suicidal behaviour as conceptualised within the IPTS. They are not able to discriminate between passive and active suicidal thoughts and there is no ability to measure suicide attempts. Secondly, in asking only about recent thoughts, these measures do not take sufficient account of previous suicidal actions which are known to contribute to the likelihood of future behaviour (Hawton et al., 2013; Teismann et al., 2017).

The Suicidal Behaviors Questionnaire (SBQ-R; Osman et al., 2001) is a self-report measure based around four factors: (i) history of suicidal thoughts and behaviours; (ii) frequency of suicidal thoughts; (iii) intent as expressed to others, and (iv) future likelihood of suicidal behaviours. The inclusion of items about previous history and communication of intent has enabled this study to operationalise three distinct levels of suicidal behaviour

(passive suicidal ideation, active suicidal thoughts and potentially lethal suicide attempts) as required to test the key assumptions of the IPTS model (see methods chapter 3 for further information).

Sociodemographic Risk Factors (Age, Sex and Relationship Status) as Covariates

As noted in Chapter 1, demographic variables such as age, sex and relationship status are traditionally understood as influencing suicidal behaviour. It could be expected therefore, that studies looking at the IPTS model might develop a consistent approach which takes account of these well-established links. Yet, evidence from the systematic review presented in this chapter suggests that this is not always the case.

Many studies fail to consistently control for the effects of demographic factors such as age or gender (see for example Hawkins et al., 2014; Kleiman, Liu and Riskind, 2014; Chu, Hom et al., 2017). In cases where these variables are controlled for, studies often fail to discuss their impact (see for example Tucker and Wingate, 2014; Silva et al., 2017). Furthermore, studies seem to pay limited attention, if any, to the role of relationship status as a potential confounding variable, despite its importance within the IPTS model. Failure to adequately take account of these sociodemographic factors limits the generalisability of findings to wider populations thereby restricting our understanding of the IPTS model.

In order to consider the research questions 1-6, it is important to adequately control for the effects of key sociodemographic variables. One way to achieve this is to include them as covariates in the analyses. Furthermore, incorporating a variable relating to relationship status will help ensure that findings can be understood and applied to wider populations regardless of sociodemographic status.

Operationalising Depression as the Principal Independent Variable

As discussed in Chapter 1, the conceptual role of depression within the IPTS is unclear. Given the abundance of evidence supporting an association between depression and suicide however, it seems probable that depression has an important part to play in any

model of suicidal behaviour. Indeed, the authors of the theory acknowledge this likelihood and call for further empirical scrutiny of the interplay between depression with the IPTS constructs (Van Orden, 2014).

Most empirical studies manage uncertainty about the role of depression by separating it from their analyses and controlling for its effect. This approach is common practice as it enables studies to consider the effect of IPTS constructs regardless of depression status (Rogers et al., 2018). However, it does not allow for a thorough test of the IPTS assumption that depression acts through TB and PB to influence suicidal behaviours.

In order to formulate an understanding of the role of depression in the IPTS which accords with its prominence in extant literature, this study will establish it as the principal independent variable. This facilitates the examination of both its direct relationship with suicidal behaviour, and its indirect effect through TB and PB, which is crucial in evaluating the claims of the IPTS model.

Establishing depression as the principal independent variable requires a reliable measure. However, concerns have been raised that commonly used scales (such as the Beck Depression Inventory; BDI; Beck et al., 1996), contain items relating to suicidal ideation (this reflects overlap in the clinical presentation between the two constructs; Pompili, 2019). It could be argued that use of such scales makes it difficult for studies to truly understand the effect of depression separate from that of suicidal ideation.

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was developed to identify cases of depression in general hospital settings and therefore depends only on core psychological features, rather than symptoms such as physical complaints and suicidal thoughts, to measure depression. Use of this scale enables this study to formulate an understanding of depression which is separate to that of suicidal ideation.

Thwarted Belongingness and Perceived Burdensomeness as Mediating Variables in in the relationship between Depression and Suicidal Behaviour

The IPTS proposes a framework for testing the effects of TB and PB by hypothesising that each construct is independently associated with passive suicidal ideation, and that their joint presence (alongside hopelessness) leads to active suicidal thoughts (Van Orden et al., 2010). However, as noted in Chapter 1, there is no theoretical indication to help resolve key questions about whether one construct is more prominent than another or if there is any time ordering of the constructs.

In the absence of any clear steer from the theory, empirical studies interpret the relationship between TB and PB as an interaction whereby their combined presence has an augmenting effect on each other and on suicidal behaviour. However, this strategy may be an overly simplistic approach to testing the IPTS model (Van Orden, 2014). For instance, it does not advance understanding about whether the constructs operate in serial or parallel, or whether there is any time ordering to their effect. Additionally, there can be conceptual complexities in understanding and communicating the clinical relevance of findings from moderation models testing the relationship between TB and PB. This strategy therefore limits the ability of results to draw specific conclusions about the interactive nature of the constructs as initially hypothesised by the IPTS model (Joiner et al., 2005).

Operationalising TB and PB as mediating variables is beneficial in three ways. Firstly, it enables this study to test the independent effect of each construct on suicidal behaviour. This is in line with the fundamental hypothesis of the IPTS that holding one of either state will result in passive suicidal ideations. Secondly, in conjunction with defining depression as the principal independent variable, it supports examination of the theory's assumption that TB and PB are proximal risk factors which interact in some way to increase the likelihood of experiencing active suicidal desire. Thirdly, it facilitates the production of parsimonious findings containing greater clinical value than those with more complex means of analysis.

In order to establish TB and PB as mediating variables, it is important that their presence is validly and accurately captured. Research outside the scope of the review in this chapter has often sought to use proxy measure of each construct (such as loneliness; Alpass & Neville, 2005, or self-esteem; Sun & Hui, 2007). However the choice of proxy measures is inconsistent and often results in limited precision to attributing findings directly to TB and/or PB (Anestis et al., 2016). Due to these difficulties, this study included the use of a standardised psychometric (namely the INQ; Van Orden, 2009) as part of the criteria for inclusion in this review.

However, use of the INQ is not without controversy. Firstly, it could be argued that the field has become over-reliant on this single measure of TB and PB to the exclusion of more diverse and possibly, robust tests of the IPTS model (Van Orden, 2014). Secondly, concerns have been raised that some versions of the INQ may not be able to sufficiently discriminate between TB and PB due to difficulties posed by multicollinearity and inconsistent factor structures (Van Orden et al., 2008; Freedenthal et al., 2011).

The INQ-10, has been shown to demonstrate the most consistent factor structure and best concurrent predictive validity compared with other versions of the INQ (Hill et al., 2015). Its use in this study therefore provides the best assurance possible, when using this scale, that TB and PB have been accurately assessed. Adopting a cautious approach in its use by recognising its limitations, further mitigates against concerns raised about its validity.

Hopelessness as a Mediating Variable in the Relationship between Depression and Suicidal Behaviour

The theoretical basis for the emergence of hopelessness has yet to be settled by the IPTS (see Chapter 1 for a full discussion). One hypothesis is that it emerges in response to the joint presence of TB and PB and contributes to the development of active suicidal thoughts (Van Orden et al., 2010). It might therefore be expected that empirical tests of the theory would seek to understand any inter-relationships between hopelessness and the IPTS constructs. However, as revealed in this chapter, and noted by Van Orden (2014), most

studies investigate the influence of hopelessness independently of any association with either TB or PB.

In order to answer research question five ("Does hopelessness mediate the relationship between TB and PB?"), this study will establish hopelessness as a mediating variable in the relationship between depression and suicidal behaviour. This will enable testing of how it relates both, to TB and PB, as well as suicidal behaviour, which is in line with the propositions of the IPTS.

Clarifying the role of hopelessness and its inter-relationships with other key variables in the development of suicidal behaviour requires a suitable measure. Most studies rely on generic measures which consider hopelessness to be a general pattern of negative thinking or feeling about the future (such as the Beck Hopelessness Scale; BHS; Beck et al., 1974). However, this approach is not consistent with the IPTS view of hopelessness as a state of mind specific to suicide or interpersonal status. As a result, is not considered to be an appropriate means of operationalising hopelessness (Van Orden, 2014).

Devising a measure of hopelessness which is able to isolate any feelings of hopelessness specific to suicide will help this study fully consider its influence on TB, PB and suicidal behaviour. This is in line with the IPTS hypothesis about hopelessness. One way in which this could be simply achieved would be to assess responses to a single item on the Suicide Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001) which asks about future suicide potential.

Acquired Capability for Suicide as a Mediating Variable in the Relationship between Depression and Suicidal Behaviour

The IPTS hypothesises that a capability for suicide depends on acquiring two components; a reduced fear of death (which is required for the transition from active suicidal thoughts to suicidal intent), and an increased tolerance to pain (which is required in the transition of suicidal intent to suicide attempt) (Van Orden et al., 2010). However, critics refer to studies unable to find a link between AC and suicidal behaviour (Fink-Miller, 2015; Chu,

Buchman-Schmitt, Hom et al., 2016) as evidence that this formulation is both too vague and overly simplistic (Collett and Lester, 1969; Hjelmeland & Knizek, 2020).

Uncertainty around the structure of AC extends to its operationalisation and accurate assessment. The sole existing scale – the ACSS (Van Orden et al., 2008), is based on the two-factor structure which underpins the constructs theoretical conceptualisation. Unsurprisingly, it's use (or that of one of its variants) is almost ubiquitous in studies investigating the IPTS. However, factor analyses suggest that the scale better supports models containing anywhere from three (Smith et al., 2013) to five-factors (Rimkeviciene et al., 2017). Furthermore, the use of a single item ("I could kill myself if I wanted to") has been found to be as reliable as the whole scale in assessing suicide risk in clinical settings (Rimkeviciene et al., 2016). These findings question the relevance of each item in the ACSS to understanding suicide.

In order to consider research question six ("Does the construct of AC help predict suicide attempts?"), it is important to resolve two issues. Firstly, a correlation matrix will be used to perform an individual item analysis on the ACSS-20. This will establish those items (if any) that are uniquely associated with suicide risk. Secondly, these items will be included as mediating variables in the relationship between depression and different levels of suicidal behaviour. This will determine whether items are specific to suicidal attempts or are generic factors held across all suicide groups.

Mediational Analysis as an Analytical Framework

Findings from the systematic review of the literature presented in this chapter show that the main body of existing research around the IPTS characterises the relationships between the IPTS constructs and suicidal behaviours as bi-variate correlational associations. In contrast, the proposals for operationalising each of the six key variables important in investigating the research questions within the current study are based on a mediational analytical framework. A number of studies have considered the role of the IPTS constructs within such a framework. For instance, in a mediational analysis investigating the relationship between insomnia and suicidal ideation, Chu, Hom et al. (2017) reported a

mediational role for TB. The authors concluded that this provided support for the IPTS premise that TB is a proximal risk factor in the development of suicidal behaviour. However, the study did not include depression as a factor in its analysis despite it's established relaitonship with both insomnia and suicide. Further, the role of PB was not considered. The authors were therefore unable to consider either the role of depression or the effect of any association between PB and TB on the relationship between insomnia and suicidal thoughts.

In a second example of studies employing mediational analysis, Suh et al. (2016) identfied PB as a mediator of the relationship between nightmare distress and suicidal ideation. However the study found no such role for TB. The authors attribute this finding to the likelihood that nightmares could disrupt the sleep of others leading to increased feelings of burdensomeness. However, the study relied on a single outcome variable of suicidal ideation. It's ability to determine whether TB and PB may have had different mediational roles depending on the degree of suicidal behaviour, was therefore limited.

The current study aims to contribute to existing knowledge of suicidal behaviour through investigating each of the six research questions (see table 2.3). Addressing the challenges raised by the systematic literature review through the operationalisation of the six key variables as described earlier will enable this study to expand on findings of existing similar mediational studies in three important ways. Firstly, the analysis will include covariates (age, sex and relationship status) known to have an influence on suicidal behaviour. Secondly, the established role of depression in suicidal behaviour will be considered through its formulation as the independent variable. Thirdly, the study will differentiate between different degrees of suicidal behaviour which will help identify any difference in the roles of TB and PB in suicidal behaviour.

CONCLUSION

This chapter presented the results of a systematic review of empirical literature discussing the IPTS. It also makes proposals for operationalising each of the six key variables

important in investigating the research questions within the current study, which overcome the empirical challenges raised both in this chapter and in the theoretical literature review presented in chapter 1. The next chapter provides a more detailed discussion of the methodological processes adopted in carrying out the current study.

CHAPTER 3

METHODS

The critical commentary of the theoretical and empirical literature surrounding the IPTS presented in chapters 1 and 2 raised a number of important questions about the effectiveness of the IPTS model in explaining suicidal behaviour. This chapter sets out the processes underlying the development, design and implementation of a study whereby these issues could be investigated with the overall aim of understanding whether the IPTS framework represents an effective model of suicidal behaviour.

This chapter is organised around six principal areas. The first discusses the research design. This includes the overall aims and objectives of the study and describes the epistemological approach which guides the research design. The second section describes the methods used to develop an appropriate research sample and discusses aspects such as sample size and methods of recruiting participants. The third section details the materials used. This includes a description and rationale for each of the scales employed in the current study. The fourth section explains the procedures followed for data collection including the method used and the process followed by those participating in the research. The fifth section discusses the ethical considerations of the study. This is particularly important due to the sensitive nature of suicide research. The final section contains details about the data analysis methods which includes information about the preparation of data for analysis and the analytic approach adopted in relation to each research question.

RESEARCH DESIGN

Aims and Objectives

The overall aim of this research was to investigate the effectiveness of the IPTS model in understanding and predicting suicidal behaviour. As noted in the introduction, in order to achieve this, six research questions were devised which draw from the

theoretical and empirical challenges discussed in the critical analyses presented in chapters 1 and 2. These are presented in table 3.1.

Table 3.1

Summary of Research Questions

Question 1	Do the IPTS constructs (TB, PB and hopelessness) represent general predictors of mental health distress or are they specific predictors of suicidal risk?
Question 2	Do the IPTS constructs (TB, PB and hopelessness) remain important predictors of risk when compared with the more traditional, well established epidemiological (age, sex and relationship status) and psychopathological (depression and anxiety) risk factors already known to influence suicidal behaviour?
Question 3	Do the IPTS constructs (TB and PB) function as proximal risk factors (mediators) between depression and suicidal behaviour?
Question 4	Are the IPTS constructs (TB and PB) related to each other?
Question 5	Does hopelessness mediate the relationship between TB and PB?
Question 6	Does the IPTS construct of AC help predict suicide attempts?

Note. TB=Thwarted Belongingness; PB=Perceived Burdensomeness; AC=Acquired Capability.

Epistemological position

The current study is concerned with investigating the influence of different constructs (such as TB, PB and hopelessness) on suicidal behaviour. An inherent assumption of the research design, therefore, is that the effects of factors relating to TB and PB (such as loneliness, social isolation and poor self-esteem) are able to be objectively measured

and understood. This is consistent with a positivist research philosophy in which the dominant ontological position is that knowledge exists as a distinct and objectively observable entity (Kress, 2011). Positivists view objective methods such as those pursued in disciplines of natural sciences as pivotal to the development of knowledge in the social sciences (Crook & Garratt, 2005). Whilst alternative interpretivist approaches may offer important insights into understanding the individual subjective experience of suicidal behaviour (Hjelmeland & Knizek, 2010), a positivist perspective offers the current study two key strengths.

Firstly, adopting a research design rooted in positivism enabled the current study to define a series of research questions which provide a scientifically falsifiable test of the IPTS model. The importance of theoretically driven hypothesis testing in furthering suicide research is well-recognised (Leenaars et al., 1997). Indeed, in her review of the usefulness of the IPTS, Van Orden (2014) refers to the need to ensure that the theory's hypotheses are 'coherent and falsifiable' (Popper, 1959). Positivist research designs therefore provide a framework whereby claims about the association between specific risk factors (e.g. loneliness, poor self-esteem, depression) and suicide can be scientifically tested.

Secondly, a positivist research design allowed this study to understand the role of the IPTS constructs in suicidal behaviour at a population level. While not discounting the value of exploratory approaches which seek to understand suicide as a deeply personal and individualised behavioural response to social circumstances, this study acknowledges that contributory factors and behavioural outcomes may be separated and analysed independently in order to produce findings which can be applied to wider populations.

Thesis Research Design

A study's research design refers to the framework which governs its data collection and analysis (Bryman, 2001). In line with a positivist approach, the current study used a cross-sectional design which enabled the collection of a large body of quantitative data at a given point in time. A cross-sectional research design offered two important

benefits. Firstly, this study required an approach which facilitated the collection and analysis of a large number of variables. Cross-sectional designs enable researchers to analyse the correlative relationships between variables and therefore identify any potential patterns of association which may exist. This was an important strength of the current study which aimed to test the effectiveness of the IPTS model through investigating six research questions containing multiple dependent and independent variables and covariates (controlled variables) (for further information about the variables used in this study, please see 'Methods of Data Analysis' section of this chapter).

Secondly, the cross-sectional research design enabled the collection of data from a sufficient number of cases to determine the different groups required. It was important that the current study was able to detect differences and compare findings between groups of people experiencing different degrees of suicidal behaviour.

SAMPLING

Sampling refers to the processes used to select and recruit appropriate types and numbers of participants to take part in research (Bryman, 2001). The selection of a suitable sampling strategy therefore has important consequences for the nature of the data collected and the resulting generalisability of any findings to others. This section describes the sampling strategy used in this study and is structured into six sections which detail: (i) the rationale for the selected sampling design; (ii) the sampling method used to recruit participants; (iii) the sample size targeted by the study; (iv) the inclusion criteria used to select participants; (v) how the sample population was accessed, and (vi) demographic characteristics about the nature of the sample population obtained.

Sampling Design

A study's sampling design determines the group from which the participants will be recruited and ensures that the sample size represents enough power to carry out relevant analysis (Barker et al., 2012). A traditional positivist research ambition is to

generate objective and universal laws (Hasan, 2016). As a result, many positivists typically espouse the benefits of a probability sampling design whereby the sample of the population from which participants are drawn is selected at random (Halfpenny, 1987). It is argued that this represents the strongest basis for applying findings to wider populations (Bornstein et al., 2013). However, sampling in suicide research is constrained by the generally low base rate with which the outcome behaviour of suicide occurs. This can restrict the ability to develop datasets large enough to ensure sufficient statistical power to perform valid and reliable analyses (Goldsmith et al., 2002). A non-probability sampling design was therefore employed by the current study. This provided the flexibility to target particular groups of individuals, known to be at higher risk of suicidal behaviours and helped ensure that different suicidal groups were represented in the sample.

Sampling Method

The sampling method refers to the way in which participants are selected from the target population which has been determined by the sampling design (Barker et al., 2012). In order to ensure that participants represented a balanced spread of experience in relation to suicidal behaviours (ranging from none to potentially lethal suicide attempts), the current study drew on two forms of non-probability sampling method. The first was convenience sampling. This relates simply to recruiting a sample that is convenient and available (Bryman, 2001). It has been argued that formulating a sample based on convenience compromises the ability to generalise findings as it is impossible to determine the true representativeness of the sample (Etikan et al., 2016). However, while acknowledging this limitation, this approach represented a simple and resource effective sampling method for the current study (Bornstein et al., 2013). The second was purposive sampling whereby specific groups known to be at increased risk of experiencing suicidal behaviours were approached (Bryman, 2001). By nature, this approach is biased in the sample population it produces. However, in terms of the current study, it offered the opportunity to ensure that the sample adequately represented a range of suicidal experiences.

Sample Size

Determining sample size required a considered balance between two key factors. Firstly, the size of the sample needed to be sufficient enough to detect an effect or relationship with confidence (McCready, 2006: 147). In general terms, increasing the size of the sample can help improve the precision of how well a sample reflects its target population and therefore produce more robust findings (Cohen, 1988). However, the second key consideration concerned the resources and time available to the study and represented a limitation to the sample size.

In order to acquire an approximate understanding of the sample sizes required to generate sufficient statistical power, this study relied on two means. Firstly, online calculators were used to calculate an estimated minimum requirement for sample size for the regression models. G*Power analysis (Faul et al., 2007) indicated that to detect findings at a significance level of $p \leq .01$, a minimum sample size of N=143 would be required. Secondly, Fritz and Mackinnon (2007) provide indicative tables of minimum required sample sizes for achieving sufficient statistical power when carrying out mediation analyses. According to their findings, when using percentile bootstrapping mediational techniques, to achieve a power level =0.8, the minimum sample size required ranged from N=36 to N=162, depending on the effect size required.

Criteria for Recruiting Participants

As previously noted, in order to overcome difficulties in obtaining sufficient numbers of participants with different types of suicidal experience, the current study devised a series of inclusion and exclusion criteria which centred around three areas to guide participant recruitment. The first area related to age. Participation was restricted to those aged between 18 years old and 60 years old. The minimum age of 18 years was applied due to ethical concerns about maintaining the safety of children and young adults. British Psychological Society guidelines (2009) recommend that in the case of participants under the age of 18 years old, consent, where possible, should be obtained from a parent or guardian. This would have compromised the anonymous nature of the study. The upper age limit for taking part in the study was 60 years old. This aimed to

minimise any bias which may result from different life experiences in older adults. For instance, patterns of suicidal behaviour are known to differ in older adults. Rates of suicidal behaviour are reported to occur more frequently (Kim et al., 2014), and have been associated with the onset of greater physical and mental health problems specific to this group (O'Connell et al., 2004).

Secondly, as suicidal behaviour formed the outcome variable for the current study, there was an inclusion category related to previous experience of suicidal ideations, thoughts and behaviours. Those with no previous suicidal experience were also included to ensure that data reflected as broad a range of behaviours as possible.

Thirdly, participation in the study was open only to those currently residing in the general community setting. This meant that people who were hospital in-patients were excluded from the study. This criterion was applied due to ethical concerns and resource constraints involved in gaining appropriate and safe access to clinical populations.

Accessing the Sample Population

Guided by the inclusion and exclusion criteria access to the sample population was gained through online advertising of the survey. Advertising was targeted towards organisations and groups identified as being able to reach potential participants with a history of suicidal behaviour. Previous research has reported that suicidal behaviour may occur more frequently in people with developmental difficulties including autism (Richa et al., 2014) and attention deficit hyperactivity disorder (Balazs & Kereszteny, 2017). Such groups were therefore targeted to help ensure that the data represented a strong cross-section of people who have experienced suicidal behaviour.

The study was advertised on a variety of online platforms including: (i) social media channels such as the personal pages of the researchers as well as organisational pages of related organisations and other interested parties (such as Mental Health Autism and SEN parental support Facebook pages); (ii) websites regularly accessed by relevant

parties such as the Suicide Behaviour Research Lab at the University of Glasgow and mental health support websites such as MIND), and (iii) the Coventry University Psychology database of research for undergraduates to earn participatory credits when taking part.

All advertisements of the study included an online link to the survey which was hosted by the Qualtrics software survey platform. Clicking on the link took individuals to the participant information sheet (which was also available for separate download to print or store for future reference; see Appendix 2). Participants were required to complete a consent form before they were able to access the survey questions.

Sample Descriptive Statistics

Socio-Demographic Characteristics. After data screening and preparation, the final sample comprised of N=254 participants. 191 participants (75.2%) were female and 63 (24.8%) were male. Ages ranged from 18-57 years old (M_{age}=25.23, *SD*=9.65). In total, 141 (55.5%) individuals described their relationship status as 'single', while the remaining 113 participants (45.5%) said that they were in some form of relationship. Of those who were in a relationship, 80 (31.5% of the total) said that they were not formally married/in a civil partnership, while 33 participants (13%) of the total were married or in a civil partnership.

Mental Health and Developmental Characteristics. When asked whether they had been formally diagnosed with a mental health condition, 75 people (29.5%) said that they had, while 179 participants (70.5%) said that they had not. Of those who self-reported a mental health related diagnosis, 23 described having only one diagnosis, 27 reported having at least two significant mental health difficulties, and 25 reported comorbid conditions involving three or more mental health conditions.
When asked whether they had been formally diagnosed with a developmental condition, 31 participants (12.2%) said that they had, while 223 individuals (87.8%) said that they had not. Characteristics of the mental health and developmental difficulties of the sample are shown in table 3.2.

Table 3.2

Mental Health and Developmental Difficulty Characteristics of the Study Sample

Diagnosis	Number of participants	% of total sample
Mental Health Diagnosis		
Depression	61	24
Anxiety	45	17.7
Anorexic Eating Disorder	13	5.1
Bulimic Eating Disorder	19	7.5
Personality Disorder	13	5.1
Schizophrenia	3	1.2
Developmental Diagnosis		
Autism Spectrum Condition	17	6.7
Dyslexia	10	3.9
Dyspraxia	3	1.2
Learning Difficulties	1	.4

Oversampling was used to ensure that different suicidal groups were represented in the sample (for further details see the 'Sampling Design' and 'Sampling Method' sections of this chapter). Participants were grouped according to the degree of suicidal behaviour they had previously experienced. Table 3.3 shows the numbers of participants in each suicidal category (the 'Methods of Data Analysis' section of this chapter provides a detailed explanation of the operationalisation of suicidal behaviour in relation to each group).

Table 3.3

Number of Participants by Suicidal Group

Suicidal Behaviour Group	No. of participants	Percentage of total sample
Never	61	24
Thinkers	64	25.2
Planners (no intent)	42	16.5
Planners (with intent)	37	14.6
Attempters (1)	15	5.9
Attempters (2)	35	13.8

Note. Based on responses to item 1 of Suicidal Behavior Questionnaire-Revised (SBQ-R): Nevers=participants who responded as 'never'; Thinkers= participants who responded as 'it was just a brief passing thought'; Planners(no intent)= participants who responded as 'I have had a plan at least once to kill myself but did not try to do it'; Planners(with intent)= participants who responded as 'I have had a plan at least once to kill myself and really wanted to die'; Attempters (1)= participants who responded as 'I have attempted to kill myself, but did not want to die'; Attempters (2)= participants who responded as 'I have attempted to kill myself, and really hoped to die'.

MEASURES (MATERIALS)

A combination of general background questionnaire and psychometric scales were used to measure key variables associated with understanding whether the IPTS constructs mediate the relationship between depression and suicidal behaviour. This section provides details of the measures used in relation to each variable and is structured into two sections. The first concerns details about the psychometric measurement of the independent variables (depression, anxiety, TB, PB, hopelessness and AC). The second section discusses the measurement of the dependent variable (suicidal behaviour).

Measurement of Independent Variables

Table 3.4 provides a summary of the current study's independent variables and their measurement.

Table 3.4

Operationalisation and Measurement of Independent Variables

Variable	Nature of variable	Measurement
Age	Continuous	Response to age item on demographic questionnaire
Sex	Dichotomous	Response to biological sex item on demographic questionnaire
Relationship status	Categorical	Response to relevant item on demographic questionnaire
Previous self-harm	Dichotomous	Response to relevant item on demographic questionnaire
Depression	Continuous	Score on depression subscale of HADS
Anxiety	Continuous	Score on anxiety subscale of HADS
MH Distress	Continuous	Total score on HADS
TB	Continuous	TB subscale of INQ-10
PB	Continuous	PB subscale of INQ-10
Hopelessness	Continuous	Item 4 of SBQ-R
AC	Continuous	Total score on ACSS-20

Note. TB= Thwarted Belongingness; PB=Perceived Burdensomeness; MH=Mental Health; AC=Acquired Capability; HADS=Hospital Anxiety and Depression Scale; INQ-10=Interpersonal Needs Questionnaire-10; SB=Suicidal Behaviour; SBQ-R=Suicide Behavior Questionnaire-Revised; ACSS=Acquired Capability for Suicide Scale.

It will be noted from table 3.4 that the overall online survey comprised of two parts. The first was a general questionnaire devised by the researcher with the aim of collecting information about characteristics of participants including: age; sex;

relationship status, and previous self-harming behaviour (see Appendix 3 for a copy of the background questionnaire). The second part of the questionnaire consisted of four standardised psychometric self-report scales intended to measure the following key variables: (i) depression; (ii) TB; (iii) PB; and (iv) AC. A copy of the scales used can be found in appendices 4-7. Details about the measurement of variables which relied on psychometric self-report scales are provided below.

Measuring Depression and Anxiety. The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was used to measure depression and provide an indication of mental health distress. It is a self-report screening tool consisting of two subscales relating to anxiety and depression. It was developed as a means for physicians to discriminate between anxiety and depression as distinct from each other as well as from symptoms of other physical conditions. The authors therefore avoided including physical measures of anxiety and depression such as headaches or insomnia within the scale. A copy of the scale can be found in appendix 4.

Each subscale contains seven items which are self-rated against a 4-point scale measuring frequency or severity of experience (such as 'most of the time', 'not at all' and 'very much indeed'). The total scored on each subscale determines cases of anxiety or depression from doubtful or borderline cases and non-cases (Zigmond & Snaith, 1983). Possible scores for each subscale range from 0 (where there is no indication of depression or anxiety) to 21 (where high levels of anxiety/depression are indicated).

Each subscale has demonstrated high reliability. Reliability correlations for each item in the anxiety scale calculated by the authors when developing the scale ranged from α=.76 to α=.41 (Spearmans correlation) (Zigmond & Snaith, 1983). Further studies have established reliability coefficients (Cronbach's alpha) to range from α=.76 to α= .93 (Bjelland, AA, TT, & D., 2002). For the depression scale, the original reliability of each item ranged from α= .60 to α=.30 (Zigmond & Snaith, 1983), with further research finding Cronbach's alpha coefficients for the depression scale overall ranging from α=.67 to α=.90 (Bjelland et al., 2002). The reliability score demonstrated by this scale in the current study can be found in table 3.5.

Previous research has reported concerns that online use of the scale may result in inflated scores compared to its use in face to face settings (Buchanan, 2003). However, its use in the current study presented two important benefits: (i) the self-report nature of the scale and its brief number of questions contributed to its functionality as an online tool which did not represent a significant burden in terms of number of responses for participants, and (ii) in contrast to many other commonly used measures of depression and anxiety, it contains no items relating to suicide which helped reduce any overlap in measurement with the outcome dependent variable.

Measuring Thwarted Belongingness and Perceived Burdensomeness. The Interpersonal Needs Questionnaire (INQ-10; Van Orden, 2009) provided a measure of TB and PB. The scale was developed specifically to measure the suicidal desire constructs of the IPTS and is a 10 item self-report measure containing two five-item subscales which separately assess each construct. Possible scores for each subscale range from 5 to 35 as respondents answer the extent to which a statement reflects how they feel across a seven-point Likert scale ranging from "not at all true for me" to "very true for me". A copy of the scale can be found in Appendix 5.

The INQ-10 has demonstrated good reliability with an alpha coefficient for the burdensomeness subscale found to represent α= .93 and α=.82 for the belonginess element (Anestis et al.; Van Orden et al., 2008). Various versions of the INQ, based on subsets of the original 25 item scale have been used in groups including general population based samples (Christensen et al., 2014), university undergraduates (Rasmussen & Wingate, 2011) and outpatients from a psychology clinic (Silva et al., 2015). Table 3.5 provides details of the internal consistency of the scale in terms of the current study.

In a review of five versions of the INQ, Hill et al. (2015), found that suicidal ideation was predicted independently by both thwarted belongingness and perceived burdensomeness only using the 10-item version of the scale. This finding, combined with the preference to use the briefest measures possible without compromising

validity in the online survey, formed the rationale for the use of the INQ-10 version in this research.

Measuring Hopelessness. It will be noted from table 3.4 that the operationalisation of most independent variables was based on responses to relevant items or psychometric scales. However, with regards to the measurement and operationalisation of hopelessness, the current study employed a different approach.

The current theoretical position about what constitutes hopelessness in the context of the IPTS is ambiguous (see chapters 1 and 2). As a consequence, and in line with previous studies reporting that a behavioural specific form of hopelessness may be more important than a general measure of trait-based hopelessness (Tucker et al., 2018), this study aimed to develop a measure of hopelessness specifically related to an individual's feelings about suicide. Item 4 of the SBQ-R asks: 'How likely is it that you will attempt suicide someday?' and is intended to assess perceived likelihood of future suicide attempt. This item was therefore used to measure suicide-specific hopelessness.

Measuring Acquired Capability. The Acquired Capability for Suicide Scale (ACSS-20; Van Orden et al., 2008) was devised specifically to measure the Acquired Capability (AC) construct of the IPTS model. It consists of 20 self-report items designed to assess two factors of AC: fearlessness about death, and reduced pain tolerance. Responses to individual statements are measured across a five-point Likert scale ranging from "not at all like me" to "very much like me". Total possible scores can range from 0 – 80. A copy of the scale can be found in appendix 6.

The ACSS-20 has been widely used in a variety of populations including military (Bryan et al., 2010), undergraduates (Burke et al., 2018) and those experiencing depression (Smith, Cukrowicz et al., 2010). It has also been shown to demonstrate good levels of internal consistency (Smith et al., 2015). The scale's reliability scores for the current study can be found in table 3.5.

However, a number of studies have found that the scale is unable to consistently discriminate between those with or without a previous history of suicide attempt (Burke

et al., 2018). In addition, there appears to be uncertainty about its underlying factor structure scale (Rimkeviciene et al., 2017; Smith et al., 2013) which has resulted in claims that it may not accurately reflect the construct as conceptualised by the IPTS (Ribeiro et al., 2014). Whilst noting these concerns, and in the absence of any validated alternative scale, the current study used the scale with caution.

Scale Reliability

Internal consistency refers to the ability of a scale to reliably measure the concept it is designed for. It may be calculated by analysing the correlative values both amongst the items as well as with the subject the scale is testing to produce a Cronbach's Alpha coefficient. Values greater than α=.70 are generally considered acceptable (Gliem & Gliem, 2003). Table 3.5 presents the Cronbach Alpha reliability coefficients for each scale used in the current study.

Table 3.5

Cronbach Alpha Reliability Coefficients for Each Scale

Variable	Number of items included	Reliability (α)
Suicidal Risk	3 items	.855
Depression	7 items	.827
Anxiety	7 items	.847
Thwarted Belongingness	5 items	.876
Perceived Burdensomeness	5 items	.959
Acquired Capability	20 items	.739

It can be seen from table 3.5 that all scales demonstrated good levels of internal consistency with values ranging from α=.739 to α=.959.

Measurement of Dependent Variable

Measuring Suicidal Behaviour. The Suicidal Behaviour Questionnaire – Revised (SBQ-R; Osman et al., 2001) was used to measure the outcome variable of suicidal behaviour. It is a self-report measure containing four items. Each item concerns a different element of suicidality including: (i) lifetime occurrence of suicidal thoughts and/or behaviours; (ii) frequency of experiencing suicidal thoughts in the past year; (iii) the threat of any attempt to end own life, and, (iv) the likelihood of any future suicidal behaviour. A copy of the scale can be found in appendix 7.

Responses to particular items were used to form three measures. Firstly, overall suicidal risk (which was intended to capture a participant's overall risk of experiencing suicidal behaviours) was formed as a continuous variable using responses to questions 1, 2 and 3 of the SBQ-R. Secondly, responses to question 1 were used to organise participants into different suicidal groups (for further details see the 'Operationalisation of Suicidal Behaviour' section below). Thirdly, item 4 was used to develop a measure of suicide-related hopelessness (further information is provided in the previous 'Measuring Hopelessness' section).

The SBQ-R has been validated for use in clinical and non-clinical populations (Osman et al., 2001), as well as college and undergraduate students (Ammerman et al., 2015; Hirsch & Barton, 2011), and has consistently shown good reliability in identifying risk for future suicide attempts (Osman et al., 2001). It demonstrates good internal consistency ranging from moderately high (α=.88) for psychiatric adolescent inpatient sample, to adequate (α=.76) in a non-clinical undergraduate population (Osman et al., 2001). Details of the internal consistency of the scale in the current study are presented in table 3.5.

It has been reported that in some groups (e.g. autistic people) differences in interpretation of particular items may result in unreliable scores (Cassidy et al., 2020). However, the scale's ability to differentiate between varying levels of suicidal

behaviour combined with its ease of administration in an online survey was considered to support its use in the current study.

METHODS OF DATA COLLECTION (PROCEDURE)

Data collection Method

Responses to the questionnaire were collected through an online anonymous survey. Online surveys are a common technique for collecting quantitative data and this approach granted the current study three key benefits. Firstly, it was quick and easy to administer. Once the survey was available online, forwarding a link for participation was a simple process which demanded little in terms of time and cost resources to the researcher. Secondly, online participation helped ensure the survey reached as large a number as participants as possible. Thirdly, its flexibility provided convenience for participants. The survey's online availability meant that there was no requirement for participants to complete the survey at a specified time and respondents were able to pause participation and return at a later time if they wanted.

A recognised limitation of relying on online surveys as a method of data collection is incomplete or poor quality data arising from 'respondent fatigue' (Ben-Nun, 2011). This refers to the potential for participants to either abandon attempts to complete the questionnaire or neglect to answer accurately due to the effects of weariness or discomfort. The phenomenon is frequently encountered in online research (Marcell & Falls, 2001). The approach for mitigating against any potential effects of 'respondent fatigue' was two-fold. Firstly, to guard against fatigue, three measures were incorporated into the research design: (i) instruments were selected both for their validity but also their brevity to help ensure the questionnaire was as short as possible; (ii) as previously mentioned, the format of the questionnaire enabled participants to take a break or skip and return to particular sections if required; and (iii) participants were forewarned about the length of the survey and were advised how many sections

were to be completed through a constantly visible progress bar at the bottom of the screen.

As an additional safeguard against the effects of 'respondent fatigue', data collected was initially screened to identify and remove any responses where participants appeared to provide stereotyped answers (such as where the response selected to every question was the same – the data analysis section of this chapter provides further information about this process).

The second important strategy designed to help reduce participant discomfort and therefore encourage greater rates of response was to ensure that participation in the survey was anonymous. Previous research has consistently reported that participation in research about difficult or sensitive subjects such as general mental health or previous traumatic experiences (Biddle et al., 2013; Rivlin et al., 2012) does not result in distress for participants. Furthermore, Smith, Poindexter et al. (2010) found that participants did not suffer an increase in symptoms as a result of taking part in suicide-related research. However, in some participants, anxieties about the consequences of reporting suicidal experiences (such as admission for treatment) have been found to limit their disclosure of suicidal feelings (Blanchard & Farber, 2020). In contrast, providing an anonymous space in which people can share their experiences of suicidal behaviour has been found to be of therapeutic benefit to participants (Gibson et al., 2014). It was anticipated therefore that such an approach would reduce the potential for discomfort to arise in participants (Barack & English, 2002) and generate responses which were more reflective of the true feelings of participants (Rodham & Gavin, 2006).

Data Collection Procedure

Data collection followed a four-part procedure as outlined in table 3.6.

Table 3.6

Procedure for Collecting Data from Participants

Data Collection Phase	Detailed Steps Involved
1. Seeking approval to advertise study	▪ Desk review of appropriate third-party organisations and websites for advertising the study ▪ Permission obtained from third party organisations
2. Study Launched	▪ Study advertised on Social media (Twitter, Facebook), relevant web pages and Coventry University Student Participation Database
3. Participant Procedure	
- *Participant Information Sheet*	▪ Once a participant clicked the online link they were directed to the participant information sheet ▪ Participants were advised of the ability to download the information sheet for future reference ▪ The information sheet advised of the right to withdraw at any time and made participants aware of the format and structure of the survey
- *Providing Consent*	▪ After reading the information sheet, participants were required to click 'next' which directed them to the consent form ▪ The consent form involved ticking boxes to confirm a number of statements relating to taking part in, and understanding the study ▪ If the final box confirming that they wanted to take part was not clicked, the online study was not able to progress
- *Completing the survey*	▪ The online survey was split into separate sections. This enabled participants to be advised at the start of each section, how much progress they had made and how many sections were left to complete

	▪ Participants were pre-warned before accessing sections containing self-harm and suicide related questions and there was the ability to skip these questions if desired. Participants were unable to proceed if consent was not expressly granted at these stages
- *Debrief*	▪ The final part of the online survey included the participant debrief information. This informed participants of the purpose of the study and reminded them of the process required if they wished to withdraw from the study at any time. The debrief sheet was available for download if required for future reference
- *Further support*	▪ At the bottom of each page of the survey, participants were able to access a link to a document providing contact details for relevant support organisations
4. Data storage	▪ Completed surveys were stored online through the secure Qualtrics platform ▪ Data was downloaded from Qualtrics onto secure Coventry University servers

ETHICAL CONSIDERATIONS

Ethical debates about the moralities, legalities and risks of participation in suicide research can be complex. Contrasting views about the morality of suicidal acts drive differing methodological approaches to research studies (Mishara & Weisstub, 2005). For example, an ethical position driven by a moralist perspective (which prioritises the preservation of life above all else), may restrict a study's ability to recruit participants viewed as being at a high risk of suicide (Sisti & Joffe, 2018). The current study makes no moral value judgement on the morality of suicidal behaviours. Rather, it recognises suicidal acts as a behavioural response to a multifaceted set of inter- and intrapersonal circumstances. However, in line with most research and clinical practitioners, it supports the view that every effort should be made to prevent as many deaths by suicide as possible (Walter & Pridmore, 2012).

Ethical approval for this research was granted by Coventry University Ethics Committee following institutional ethics procedures. In addition, this research followed principles for ethical research set out by the BPS (BPS, 2009) which aim to ensure the dignity, well-being and rights of participants.

This section discusses the ethical issues associated with the current study. It is structured into three subsections, each of which includes strategies for ensuring the fundamental principle of respect for participants was upheld (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research , 1979). The first includes details of the processes employed to maintain informed consent. The second concerns minimising harm to participants, and the third part considers privacy and confidentiality matters.

Informed Consent

Informed consent refers to the availability of information provided to participants so that their decision to take part is based on a full understanding of the research and implications of participation (Oquendo et al., 2004). This study's research design involved no requirement to withhold information from participants. The key consideration in respect of informed consent, was not therefore the provision of information to participants, but whether this information was sufficiently accessible to be understood by all those taking part.

There were two aspects to ensuring that participants were able to provide informed consent. Firstly, the study sample was drawn from the general population which therefore avoided clinical inpatient populations and helped ensure that participants were less likely to be experiencing current severe mental health difficulties which may impact on their capacity to provide informed consent. However, the sample was heavily weighted towards those with experience of suicidal behaviours; current and previous mental health difficulties, and developmental conditions. The study therefore employed specific safeguards to ensure that participants were able to understand the information provided and make an informed choice about participation.

To help overcome any difficulties with comprehension of materials, information was provided in multiple formats. Participants were able to download and print the Participant Information Sheet (Appendix 2) to ensure they took sufficient time to understand the information and so that they could refer to it again in the future if required. Researcher contact details were also provided so that participants could pursue clarification or further information in a verbal format. Participants were also clearly informed that participation was entirely voluntary and that they could withdraw from the study at any time.

Secondly, the online nature of the study meant that there was no opportunity to directly ensure the extent of understanding of each participant. This was mitigated through repeated requirements for participants to confirm their understanding. To reduce the effect of routine clicking without reading terms (Obar & Oeldorf-Hirsch, 2016), participants were required to select an 'agree' option every time information was presented, before the survey would continue. There were also reminders at the start of each section of the online survey about the following content which required active confirmation before the survey progressed.

Avoidance of Harm to Participants

The current study included participants vulnerable to an increased risk of suicidal behaviour. As the research posed no explicit therapeutic benefit to participants, it was important to fully justify the study and its impact on those taking part. Two potential benefits resulting from the study were identified. Firstly, the overall aim was to investigate the IPTS model as a mechanism for explaining suicidal behaviour. Despite a growing body of research about suicide, our ability to predict who is most at risk of suicidal behaviours (and therefore most in need of clinical intervention) is limited (Franklin et al., 2016). Findings which improve our understanding of suicidal risk would therefore refine future research directions and improve clinical assessment and treatment of those most at risk.

Secondly, in line with previous research, it was hoped that those taking part may value the opportunity to share their experiences (Blades et al., 2018). In particular, it has been reported that participants taking part in online suicide research anonymously may experience therapeutic benefits (Biddle et al., 2013; Gibson et al., 2014).

Despite the potential benefits of the study, it was also important to employ strategies aimed at minimising any possible harm to participants. The first of these related to managing the risk of suicidal behaviour resulting from participation. As previously noted, extant literature suggests that taking part in suicide research does not increase the likelihood of suicidal behaviour occurring (Biddle et al., 2013; Gibson et al., 2014). However, as an additional safeguard against increasing suicidal risk, the current study included a link on each page of the survey to details of organisations available to those seeking further support. In addition, participants were informed that if they contacted the researchers outside of the online study forum and disclosed information which indicated that they were at risk of harm, the relevant authorities would be informed.

The second mechanism was aimed at reducing the risk of harm experienced through any discomfort and distress which may occur as a result of participating in the survey. Steps to address this included providing information at the start of each section informing participants of the nature of the questions in the following section. This promoted individual control as individuals were able to skip either particular questions or the entire section if they wished. The online survey also contained numerous links to an external document which detailed contacts for support organisations. Participants were able to access weblinks directly to external support or were able to print off or save the document for further reference. In the event that participants experienced distress, they were supported by contact details for external organisations.

Privacy and Confidentiality

In research terms, maintaining a right to privacy involves ensuring that: (i) information about participants is not exposed to others; (ii) participants have control over the information they disclose; and (iii) that only information pertinent to the topic of study is revealed (Kelman, 1977). In relation to part (i), the current study protected the

privacy of those taking part through ensuring confidentiality in line with the BPS Code of Ethics (2009). As responses to the online survey were anonymised and no identifiable data was collected it was not possible to attribute any information to specific individuals.

In relation to part (ii), participation was voluntary, and participants were regularly reminded about their right to withdraw or skip sections if they wished. This helped ensure that individuals could freely choose whether or not to disclose specific types of information. In relation to part (iii), the survey only collected data relevant to the achieving the study's overall aims and objectives.

Although online participation enabled anonymity and confidentially to be maintained, there was the facility for participants to make contact with researchers outside of the survey environment. Consistent with BPS guidelines (2009), participants were informed that any such contact made with researchers where a risk of harm to self or others may be disclosed or where a criminal act may have or may be about to take place (such as in the case of assisting someone to take their own life), would not be able to be subject to the confidentiality assurances.

METHODS OF DATA ANALYSIS

This section details the statistical methods employed to analyse the data and produce findings. It contains information about: the analytical software used; methods for screening and preparing the data for analysis; the operationalisation of key variables in the study; scale reliability, and the data analytic strategy followed for each research question.

Data Analysis Software

The SPSS version 24 software package was used to carry out the statistical analysis for each research question. An additional computational tool known as the PROCESS

macro add-on was employed to facilitate the calculation of path analysis-based mediation analysis for questions 3-6 (Hayes, 2018).

Data Screening

Data screening was an important part of ensuring that data used in the study demonstrated the required reliability and validity to perform the selected statistical analyses. Three key steps were involved. The first was to evaluate the quality of the responses. This was done through: (i) inspecting the time taken by each participant to complete the questionnaire to identify instances where participants may have activated any response to each item in an attempt to complete the survey as quickly as possible; (ii) identifying the percentage of the questionnaire completed by each participant, and (iii) ensuring that responses contained data relating to the key predictor and outcome variable included in the study.

Of the total N=330 participants, 68 had completed less than 50% of the questions (*M*=10%, *SD*=3%), and they had taken less than 10 minutes to complete the survey (M_{time}=3mins, *SD* time = 1 min). In addition, N=8 participants failed to answer any questions relating to key measures. Therefore, as a result of the initial filtering process, N=76 participants were removed, leaving a sample of N=254 as the final dataset to be used in the current study.

The second step of the data screening process involved checking for errors. A series of analyses using descriptive statistics were performed on both categorical and continuous variables to ensure that there was no miscoding and that all values fell within the range of possible values for each variable.

The final step involved using box plots to test for outliers that might significantly impact on the accuracy of the analytic procedures (e.g. linear regression). This revealed no concerns.

Data Organisation and Manipulation

Once data was adequately screened, it was necessary to prepare the data for statistical analysis. This involved three aspects. The first step related to checking for missing data. Table 3.7 presents a summary of the missing data analysis. It can be seen from table 3.7 that there were full response rates for 12 of the 14 key variables. There were missing data in respect of two variables: (i) the total score of the ACSS, and (ii) the 'I could kill myself if I wanted to' item of the ACSS. This meant that the total size of the sample for questions relating to acquired capability was reduced from N=254 to N=209.

Table 3.7

Summary of Missing Data Analysis

Variable	Number of responses (N)	Mean	SD	Number of missing responses
Age	254	25.23	9.649	0
Sex	254			0
Relationship Status	254			0
Self-Harm Experience	254			0
Depression (HADS)	254	6.252	4.387	0
Anxiety (HADS)	254	9.772	4.613	0
TB (INQ-10)	254	18.886	8.036	0
PB (INQ-10)	254	12.681	8.642	0
Previous SB (SBQ-R Item 1)	254	2.940	1.686	0
Frequency of SB (SBQ-R Item 2)	254	2.510	1.408	0
Threat of SB (SBQ-R Item 3)	254	1.780	1.312	0
Future likelihood of SB (SBQ-R Item 4)	254	2.530	1.723	0
ACSS total score	209	57.407	11.367	45
ACSS item ('I could kill myself')	236	2.370	1.434	18

Note. HADS=Hospital Anxiety and Depression Scale; TB=Thwarted Belongingness; PB=Perceived Burdensomeness; INQ-10=Interpersonal Needs Questionnaire-10; SB=Suicidal Behaviour; SBQ-R=Suicide Behavior Questionnaire-Revised; ACSS=Acquired Capability for Suicide Scale.

The second step was to assess the normality of the data distribution. A Shapiro-Wilk test revealed that the data was not normally distributed: z(skew)=.751, $p \leq .01$ and z(kurtosis)=-3.615, $p \leq .01$. Box plots showed that there were no outliers to be concerned about. Given the positively skewed nature of the data, a square root transformation was performed which resulted in a reduction of skew (=.441) and kurtosis (=-1.027). After log 10 transformation, data was distributed more normally with skewness (=.125) and kurtosis (=1.22) values within the established acceptable parameters of -1 to +1 (Field, 2013). Bootstrapping set as 10,000 samples was also used for all mediational calculations.

Operationalising Suicidal Behaviour

Suicidal behaviour was intended to reflect the progressive degrees of risk set out within the IPTS framework to describe suicidal acts. This section describes the theoretical basis for the current study's approach to operationalising three levels of suicidal behaviour.

The IPTS theory uses the umbrella term 'Suicidal Behaviour' to describe any self-initiated action, in terms of thoughts, plans, communications or behaviours, that are potentially injurious, which occur in the presence or absence of actual physical injury, and the presence or absence of an intent to die (Silverman et al., 2007). The IPTS also argues that we need to move away from understanding suicidal behaviour as a broad unitary construct, and instead, develop taxonomies that can differentiate those who think about suicide from those who plan, and from those who go on to attempt to kill themselves. However, it is not sufficient to understand suicide as a categorical construct, which treats ideations, plans and attempts as discrete events. The theory also needs to recognise suicidal behaviour as a potentially continuous process in which each dimension is understood as a progressive set of overlapping stepping stones representing degrees of suicidal severity.

Consistent with this premise, the IPTS model proposes that the aetiology of suicide can be understood in three principal phases. The first starts when people experience 'passive suicidal ideations', which are defined as occasional thoughts that take a person away from normal cognitive functioning towards ideas such as: 'I wish I was dead' or 'I would be better off dead'. Such actions may constitute a marginal increase in the degree of risk if they are also accompanied by occasional passive thoughts about how they might achieve this possibility. The second consists of 'active suicidal thoughts' which move beyond the passive phase towards firmly established thoughts such as: 'I really want to kill myself'; a state of mind where the desire to die is transformed into a real planned possibility. The third phase involves 'suicidal intent' a level of desire, which is accompanied by a reduced fear of death and an increase tolerance of pain, that translates suicidal desire into actual (potentially lethal) suicidal behaviour.

In operational terms, in order to reflect this continuum of suicidal behaviour, data obtained from Question 1 of the SBQ-R, which asks participants: 'Have you ever thought about or attempted to kill yourself?' will be used. Participants respond by indicating the most serious form of suicidal behaviour that they have carried out from one of six of the following options:

1) Never
2) It was just a brief passing thought
3) I have had a plan at least once to kill myself, but did not try to do it
4) I have had a plan at least once to kill myself and really wanted to die
5) I have attempted to kill myself but did not want to die
6) I have attempted to kill myself and really hoped to die.

Responses to this question were used in order to construct a survey experimental design. This was achieved by splitting the total dataset into three, meaningful, sample populations. These sample populations were designed to represent the different stages of the suicidal spectrum proposed by the IPTS model, and also reflect the need to understand suicidal behaviour as a continuous process. Table 3.8 provides a summary of the groups design.

Table 3.8

Summary of Survey-Experimental Groups Design

	Nevers	Thinkers	Planners (no intent)	Planners (with intent)	Attempters
Sample 1	✓	✓	✓		
Sample 2		✓	✓	✓	
Sample 3			✓	✓	✓

Note. Based on responses to item 1 of Suicidal Behavior Questionnaire-Revised (SBQ-R): Nevers=participants who responded as 'never'; Thinkers= participants who responded as 'it was just a brief passing thought'; Planners(no intent)= participants who responded as 'I have had a plan at least once to kill myself but did not try to do it'; Planners(with intent)= participants who responded as 'I have had a plan at least once to kill myself and really wanted to die'; Attempters= participants who responded with either 'I have attempted to kill myself, but did not want to die' or 'I have attempted to kill myself, and really hoped to die'.

It will be noted from table 3.8 that three samples were formed as follows:
Sample 1 was formed of: (i) '**nevers**' (those who claimed to have never engaged in suicidal behaviour); (ii) '**thinkers**' (those who claimed to have had passive suicidal ideations through experiencing brief passing thought about suicide), and (iii) '**passive planners'** (those who claimed to have made plans in the past, but had no wish/desire to carry them out). Overall, this group may be considered as including participants on a spectrum from having no intent to those who, according to the IPTS, may be viewed as engaging in **'passive suicidal ideations'.**

Sample 2 was formed of: (i) '**thinkers**' (those who claimed to have had passive suicidal ideations through experiencing brief passing thought about suicide); (ii) **passive planners'** (those who claimed to have made plans in the past, but had no wish/desire to carry them out), and (iii) '**active planners' (**those who claimed to have made plans in the past and really wished/desired to die). It can be noted that the difference between sample 1 and sample 2 is that the former focuses on a progressive flow towards 'passive ideations' while sample 2 focuses on the continuation of this progressive process towards 'active thoughts'. Overall, this group may be considered

as including participants on a spectrum from those with passive ideas about death to those who, according to the IPTS, may be viewed as engaging in '**active suicidal thoughts'.**

Sample 3 was formed of: (i) '**passive planners'** (those who claimed to have made plans in the past, but had no wish/desire to carry them out); (ii) '**active planners' (**those who claimed to have made plans in the past and really wished/desired to die), and (iii) 'Attempters' (those who claimed to have actually attempted suicide with the intention of wanting to die). It will be noted that the difference between sample 2 and sample 3 is that the former focuses on a progressive flow towards 'active thoughts' while sample 3 focuses on the continuation of this progressive process towards suicidal 'Attempts'. Overall, this group may be considered as including participants on a spectrum from those with active thoughts about death to those who, according to the IPTS, may be viewed as engaging in **'potentially lethal suicidal attempts'.**

With regards to the **attempts** groups in sample 3, it should be noted that various differential tests (independent t-tests) were carried out between those who claimed to have attempted suicide, but did not want to die, and those who claimed to have attempted suicide, and hoped to die. No significant differences were found. As a result, the two 'attempts' values in question 1 of the SBQ were transformed so that the two sets of data on 'attempts' were recoded and merged under the same label.

Analytic Approach for Individual Research Questions

This section presents details about the analysis carried out for each of the six key research questions.

1. Do the IPTS Constructs (TB, PB and Hopelessness) Represent General Predictors of Mental Health Distress or are they Specific Predictors of Suicidal Risk? In order to test this question, results needed to be able to show:

a) whether the three IPTS constructs are more helpful at predicting specific suicidal thoughts than they are at predicting other general forms of mental distress such as: anxiety, depression and self-harm; and

b) whether the three IPTS constructs each make a significant contribution towards predicting suicidal thoughts; a pattern not held across other general forms of mental distress.

Linear and simple logistical regression models were used to statistically test part (a) of question 1 above. The IVs added to the regression models were the 3 IPTS constructs (TB, PB and Hopelessness).

Four regression analyses were performed using separate DVs representing each of the three different forms of mental health distress (anxiety, depression and self-harm), and a fourth DV representing suicidal risk.

If the IPTS constructs are more helpful at predicting suicidal thoughts then we would expect the level of overall variance $\mathbf{R^2}$ to be greater for the suicidal risk DV than for depression, anxiety and self-harm.

The data provided from these regression models was also used in order to address part (b) of question 1 above. Here, the standardised β values and significance levels were compared to examine the relative contribution that the three constructs make toward each of the various forms of psychological distress.

2. Do the IPTS Constructs (TB, PB and H) Remain Important Predictors of Risk when Compared with the more Traditional, Well Established Epidemiological (Age, Sex and Relationship Status) and Psychopathological (Depression and Anxiety) Risk Factors Already known to Influence Suicidal Behaviour? In order to test this question, results needed to be able to show:

a) Whether established epidemological factors (sex, age and relationship status) are important to predicting suicidal risk;
b) whether established psychopathological factors (depression and anxiety) are important to predicting suicidal risk, after established epidemiological factors (age, sex and relationship status) have been controlled/accounted for;
c) whether the new IPTS constructs (TB, PB and H) are important to predicting suicidal risk, after established epidemiological and psychopathological factors have been controlled/accounted for.

Hierarchical multiple regression provides a framework for organising variables into blocks through which their individual and combined influence on the outcome variable may be understood. This technique was therefore used to examine each of the points (a), (b) and (c) above. The independent variables were categorised into three blocks. Block one included socio-demographic risk factors (age, sex and relationship status). Block two included mental health related risk factors (depression and anxiety). Block three included the IPTS constructs (TB, PB and hopelessness). The DV was suicide risk (measured using responses to items 1-3 of SBQ-R).

The analysis was carried out across the population sample as a whole (N=254). For this analysis, a significance level of $p \leq .01$ was assumed to reduce the likelihood of identifying type 1, false effect errors.

Results produced an R^2 figure which tells us how much variance in suicide risk is explained by the addition of variables at each step of the analysis. If the IPTS constructs are more helpful at predicting suicidal risk than either socio-demographic characteristics (block one) or mental health risk factors (block two), then we would expect the level of overall variance R^2 explained by the addition of the IPTS variables in block three to be greater than the variance R^2 explained by the model in blocks one and two. The results also produced the significance levels of each variable at each stage of the regression analysis. If the IPTS variables are better at predicting suicide risk, we would expect that any level of significance demonstrated by the traditionally established risk factors within blocks one or two of the analysis would reduce in block three when the IPTS variables are included.

3. Do the IPTS Constructs (TB and PB) Function as Proximal Risk Factors (Mediators) Between Depression and Suicidal Behaviour? The IPTS states that TB and PB are proximal risk factors in the development of suicidal behaviours. In order to test this question, results needed to be able to show:

a) whether TB or PB mediate the causal relationship between depression and passive suicidal ideations;

b) whether TB or PB mediate the causal relationship between depression and active suicidal thoughts;

c) whether TB or PB mediate the causal relationship between depression and potentially lethal suicidal attempts.

As discussed in Chapter 2, the current study operationalised TB, PB and hopelessness as mediators in the relationship between depression and suicidal behaviour. Research questions 3, 4 and 5 each aim to understand the causal relationships between multiple mediators (TB, PB and hopelessness) and variables (depression and three levels of suicidal behaviour).

Mediational analysis is often used to understand how one variable may influence the relationship between two other variables (Barker et al., 2012). Traditional approaches to mediation (see for instance Baron & Kenny, 1986) follow a causal steps sequence whereby the relationships between each of the variables is tested to determine whether there is a mediation effect. This method relies on estimates and assumptions to test the effect of the indirect paths between variables (Hayes, 2018). More recent methods (such as sequential mediational analysis) quantify the indirect and direct relationships between the variables and mediators and provide a more sophisticated way of understanding the underlying causal mechanisms between variables (Hayes, 2018).

Sequential mediational analysis was therefore employed to analyse both the effect of each mediator on the relationship between depression and suicidal behaviour, as well as any sequential ordering of the mediators. The choice of this model of analysis facilitated a simple and clinically useful means of understanding the impact of the multiple IPTS constructs on the relationship between depression and different levels of suicidal behaviour.

The analysis for research question 3 was calculated using model number 6 of the PROCESS computational tool for path-analysis based mediation (Hayes, 2018). This model was used to analyse the relationship between depression and suicidal behaviour and the effect (if any) of two mediators (TB and PB).

In these analyses the independent variable (X) was depression; the dependent variable (Y) was the degree of suicidal behaviour, and the mediating variables were TB and PB. The analysis was performed three times across each of three levels of suicidal behaviour (passive suicidal ideation; active suicidal thoughts and potentially lethal suicidal attempts).

For this analysis, a significance level of $p \leq .01$ was assumed. Given the nature of the model (mediational) and the relatively large sample size, a higher threshold for significance was used to reduce the chances of the analysis revealing seemingly significant findings which could make the results difficult to interpret (Type 1 errors). Findings from this question are presented in figures 1a to 1c which provide path model illustrations of the results for each of the samples.

Information from path (a) on figures 4.1 to 4.3 tells us about the relationship between depression and TB. Path (b) describes the relationship between either TB or PB and suicidal behaviour. Paths (C) and (c') provide an indication of the direct relationship between depression and suicidal behaviour before and after the mediating variables have been taken into account.

If TB and PB act as more direct, proximal risk factors in the relationship between depression and suicidal behaviour, we would expect any relationship between depression and suicidal behaviour to not hold once the variables of TB and PB are considered because they will have an indirect, mediation effect.

4. Are the IPTS Constructs (TB and PB) Related to Each Other? As discussed in Chapter 2, most previous literature operationalises the relationship between TB and PB as a statistical interaction effect. However, the IPTS characterises TB and PB as proximal risk factors in a wider causal relationship between depression and suicidal behaviour. Therefore, in order to test the question about the relationship between TB and PB in the context of their influence on any relationship between depression and suicidal behaviour, results from the current study needed to be able to show:

a) whether a sequential path between TB and PB mediates the causal relationship between depression and passive suicidal ideations;

b) whether a sequential path between TB and PB mediates the causal relationship between depression and active suicidal thoughts;

c) whether a sequential path between TB and PB mediate the causal relationship between depression and potentially lethal suicidal attempts.

Sequential mediational analysis (for further discussion of this choice of model see previous question 3) was therefore performed using PROCESS model number 6 (Hayes, 2018). This analysis calculated the relationship between TB and PB and its effect on the association between depression and suicidal behaviour.

In this analysis the independent variable (X) was depression; the dependent variable (Y) was the degree of suicidal behaviour, and the mediating variables were TB and PB. The analysis was performed three times across each of the three different sample populations of suicidal behaviour (passive suicidal ideation; active suicidal thoughts and potentially lethal suicidal attempts).

For this analysis, a significance level of $p \leq .01$ was assumed to reduce the likelihood of identifying type 1, false effect errors. Findings from this question are presented in figures 1a to 1c which provide path models illustrations of the results for each of the samples. Information from path (d1) on figures 4.1 to 4.3 tells us about the relationship between TB and PB.

5. Does Hopelessness Mediate the Relationship between TB and PB? The theoretical role of hopelessness within the IPTS is unclear (see Chapter 1 for a full discussion). As discussed in Chapter 2, many empirical studies operationalise hopelessness as a moderating influence on the IPTS constructs. However, the current study aims to understand the role of hopelessness in the context of a causal relationship between depression and suicidal behaviour, and in particular, whether hopelessness mediates the relationship between TB and PB. In order to test this question, results needed to be able to show:

a) whether a sequential path between TB and H and PB mediates the causal relationship between depression and passive suicidal ideations;

b) whether a sequential path between TB and H and PB mediates the causal relationship between depression and active suicidal thoughts;

c) whether a sequential path between TB and H and PB mediates the causal relationship between depression and potentially lethal suicidal attempts.

Sequential mediational analysis (for further discussion of this choice of model see previous question 3) was therefore performed using PROCESS model number 6 (Hayes, 2018). This model was used to analyse the relationship between depression and suicidal behaviour and the effect (if any) of three mediators (TB, Hopelessness and PB).

In these analyses the independent variable (X) was depression; the dependent variable (Y) was the degree of suicidal behaviour, and the mediating variables were TB, hopelessness and PB. The analysis was performed three times across each of three levels of suicidal behaviour (passive suicidal ideation; active suicidal thoughts and potentially lethal suicidal attempts).

For this analysis, a significance level of $p \leq .01$ was assumed to reduce the likelihood of identifying type 1, false effect errors. Findings from this question are presented in figures 1a to 1c which provide path model illustrations of the results for each of the samples.

Information from path (a) on figures 4.1 to 4.3 tells us about the relationship between depression and TB. Path (b) describes the relationship between either TB or PB and suicidal behaviour. Paths (C) and (c') provide an indication of the direct relationship between depression and suicidal behaviour before and after the mediating variables have been taken into account. Paths (d1) and (d2) describe the relationship between TB and hopelessness and hopelessness and PB respectively.

6. Does the IPTS Construct of AC help Predict Suicide Attempts? In order to test this question, results needed to be able to show:

a) whether AC is related to suicide risk;
b) whether AC mediates the causal relationship between depression and passive suicidal ideations;
c) whether AC mediates the relationship between depression and active suicidal thoughts;
d) whether AC mediates the causal relationship between depression and potentially lethal suicide attempts.

In respect of part (a), correlational analysis was used to calculate the association between each item of the ACSS-20 and total suicide risk. For this analysis, in order to further reduce the likelihood of detecting a false effect, a significance level of $p \leq .0005$ was used.

In respect of parts (b), (c) and (d), parallel multiple mediational analysis was calculated. Parallel mediational analysis considers the individual effect of multiple mediators on the relationship between an independent (X) and dependent (Y) variable (Hayes, 2018). A fundamental premise of this model is that none of the mediators are known to causally influence each other. The overall aim of this research question was to understand which individual aspects of AC were most pertinent to the development of suicidal behaviour. This model was therefore used to analyse the relationship between depression and suicidal behaviour and the effect (if any) of eight mediators (items of the ACSS-20 which demonstrated a significant association with total suicidal risk in part (a)).

In these analyses the independent variable (X) was depression; the dependent variable (Y) was the degree of suicidal behaviour, and the mediating variables were: (i) The things that scare most people do not scare me; (ii) I can tolerate a lot more pain than most people; (iii) People describe me as fearless; (iv) I could kill myself if I wanted to; (v) The fact that I am going to die does not bother me; (vi) I am not afraid to die; (vii) I am very much afraid to die, and (viii) The sight of blood bothers me a great deal. The

analysis was performed three times across each of three levels of suicidal behaviour (passive suicidal ideation; active suicidal thoughts and potentially lethal suicidal attempts). For this analysis, a significance level of $p \leq .01$ was assumed to reduce the likelihood of identifying type 1, false effect errors.

Findings from this question are presented in figures 4.4 to 4.6. Information from the a-paths (a1 – a8) tells us about the relationship between depression and each of the ACSS items. Information from the b-paths (b1-b8) describes the relationship between each of the ACSS items and each level of suicidal behaviour. Paths (C) and (c') provide an indication of the direct relationship between depression and suicidal behaviour before and after the mediating variables have been taken into account.

CONCLUSION

This chapter has provided information about the methods used within the current study to: guide the selection of an appropriate research approach and design; develop a sample of participants; measure and operationalise variables pertinent to investigating the research questions; collect and analyse relevant data in line with the aims of this project, and consider the ethical implications of the study.

The processes and procedures described in this chapter were used to form a research study – the results of which are presented in the next chapter.

CHAPTER 4

RESULTS

This research project started by evaluating the theoretical foundations underlying the IPTS framework (see Chapter 1). Chapter 2 systematically reviewed empirical research measuring the contribution each of the main pillars of the IPTS model make to understanding suicidal behaviour. Following a critical assessment of this previous theoretical and evidence-based research (for a review see sections 4 of chapters 1 and 2), six conceptual difficulties underlying the logical integrity of the IPTS model were highlighted which, to date, have not been fully evaluated. These conceptual difficulties represent very specific limitations underlying the IPTS framework (its specificity) and need to be more thoroughly researched before we can make a judgement on the relative merits of the IPTS model as representing a meaningful approach to better understanding why people sometimes make the decision to end their own lives.

The results presented in this chapter address each of these six principal difficulties which have been operationalised (see Chapter 3) into the following six research questions:

1) Do the IPTS constructs (TB, PB and hopelessness) represent general predictors of mental health distress or are they specific predictors of suicidal risk?

2) Do the IPTS constructs (TB, PB and hopelessness) remain important predictors of risk when compared with the more traditional, well established epidemiological (age, sex, and relationship status) and psychopathological (depression and anxiety) risk factors already known to influence suicidal behaviour?

3) Do the IPTS constructs (TB and PB) function as proximal risk factors (mediators) between depression and suicidal behaviour?

4) Are the IPTS constructs (TB and PB) related to each other?

5) Does hopelessness mediate the relationship between TB and PB?

6) Does the IPTS construct of AC help predict suicide attempts?

In order to help ensure that the chapter's findings follow a logical and progressive set of ideas, each question will be explored in terms of: (i) the context under which the question emerged; and (ii) a detailed presentation and interpretation of the most salient results.

QUESTION 1: DO THE IPTS CONSTRUCTS (TB, PB AND HOPELESSNESS) REPRESENT GENERAL PREDICTORS OF MENTAL HEALTH DISTRESS OR ARE THEY SPECIFIC PREDICTORS OF SUICIDAL RISK?

Question 1: Context

According to the IPTS model, three principal theoretical constructs (TB, PB and hopelessness) are helpful in predicting the risk of suicidal ideations. However, the theory also suggests that these constructs may be causally related to a range of other psychological difficulties such as depression, anxiety and self-harming behaviour. As a consequence, the IPTS model cannot conclude, with any degree of certainty, whether the state of mind generated by experiencing TB, PB, and hopelessness actually helps predict the development or presence of suicidal thoughts. Conversely, it might be the case that these constructs only have a limited direct causal effect on suicidal behaviour and are instead indicative of a more generalised state of mental health distress. In order to clarify the IPTS claim, we would expect to find:

a) that the three IPTS constructs (TB, PB and hopelessness) are more helpful at predicting suicidal risk than they are at predicting other general forms of mental distress such as: anxiety, depression and self-harm;

b) that the three IPTS constructs (TB, PB and hopelessness) collectively make a significant contribution towards predicting suicidal risk rather than other general forms of mental distress such as depression, anxiety and self-harm.

Table 4.1.

Summary of Linear Regression Analyses[a] Explaining Role of TB, PB and Hopelessness in Predicting Depression, Anxiety, Self-Harm and Suicidal Risk

	Depression					Anxiety					Self-Harm					Suicidal Risk				
			95% CI					95% CI					95 % CI					95% CI		
	β	SE	LL	UL	p	β	SE	LL	UL	p	β	SE	LL	UL	p	β	SE	LL	UL	p
R^2			.456*					.345*					.250*					.715*		
TB	.468	.037	.182	.329	.000*	.445	.043	.171	.340	.000*	.922	.027			.003*	.212	.001	.003	.009	.000*
PB	.154	.035	.009	.148	.028	.162	.041	.006	.167	.035	1.036	.026			.172	.160	.001	.002	.007	.002*
H	.123	.169	-.020	.647	.066	.028	.195	-.310	.460	.701	.564	.130			.000*	.568	.007	.065	.091	.000*

Note. Total N=254. β=standardised coefficient; CI=Confidence Interval; LL= Lower Limit; UL=Upper Limit; TB= Thwarted Belonging; PB= Perceived Burdensomeness; H= Hopelessness.

[a]: Data for self-harm was obtained using logistical regression

**p≤.001*

Question 1: Results

a) Are the Three IPTS Constructs (TB, PB And Hopelessness) more Helpful at Predicting Suicidal Risk than they are at Predicting Other General Forms of Mental Distress such as Depression, Anxiety and Self-Harm? Table 4.1 presents a summary of the results obtained from four regression models calculated separately across four dependent variables (Row 1) – depression, anxiety and self-harm (representing forms of mental health distress), and suicidal risk. The independent variables (Column 1) added to each of the four regression models were the three IPTS constructs: TB, PB and hopelessness (H). If these constructs are more helpful at predicting suicidal thoughts than general states of mental health distress, then we would expect the percentage of overall variance (R^2 ;Row 2) to be higher for suicidal risk than for depression, anxiety or self-harm. It will be noted from the R^2 value in the first model of table 4.1, that the three IPTS constructs (TB, PB and H) ; accounted for 46% (R^2=.456, F(3, 250)=69.89, $p\leq$.001) of the variance in depression. In terms of the second model (which relates to anxiety), the IPTS variables combined explained 35% (R^2=.345, F(3, 250)=43.98, $p\leq$.001) of the variance. In the third model, 25% of the variance in self-harm was explained by the three IPTS constructs (R^2=.251, F(3, 250)=69.89, $p\leq$.001). And, finally, in the fourth model, 72% of the variance in suicide risk was accounted for by the three IPTS constructs (R^2=.715 F(3, 250)=209.487, $p\leq$.001).

Thus, evidence from the R^2 values seems to suggest that the three IPTS constructs (TB, PB and H) are more helpful at predicting suicidal risk than they are at predicting other general forms of mental distress.

b) Do the Three IPTS Constructs (TB, PB and H) Collectively make a Significant Contribution Towards Predicting Suicidal Risk Rather Than Other General Forms of Mental Distress such as Depression, Anxiety and Self-Harm? For each of the four regression models, table 4.1 sets out the standardised beta coefficients, the 95% confidence intervals associated with these beta coefficients, and their significance values. It will be noted from this data that with regards to the model predicting

depression, TB was significant (β=.468, SE=.037, $p \leq .001$) while neither PB (β=.154, SE=.035, $p \leq .028$) or H (β=.123, SE=.169, $p \leq .066$) achieved significant results.

The data from model 2 showed that there was a significant association between TB and anxiety (β=.445, SE=.043, $p \leq .001$) but not for PB (β=.162, SE=.041, $p \leq .035$) or H (β=.028, SE=.195, $p \leq .701$).

With regards to model 3, it will be noted that both TB (β=.922, SE=.027, $p=.003$) and H (β=.564, SE=.130, $p \leq .001$) were significantly related to self-harm, while PB was not (β=1.036, SE=.026, p=.172).

Data from the fourth model, reported in the final column of table 4.1, shows that all three IPTS variables: TB (β=.212, SE=.001, $p \leq .001$), PB (β=.160, SE=.001, $p=.002$) and H (β=.568, SE=.007, $p \leq .001$) were significantly associated with suicidal risk.

Thus, the evidence seems to suggest that that while TB represents an important risk indicator across general forms of psychological difficulties, the influence of all three IPTS constructs (TB, PB and H) only appears to be evident with regards to the specific risk of suicidal behaviour.

Overall, in terms of attempting to answer the question as to whether the IPTS constructs (TB, PB and H) represent general predictors of mental health distress or specific predictors of suicidal risk, the evidence seems to suggest that all three variables: 1) collectively explain more of the variance in suicide risk relative to other prominent mental health conditions; and 2) make a significant unique contribution towards explaining suicidal risk. Thus, while TB appears to be an important risk indicator across general psychological difficulties, the IPTS model, including TB, PB and H seems to represent the basis of a specific explanatory framework accounting for some the key causal risk factors underlying suicidal risk.

QUESTION 2: DO THE IPTS CONSTRUCTS (TB, PB AND H) REMAIN IMPORTANT PREDICTORS OF RISK WHEN COMPARED WITH THE MORE TRADITIONAL, WELL ESTABLISHED EPIDEMIOLOGICAL (AGE, SEX, AND RELATIONSHIP STATUS) AND PSYCHOPATHOLOGICAL (DEPRESSION AND ANXIETY) RISK FACTORS ALREADY KNOWN TO INFLUENCE SUICIDAL BEHAVIOUR?

Question 2: Context

Question 1 confirmed that the three IPTS constructs (TB, PB and H) represent specific predictors of suicide risk rather than more general indicators of mental health distress. However, existing research literature has already identified a series of factors known to increase the risk of suicide. These well-established risk factors include socio-demographic characteristics (such as age, sex and relationship status) and psychopathological presentations, particularly depression and anxiety. The IPTS model proposes that both the established risk factors and the newer IPTS constructs are important to understanding the development of suicidal behaviour. However, the importance of one set of risk predictors relative to the other has rarely been directly tested. As such, it is not possible to claim, with any degree of certainty, that the IPTS constructs continue to play an important role in suicide risk prediction after factors such as age, sex, relationship status, depression and anxiety have been accounted for. In order to show that the IPTS constructs maintain a prominent role in suicidal risk prediction, we would expect to find:

a) that established epidemological factors (age, sex and relationship status) are important to predicting suicidal risk;

b) that established psychopathological factors (depression and anxiety) are important to predicting suicidal risk, after established epidemiological factors (sex, age and relationship status) have been controlled/accounted for;

c) that the new IPTS constructs (TB, PB and H) are important to predicting suicidal risk, after established epidemiological and psychopathological factors have been controlled/accounted for.

Question 2: Results

a) Are Established Epidemiological Factors (Sex, Age and Relationship Status) Important in Predicting Suicidal Risk? Table 4.2 presents the results from a hierarchical multiple regression analysis in which eight independent variables were regressed onto a dependent variable, suicide risk. Column 1 of table 4.2 shows that the eight independent variables were organised into three blocks and then sequentially entered into the equation in the following order: (i) Block 1 socio-demographic factors (age, sex and relationship status); (ii) Block 2 psychopathological factors (depression and anxiety); and (iii) Block 3 the IPTS constructs (TP, PB, and H). Each block is then statistically assessed in terms of how much variance it helps explain in the dependent variable (suicidal risk).

Block 1 of table 4.2 provides some indication of how important established socio-demographic factors (sex, age and relationship status) are to predicting suicidal risk. Here, it will be noted that all three variables acount for a total 14% (R^2=.135, F(3, 250)=12.956, $p\leq$.001) of the variance in suicide risk. Furthermore, the *p*-values suggest that this level of variance is more likely to be explained by both gender differences (β=.232, SE=.032, $p\leq$.001) and age (β=.268, SE=.001, $p\leq$.001), rather than relationship status, which was not significant (β=-.094, SE=.029, p=.121).

b) Are Established Psychopathological Factors (Depression and Anxiety) Important to Predicting Suicidal Risk, After Established Epidemiological Factors (Age, Sex and Relationship Status) have been Controlled for? Block 2 of Table 4.2 provides some indication of how important established psychophysiological factors (depression and anxiety) are to predicting suicidal risk, while controlling for the socio-demographic variables presented in Block 1. Here, it will be noted that five variables accounted for a total of 32% (R^2=.316, F(2, 248)=22.875, $p\leq$.001) of the variance in suicidal risk. This is a considerable rise from the 14% explained in Block 1. By looking at the *p*-values it will be noted that both depression (β=.301, SE=.004, $p\leq$.001) and anxiety (β=.186, SE=.004, $p\leq$.010) are significant, suggesting that they are important to predicting suicidal risk.

Table 4.2.

Summary of the Hierarchical Regression Model Analysing Suicide Risk

	R^2	ΔR^2	F	β	SE	t	p	95% CI	
								LL	UL
Block 1	**.135**		**12.956**				**.000***		
Sex				.232	.032	3.92	.000*	.063	.191
Age				.268	.001	4.412	.000*	.004	.010
Rel. status				-.094	.029	-1.557	.121	-.101	.012
Block 2	**.316**	**.181**	**22.875**				**.000***		
Sex				.150	.029	2.789	.006*	.024	.140
Age				.173	.001	3.108	.002*	.002	.007
Rel. status				-.031	.026	-.576	.565	-.066	.036
Depression				.301	.004	4.200	.000*	.009	.024
Anxiety				.186	.004	2.594	.010*	.002	.017
Block 3	**.727**	**.411**	**81.676**				**.000***		
Sex				.074	.019	2.136	.034	.003	.078
Age				.043	.001	1.190	.235	-.001	.003
Rel. status				.000	.016	-.013	.990	-.033	.032
Depression				-.102	.002	-2.005	.046	-.011	.000
Anxiety				.048	.003	1.035	.302	-.002	.007
TB				.224	.002	4.095	.000*	.003	.010
PB				.165	.001	3.233	.001*	.002	.007
H				.566	.007	11.693	.000*	.065	.091

*Note. Total N=254. All coefficients are taken from the third/final step in the analysis. ΔR^2 = change in R2; β=standardised coefficient; SE=Standard Error; CI=Confidence Interval; LL= Lower Limit; UL=Upper Limit; Rel status=relationship status; TB= Thwarted Belonging; PB= Perceived Burdensomeness; H= Hopelessness. * p≤.01.*

However, it would be misleading to suggest that these psychopathological variables fully explain this increase in variance between Blocks 1 and 2. Table 4.2 also shows that in Block 2, both sex (β=.150, SE=.029, $p \leq .006$) and age (β=.173, SE=.001, $p \leq .002$) remain significant and so continue to account for a proportion of the variance.

c) Are the IPTS Constructs (TB, PB and H) Important to Predicting Suicidal Risk, after Established Epidemiological and Psychopathological Factors have been Controlled for? The results in Block 3 of table 4.2 provide some indication of how important the IPTS constructs (TB, PB and H) are to predicting suicidal risk, while controlling for the socio-demographic variables presented in Block 1 and the psychopathological variables presented in Block 2. Here it will be noted that all the variables included in the regression equation accounted for a total of 73% (R^2=.727, F(3, 245)=81.676, $p \leq .001$) of the variance in suicide risk, a considerable rise from the 14% explained in Block 1 and the 32% explained in block 2. However, the *p*-values suggest that not all of these variables significantly contributed towards accounting for the increase in levels of variance between blocks 2 and 3. In fact, the data in Block 3 of table 4.2 shows that only the three IPTS constructs: TB (β=.224, SE=.002, $p \leq .001$), PB (β=.165,SE=.001, $p \leq .001$) and H (β=.566, SE=.007, $p \leq .001$) seem to have an important role in predicting suicidal risk. For completeness, it should also be noted that while both sex (β=.074, SE=.019, p=.034) and depression (β=-.102, SE=.002, p=.046) did not reach the level of significance set for this analysis ($p \leq .01$), these variables do seem to maintain a degree of explanatory importance.

Overall, in terms of attempting to answer the question as to whether the IPTS constructs (TB, PB and H) remain important predictors of risk when compared with established epidemiological and psychopathological risk factors, the evidence seems to suggest that: (i) sex, age, and depression are important to understanding the prediction of suicidal behaviour; (ii) inclusion of the three IPTS constructs (TB, PB and H) to the regression equation seems to significantly improve the explanatory potential of this risk prediction model; and (iii) these three constructs remain important even after controlling for many other well-established socio-demographic and psychophysiological factors.

On the basis of these results, it would seem reasonable to conclude that the three IPTS constructs (TB, PB and H) are important variables to be considered in the development of any predictive model of suicidal behaviour. However, the IPTS framework goes further and suggests that it should be possible to identify a particular causal pattern amongst these three principal constructs. This possibility will be addressed in questions 3, 4 and 5 below.

QUESTION 3: DO THE IPTS CONSTRUCTS (TB AND PB) FUNCTION AS PROXIMAL RISK FACTORS (MEDIATORS) BETWEEN DEPRESSION AND SUICIDAL BEHAVOUR?

Question 3: Context

As evidenced by the results from question 2 above, depression is an important risk factor in predictive models of suicidal behaviour. However, the IPTS framework suggests that the direct causal importance of depression is often over-stated and that the constructs of TB and PB may be more directly relevant to predicting suicidal risk. In particular, it is argued that forms of mental health distress, including depression, operate as distal (or background) causal factors only - suicidal people may be depressed but not all depressed people are suicidal – while interpersonal constructs, especially TB and PB, have a more proximal (or immediate) causal impact on suicidal outcomes. Thus, in terms of understanding the chain of causation within predictive models of suicidal behaviour, the IPTS approach suggests that its principal constructs (TB and PB) are likely to mediate the relationship between depression and suicidal behaviour. In other words, the IPTS asserts that while there may initially be a causal association between depression and suicide, this relationship is spurious and will no longer hold (or is likely to be considerably weakened) once the mediating (indirect influence) of TB and PB have been considered (see Chapter 1 for a fuller discussion of this issue). If this claim does in fact hold true, then we would expect to find:

a) that TB or PB mediate the causal relationship between depression and passive suicidal ideations;

b) that TB or PB mediate the causal relationship between depression and active suicidal thoughts;

c) that TB or PB mediate the causal relationship between depression and potentially lethal suicidal attempts.

Question 3: Results

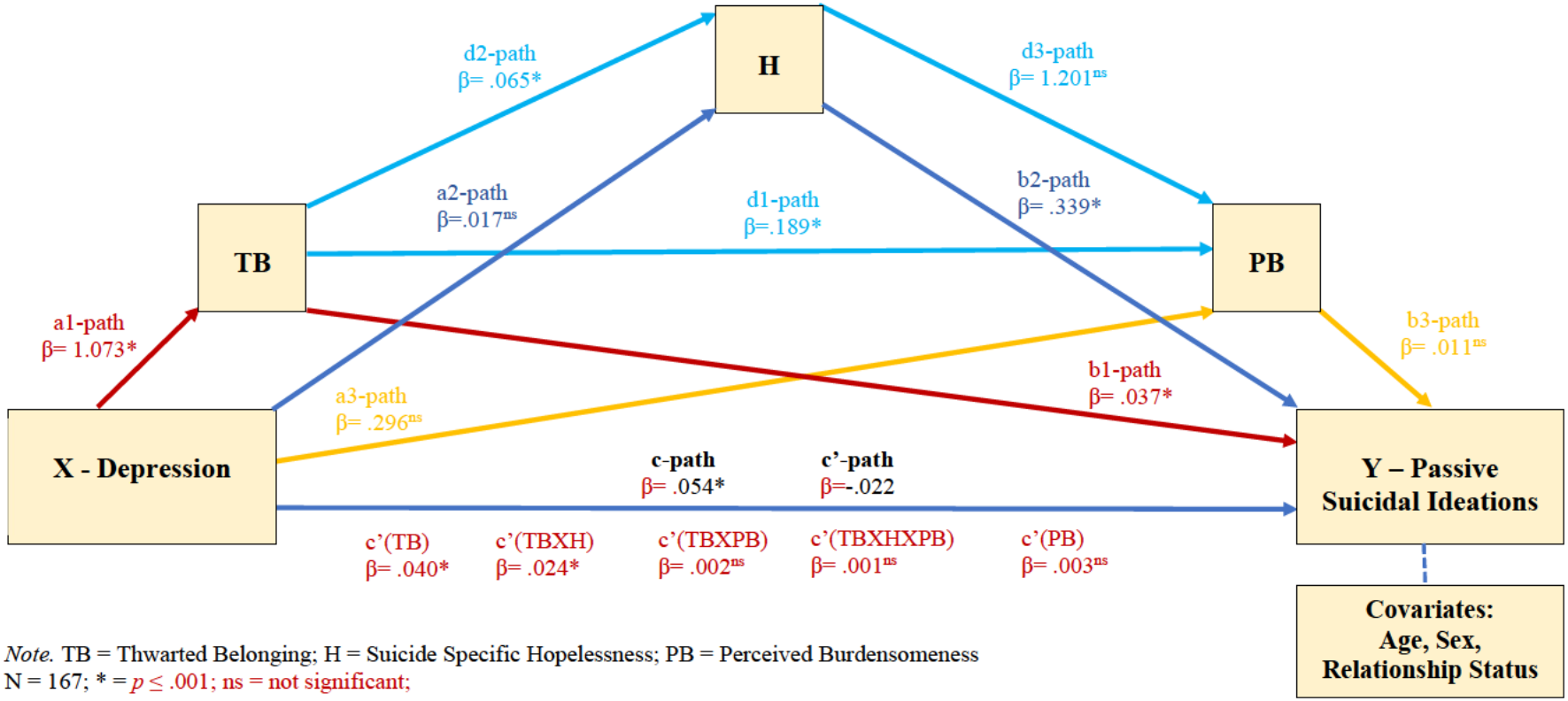
a) Does TB or PB mediate the causal relationship between Depression and Passive Suicidal Ideations? Figure 4.1 shows the path diagram for the sequential mediational analysis between depression (X) and passive suicidal ideations (Y) when age, sex and relationship status are included as covariates (see Chapter 3 for more information). The first result to note is that the regression of X on Y (the c-path), ignoring all mediators, is significant: β= .054, t(162) = 3.34, $p \leq .001$. Therefore, depression does seem to cause passive suicidal ideations.

In order to confirm whether this direct effect is eliminated or substantially reduced through the influence of other mediating variables, the total direct effect of X on Y (accounting for the influence of all mediators) should usually be non-significant. It will be noted from the results along the c' path that this has in fact been confirmed: β= -.022, t(159) = -1.32 p=.188.

The regression of depression (X) on the mediator TB (the a1-path) is significant (β= 1.073, t(162) = 9.076, $p \leq .001$), and the regression of the mediator (TB) on to passive suicidal ideations (Y) (the b1-path) is also significant - β= .037, t(159) = 3.855, $p \leq .001$. These results suggest that TB actually mediates the relationship between depression and passive suicidal ideations. However, in order to confirm this, it is important to establish whether the magnitude or indirect impact of the unique mediator TB is significant. This is in fact confirmed by the results - Indirect Effect c'(TB) = .040 (SE=.013), CI (95%) .019 to .066 – which shows that the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

Figure 4.1

Sequential Mediation Analysis for Relationships between Depression, Thwarted Belongingness, Perceived Burdensomeness, Hopelessness and Passive Suicidal Ideation (Sample 1)



Note. TB = Thwarted Belonging; H = Suicide Specific Hopelessness; PB = Perceived Burdensomeness
N = 167; * = $p \leq .001$; ns = not significant;

Direct Effect c (X-Y) =.054 (SE=.016), CI (95%) .022 to .086
Indirect Effect c'(X-Y) = -.022 (SE=.016), CI (95%) -.054 to .011
Indirect Effect c'(TB) = .040 (SE=.012), CI (95%) .019 to .066
Indirect Effect c'(PB) = .003 (SE=.004), CI (95%) -.005 to .011

Indirect Effect c'(TB, PB) = .002 (SE=.003), CI(95%) -.0035 to .009
Indirect Effect c'(TB, H) = .024 (SE=.007), CI(95%) .013 to .038
Indirect Effect c'(TB, H, PB) = .001 (SE=.001), CI(95%) -.001 to .003

It can be seen from figure 4.1, that the regression of depression (X) on the mediator PB (the a3-path) is non-significant (β= .296, t(160) = 2.410, *p*=.027). The regression of the mediator (PB) on to passive suicidal ideations (Y) (the b3-path) is also non-significant (β= .011, t(159) = 1.075 p=.284). These results suggest that PB does not mediate the relationship between depression and passive suicidal ideations. This is confirmed by the results relating to the indirect impact of the unique mediator PB which are also non-significant (Indirect Effect c'(PB) = .003 (SE=.004), CI (95%) -.005 to .011) showing that the lower and upper limits of the 95% confidence interval do in fact include zero and so the null-hypothesis of no mediation cannot be rejected.

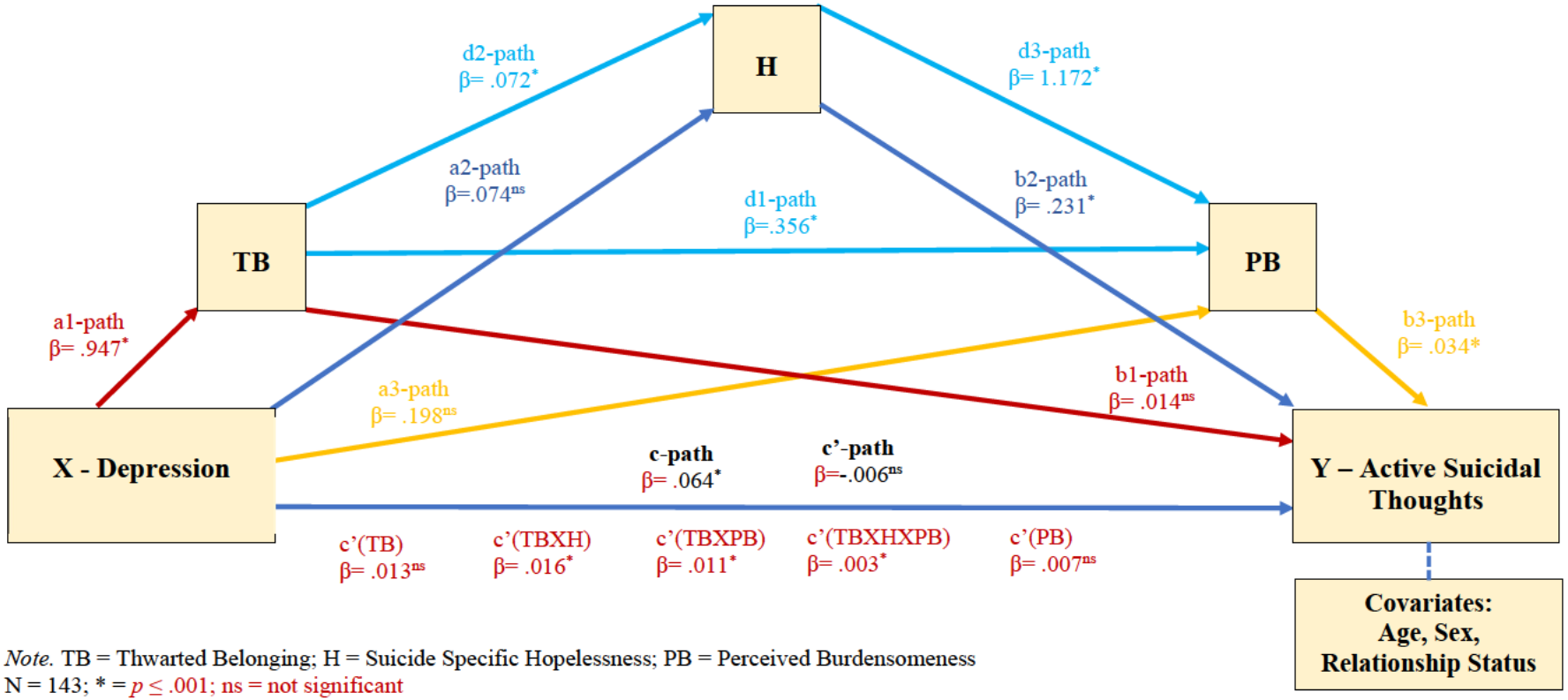
Therefore, for sample 1 (participants at risk of experiencing passive suicidal ideations) the findings seem to suggest that the psychological state (TB) operates as an important mediating influence. Here the results indicate that depression causes TB and that in turn TB leads to passive suicidal ideations. However, the psychological state (PB) does not appear to have the same mediating influence; depression does not seem to cause PB and the presence of PB does not seem to trigger suicidal behaviour.

b) Does TB or PB mediate the causal relationship between Depression and Active Suicidal Thoughts? Figure 4.2 shows the path diagram for the sequential mediational analysis between depression (X) and active suicidal thoughts (Y) when controlling for age, sex and relationship status. The first result to note is that the regression of X on Y (the c-path), ignoring all mediators, is significant: β= .064, t(138) = 3.62, $p \leq .001$. So, depression does seem to cause active suicidal thoughts.

In order to confirm whether this direct effect is eliminated or substantially reduced through the influence of other mediating variables, the total direct effect of X on Y (accounting for the influence of all mediators) should usually be non-significant. It will be noted from the results along the c'-path that this has in fact been confirmed: β= -.006, t(135) = -.346 *p*=.73.

Figure 4.2

Sequential Mediation Analysis for Relationships between Depression, Thwarted Belongingness, Perceived Burdensomeness, Hopelessness and Active Suicidal Thoughts (Sample 2)



Note. TB = Thwarted Belonging; H = Suicide Specific Hopelessness; PB = Perceived Burdensomeness
N = 143; * = $p \leq .001$; ns = not significant

Direct Effect c (X-Y) =.064 (SE=.018), CI (95%) .029 to .099
Indirect Effect c '(X-Y) = -.006 (SE=.017), CI (95%) -.040 to .028
Indirect Effect c'(TB) = .013 (SE=.010), CI (95%) -.003 to .036
Indirect Effect c'(PB) = .007 (SE=.008), CI (95%) -.007 to .025

Indirect Effect c'(TB, PB) = .011 (SE=.004), CI(95%) .004 to .021
Indirect Effect c'(TB, H) = .016 (SE=.006), CI(95%) .006 to .028
Indirect Effect c'(TB, H, PB) = .003 (SE=.001), CI(95%) .001 to .006

The regression of depression (X) on to the mediator TB (the a1-path) is significant (β= .947, t(138) = 7.160, $p \leq .001$), but the regression of the mediator (TB) on to active suicidal thoughts (Y) (the b1-path) is non-significant (β= .014, t(135) = 1.366 p=.174). These results suggest that TB does not mediate the relationship between depression and active suicidal thoughts. This is confirmed by the results relating to the indirect impact of the unique mediator TB which are also non-significant (Indirect Effect c'(TB) = .013 (SE=.010), CI (95%) -.003 to .036) showing that the lower and upper limits of the 95% confidence interval do in fact include zero and so the null-hypothesis of no mediation cannot be rejected.

The regression of depression (X) on the mediator PB (the a3-path) is not significant (β= .198, t(136) = 1.214, p= .227), but the regression of the mediator (PB) on to active suicidal thoughts (Y) (the b3-path) is significant (β= .034, t(135) = 3.824, $p \leq .001$). These results suggest that PB does not mediate the relationship between depression and active suicidal thoughts. This is confirmed by the results relating to the indirect impact of the unique mediator PB which are also non-significant (Indirect Effect c'(PB) = .007 (SE=.008), CI (95%) -.007 to .025) showing that the lower and upper limits of the 95% confidence interval do in fact include zero and so the null-hypothesis of no mediation cannot be rejected.

Therefore, for sample 2 (participants at risk of active suicidal thoughts), a more complex mediational pattern emerges. Here, neither TB nor PB seem to directly mediate the relationship between depression and active suicidal thoughts. Instead, as with sample 1, depression continues to cause TB, but TB does not cause active suicidal thoughts. Moreover, the results suggest that while the state of mind (PB) continues, as in sample 1, not to be caused by depression, PB does seem to have an important causal influence in provoking active suicidal thoughts.

c) Does TB or PB Mediate the Causal Relationship Between Depression and Potentially Lethal Suicidal Attempts? Figure 4.3 shows the path diagram for the sequential mediational analysis between depression (X) and potentially lethal suicide attempts (Y) when controlling for age, sex and relationship status. The first result to note is that the regression of X on Y (the c-path), ignoring all mediators, is significant (β= .069, t(124) = 2.99, $p \leq .001$). So, depression does seem to cause potentially lethal suicide attempts.

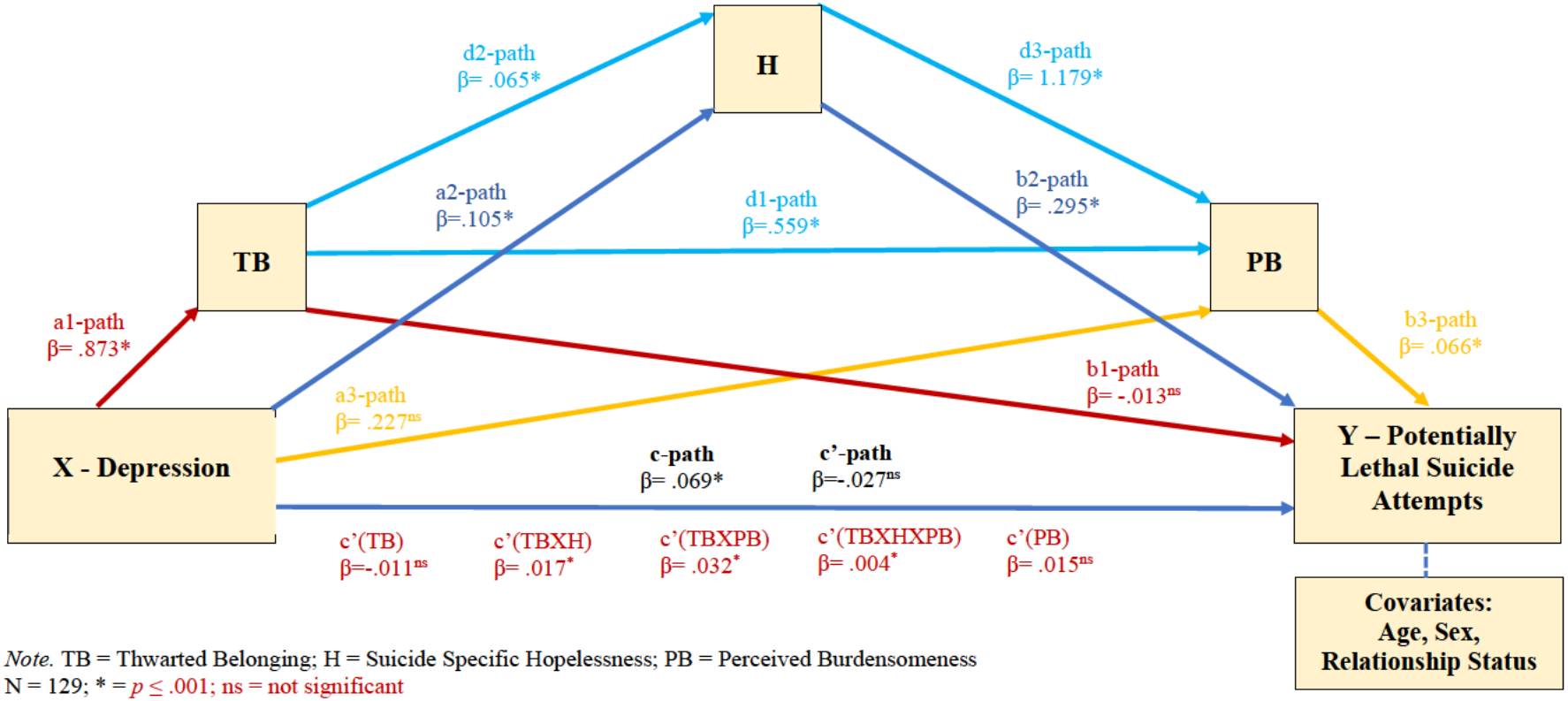
In order to confirm whether this direct effect is eliminated or substantially reduced through the influence of other mediating variables, the total direct effect of X on Y (accounting for the influence of all mediators) should usually be non-significant. It will be noted from the results along the c'-path that this has in fact been confirmed (β= -.027, t(121) = -1.24 p =.218).

The regression of depression (X) on the mediator TB (the a1-path) is significant (β= .873, t(124) = 7.881, $p \leq .001$), but the regression of the mediator (TB) on to potentially lethal suicide attempts (Y) (the b1-path) is non-significant (β= -.013, t(121) = -.813, p=.418). These results suggest that TB does not mediate the relationship between depression and potentially lethal suicide attempts. This is confirmed by the results relating to the indirect impact of the unique mediator TB which are also non-significant (Indirect Effect c'(TB) = -.011 (SE=.014), CI (95%) -.039 to .015) showing that the lower and upper limits of the 95% confidence interval do in fact include zero and so the null-hypothesis of no mediation cannot be rejected.

The regression of depression (X) on the mediator PB (the a3-path) is not significant (β= .227, t(122) = 1.257, p=.211), but the regression of the mediator (PB) on to potentially lethal suicide attempts (Y) (the b3-path) is significant (β= .066, t(121) = 5.960, $p \leq .001$). These results suggest that PB does not mediate the relationship between depression and potentially lethal suicide attempts. This is confirmed by the results relating to the indirect impact of the unique mediator PB which are also non-significant (Indirect Effect c'(PB) = .015 (SE=.013), CI (95%) -.009 to .042) showing that the lower and upper limits of the 95% confidence interval do in fact include zero and so the null-hypothesis of no mediation cannot be rejected.

Figure 4.3

Sequential Mediation Analysis for Relationships between Depression, Thwarted Belongingness, Perceived Burdensomeness, Hopelessness and Potentially Lethal Suicide Attempts (Sample 3)



Note. TB = Thwarted Belonging; H = Suicide Specific Hopelessness; PB = Perceived Burdensomeness
N = 129; * = $p \leq .001$; ns = not significant

Direct Effect C(X-Y) =.069 (SE=.023), CI (95%) .023 to .114
Indirect Effect C'(X-Y) = -.027 (SE=.022), CI (95%) -.071 to .016
Indirect Effect c'(TB) = -.011 (SE=.014), CI (95%) -.039 to .015
Indirect Effect c'(PB) = .015 (SE=.013), CI (95%) -.009 to .042

Indirect Effect c'(TB, PB) = .032 (SE=.009), CI(95%) .016 to .052
Indirect Effect c'(TB, H) = .017 (SE=.007), CI(95%) .005 to .032
Indirect Effect c'(H) = .031 (SE=.011), CI(95%) .010 to .055
Indirect Effect c'(TB, H, PB) = .004 (SE=.003), CI(95%) .002 to .010

Therefore, for sample 3 (participants at risk of potentially lethal suicide attempts) the mediating influence of TB and PB seems to mirror the findings obtained from sample 2. Depression continues to cause TB, but TB alone is not responsible for causing suicidal behaviour. Conversely, while there continues to be no evidence of a causal relationship between depression and PB, the psychological state of mind (PB) continues, as in sample 2, to have a significant influence on suicidal behaviour.

Overall, in terms of attempting to answer the question as to whether the IPTS constructs of TB and PB function as proximal risk factors, mediating the relationship between different level of suicidal behaviour, the evidence seems mixed. It would appear that TB is the first psychological state of mind to emerge because, across all three samples of participants at risk of progressively more serious forms of suicidal behaviour, TB always seems to have been triggered by depression. However, the TB state of mind only seems to be significant in triggering passive suicidal ideations (sample 1). Conversely, the psychological state of mind (PB) does not seem to be caused by depression and does not seem to play an important role in provoking passive suicidal ideations. Instead, PB emerges as a significant risk factor in predicting more serious forms of suicidal conduct, especially active suicidal thoughts (sample 2) and potentially lethal suicide attempts (sample 3).

QUESTION 4: ARE THE IPTS CONSTRUCTS (TB AND PB) RELATED TO EACH OTHER?

Question 4: Context

From the results relating to question 3 above, it was noted across all three samples of participants at risk of progressively more serious forms of suicidal behaviour that PB appears not to be a state of mind triggered by depression (the non-significant a3-paths in figures 4.1, 4.2 and 4.3). Yet, the results also suggest that PB is the only construct that seems to help directly predict the risk of active suicidal thoughts and potentially lethal suicide attempts (the significant b3-paths in figures 4.2 and 4.3).

However, if PB does not arise from depression but influences suicidal behaviours, then it is important to consider the question: From where does the PB state of mind emerge? One possible explanation is that PB emerges from TB; that depression causes TB (already established in question 3), that TB then causes PB, and that PB causes progressively more serious forms of suicidal behaviour (again, already established in question 3) In order to address this issue relating to the origins of PB, it is important to consider the relationship between TB and PB.

According to the IPTS model, when both TB and PB exist at the same time there is an increased risk of more serious suicidal outcomes. However, such a claim lacks sufficient causal specificity because existing simultaneously does not clarify: 1) whether the two constructs operate in a sequential (causally related) formation; or, 2) the temporal nature of the relationship between TB and PB (does the effect of TB cause PB or vice versa). If TB and PB must operate simultaneously to increase the risk of serious suicidal behaviour, then we would expect to find:

a) that a sequential path between TB and PB mediates the causal relationship between depression and passive suicidal ideations;

b) that a sequential path between TB and PB mediates the causal relationship between depression and active suicidal thoughts;

c) that a sequential path between TB and PB mediate the causal relationship between depression and potentially lethal suicide attempts.

Question 4: Results

a) Does the Sequential Path Between TB and PB Mediate the Causal Relationship Between Depression and Passive Suicidal Ideations? It has already been established (see results from question 3, proposition 3a) that TB mediates the relationship between depression and passive suicidal ideations (the c-path), such that depression causes TB (the a1-path) and that TB causes passive suicidal ideations (the b1-path). It was also noted that PB has no mediating influence on the causal relationship between depression and passive suicidal ideations (the a3 and b3 paths).

Looking at the results in Figure 4.1, it will be observed that when controlling for covariates (age, sex and relationship status), the d1-path is significant, suggesting that there exists a sequential connection between TB and PB (β=.189, t(160) = 2.623, $p \leq .001$). However, establishing a sequential path between TB and PB does not establish the mediation of the relationship between depression and passive suicidal ideations. This is confirmed by the results relating to the indirect mediation pattern: Depression – TB – PB – suicidal behaviour which are non-significant (Indirect Effect c'(TBXPB) = .002 (SE=.003), CI (95%) -.002 to .008), showing that the lower and upper limits of the 95% confidence interval do in fact include zero and so the null-hypothesis of no mediation cannot be rejected.

Therefore, for sample 1 (participants at risk of experiencing passive suicidal ideations), taking into account the sequential relationship between TB and PB, the path analysis shows: that depression causes TB, that TB causes PB, but that PB does not cause passive suicidal ideations.

b) Does the Sequential Path Between TB and PB Mediate the Causal Relationship Between Depression and Active Suicidal Thoughts? It has already been established (see results from question 3, proposition 3b) that neither TB or PB mediate the relationship between depression and active suicidal thoughts (the c-path). While depression causes TB (the a1-path), TB does not cause active suicidal thoughts (the b1-path). It was also noted that PB has no mediating influence on the causal relationship between depression and suicidal behaviour, even though PB was causally related to active suicidal thoughts (the b3-path).

Looking at the results in figure 4.2, it will be observed that when age, sex and relationship status are controlled for, the d1-path is significant, suggesting that there exists a sequential connection between TB and PB (β= .356, t(136) = 3.817, $p \leq .001$). Furthermore, establishing a sequential path between TB and PB does seem to mediate the relationship between depression and active suicidal thoughts. This is confirmed by the results relating to the indirect mediation pattern: Depression – TB – PB – suicidal behaviour which are significant (Indirect Effect c'(TBXPB) = .011 (SE=.004), CI (95%) .004 to .021) showing that the lower and upper limits of the

95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

Therefore, for sample 2 (participants at risk of experiencing active suicidal thoughts), taking into account the sequential relationship between TB and PB, the path analysis shows that: depression causes TB; that TB causes PB; and that PB causes active suicidal thoughts.

c) Does the Sequential Path Between TB and PP Mediate the Causal Relationship Between Depression and Potentially Lethal Suicide Attempts? It has already been established (see results from question 3, proposition 3c) that neither TB or PB mediate the relationship between depression and potentially lethal suicide attempts (the c-path), while depression causes TB (the a1-path), TB does not cause potentially lethal suicide attempts (the b1-path). It was also noted that PB has no mediating influence on the causal relationship between depression and suicidal behaviour, even though PB was causally related to potentially lethal suicide attempts (the b3-path).

Looking at the results in figure 4.3, it will be observed that, when controlling for covariates (age, sex and relationship status) the d1-path is significant, suggesting that there exists a sequential connection between TB and PB (β=.559, $t(122) = 4.706$, $p \leq .001$). Furthermore, establishing a sequential path between TB and PB does seem to mediate the relationship between depression and potentially lethal suicide attempts. This is confirmed by the results relating to the indirect mediation pattern: Depression – TB – PB – suicidal behaviour which are significant (Indirect Effect c'(TBXPB) = .032 (SE=.009), CI (95%) .016 to .052) showing that the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

Therefore, for sample 3 (participants at risk of experiencing potentially lethal suicide attempts), taking into account the sequential relationship between TB and PB, the path analysis shows that: depression causes TB; that TB causes PB; and that PB causes potentially lethal suicide attempts.

Overall, in terms of attempting to answer the question as to whether the IPTS constructs, TB and PB, are causally related to each other, the evidence seems clear. Firstly, the results across all three samples report a significant sequential connection between TB and PB. Secondly, because the evidence across all three samples shows that depression causes TB and that PB is not caused by depression, it seems reasonable to conclude that TB causes PB and not the other way around; that the PB state of mind does not emerge as a result of being in a depressed state per se, but is the product of being depressed AND experiencing TB (a thwarted state of belonging). And, finally, the TB and PB causal relationship operates as a mediator which increases the risk of suicidal behaviour. This is evident from the results obtained from samples 2 and 3 which show that depression triggers TB, that TB then causes PB, and that PB alone is then predominantly responsible for causing the more severe forms of suicidality, especially active suicidal thoughts and potentially lethal attempts.

QUESTION 5: DOES HOPELESSNESS MEDIATE THE RELATIONSHIP BETWEEN TB AND PB?

Question 5: Context

From the results relating to question 4 above, it was noted across all three samples of participants at risk of progressively more serious forms of suicidal behaviour that TB and PB are causally related to each other. Assessment of the overall path analysis model also strongly suggests that there is a sequential time ordering to these variables such that TB causes PB, rather than the other way around. If this in fact the case, then such a conclusion gives rise to a further question: How does the state of mind PB emerge from the state of mind TB?

According to the IPTS model, it is important to consider the role of an additional psychological construct, namely, hopelessness. In very general terms, the theory states that as TB and/or PB are endured over a long period of time, a sense of hopelessness descends on participants as they start to believe that their current psychological state will not change. The theory also seems to suggest that gradually

this sense of hopelessness manifests itself as a generally pervasive state of mind which encourages sufferers to increasingly believe that suicide is the only viable option available to them; that their future seems so bleak that the prospect of planning and attempting suicide appears to be a rational solution to their, increasingly unbearable, problems.

However, beyond these general statements, the theory says very little about the nature of hopelessness and to date few studies have considered its specific role within the IPTS predictive model. In particular, it is unclear what causal role hopelessness plays in relation to the emergence of TB and PB, and its causal influence at different levels of suicidal behaviour. If the state of mind, hopelessness (H), does in fact influence the emergence of TB and PB then we would expect to find:

a) that a sequential path between TB and H and PB mediates the causal relationship between depression and passive suicidal ideations;

b) that a sequential path between TB and H and PB mediates the causal relationship between depression and active suicidal thoughts;

c) that a sequential path between TB and H and PB mediates the causal relationship between depression and potentially lethal suicide attempts.

Question 5: Results

a) Does a Sequential Path Between TB and H and PB Mediate the Causal Relationship Between Depression and Passive Suicidal Ideations? It has already been established from the results in question 3, proposition 3a that TB mediates the relationship between depression and passive suicidal ideations. The results in figure 4.1, also show that the regression of TB on to H (the d2-path; β=.065, t(161) = 5.408, $p \leq .001$) and the regression of H on to suicidal behaviour (the b2-path; β=.339, t(159) = 5.831, $p \leq .001$) are both significant when controlling for age, sex and relationship status. This is confirmed by the results relating to the indirect mediation pattern: depression – TB – H – passive suicidal ideations which are significant –

(Indirect Effect c'(TBXH) = .024 (SE=.007), CI (95%) .013 to .038), showing that the lower and upper limits of the 95% confidence interval do not include zero and so the null hypothesis of no mediation can be rejected.

It has also been established from the results in question 3, proposition 3a that PB seems to have no discernible influence during this early stage of suicidal behaviour. The non-significant regression of H on to PB (the d3-path) (β= 1.201, t(160) = 2.760, p =.064), and the regression of depression on to H (the a2-path) also showed no significant causal relationships (β=.017, t(161) = .740, $p \leq .460$). This is confirmed by the results relating to the indirect mediation pattern: Depression – TB - H – PB – passive suicidal ideations which are not significant (Indirect Effect c'(TBxHxPH) = .001 (SE=.001), CI (95%) -.001 to .003), showing that the lower and upper limits of the 95% confidence interval include zero and so the null-hypothesis of no mediation cannot be rejected.

Therefore, in sample 1 (participants at risk of experiencing passive suicidal ideations), after taking into account the sequential relationship amongst TB and H and PB, the path analysis shows that the mediational role of TB is closely related to the emergence of H such that: Depression causes TB, TB causes H, and then both variables contribute to increase the risk of passive suicidal ideations.

b) Does a Sequential Path Between TB and H and PB Mediate the Causal Relationship Between Depression and Active Suicidal Thoughts? It has already been established from the results in question 4, proposition 4b that: depression causes TB; TB causes PB; and, PB causes active suicidal thoughts. The results in Figure 2, also show that the regression of TB on to H (the d2-path; β=.072, t(137) = 4.027, $p \leq .001$), and the regression of H on to PB (the d3-path; β=1.172, t(136) = 2.773, $p \leq .006$) are significant when covariates (age, sex and relationship status) are controlled for. This is confirmed by the results relating to the indirect mediation pattern: depression – TB – H – PB – active suicidal thoughts which are significant (Indirect Effect c'(TBxHxPB) = .001 (SE=.001), CI (95%) .001 to .003) showing that the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

The results also continue to show that while the regression of depression on to H (the a2-path) found no significant causal relationship (β=.074, t(137) = 2.267, *p* =.025), the regression of TB on to H (the d2-path; β=.072, t(137) = 4.027, *p* ≤.001), and the regression of H on to suicidal behaviour (the b2-path; β=.231, t(135) = 5.141, *p*≤.001) are both significant. This is confirmed by the results relating to the indirect mediation pattern: depression – TB – H – suicidal behaviour which are significant (Indirect Effect c'(TBXH) = .016 (SE=.006), CI (95%) .006 to .028) showing that the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

Therefore, in sample 2 (participants at risk of experiencing active suicidal thoughts), after taking into account the sequential relationship amongst TB and H and PB, the path analysis shows the influence of all three mediating variables such that: depression causes TB; TB causes H; H causes PB; and then PB contributes to increasing the risk of active suicidal thoughts. However, it is also important to note that the mediating influence of TB and H (independent of PB) continues (as in sample 1) to have a direct causal influence on suicidal behaviour. This latter predictive model suggests that while TB is not enough to provoke active suicidal thoughts (see results in question 3, proposition 3b), this state of mind remains important in association with H.

c) Does a Sequential Path Between TB and H and PB Mediate the Causal Relationship Between Depression and Potentially Lethal Suicide Attempts? It has already been established from the results in question 4, proposition 4c that: depression causes TB; that TB causes PB; and that PB causes potentially lethal suicide attempts.

The results in figure 4.3, also show that the regression of TB on to H (the d2-path; β=.065, t(123) = 2.707, *p* ≤.001), and the regression of H on to PB (the d3-path; β= 1.179, t(122) = 2.71, p ≤.001) are significant when controlling for age, sex and relationship status. This is confirmed by the results relating to the indirect mediation pattern: depression – TB – H – PB - suicidal behaviour which are significant

(Indirect Effect c'(TBxHxPB) = .004 (SE=.003), CI (95%) .002 to .010), showing that the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

The results also show that the regression of depression on to H (the a2-path; β=.105, t(123) = 2.91, *p*=.004), and the regression of H on to suicidal behaviour (the b2-path; β=.295, t(122) = 5.397, $p \leq .001$) are both significant. This is confirmed by the results relating to the indirect mediation pattern: depression – H – suicidal behaviour which are significant - Indirect Effect c'(H) = .031 (SE=.011), CI (95%) .010 to .055 – showing that the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

Therefore, in sample 3 (participants at risk of experiencing potentially lethal suicide attempts), taking into account the sequential relationship between TB and H and PB, the path analysis shows the influence of all three mediating variables such that: depression causes TB; TB causes H; H causes PB; and then PB contributes to increasing the risk of causing potentially lethal suicide attempts. However, it is also important to note the mediating influence of H (independent of TB and PB). Significance of the depression – H – suicidal behaviour path model suggests that the emergence of H as a pervasive (all consuming) state of mind may in turn give rise to a unique and direct causal influence on suicidal behaviour, especially potentially lethal attempts.

Overall, in terms of attempting to answer the question as to whether H mediates the relationship between TB and PB, the evidence seems enlightening. Firstly, the results across all three samples reported H to be an important causal construct alongside TB and PB. Secondly, for both sample 2 and sample 3, the full predictive model was confirmed whereby the direct causal relationship between depression and suicidal behaviour was shown to be mediated by TB and H and PB. This predictive model states that: depression causes TB; that TB causes H; that H causes PB; and that PB causes serious suicidal behaviour, especially active suicidal thoughts and potentially lethal suicide attempts. And, finally, the evidence suggests that in situations where people experience the more severe forms of suicidal conduct, H is

likely to become a pervasive state of mind such that it might be reinforced by depression and may be sufficient in itself (independent of TB and PB) to encourage potentially lethal suicide attempts.

QUESTION 6: DOES THE IPTS CONSTRUCT OF AC HELP PREDICT SUICIDE ATTEMPTS?

Question 6: Context

According to the IPTS, while all three constructs (TB, PB and hopelessness) are important to the process of identifying those at risk of suicide, they are only meaningful up to the point of predicting active suicidal thoughts. After this point comes the outward task of actually making an attempt to die by suicide.

The IPTS says that the process of making an attempt requires the presence of intent, and that this is the motivational force driving suicidal behaviour. Within the theoretical framework, suicidal intent can only be formulated through an additional fourth construct referred to as Acquired Capability (AC). This premise states that the capability to act on suicidal desires is the product of two conditions: (i) a lowered fear of death which is important in the development of suicidal plans and intent, and (ii) higher levels of pain tolerance which is important in the transition from suicidal intent to suicide attempt. Furthermore, it is asserted that this fourth construct is something which must be acquired over time usually in response to exposure to painful or provocative events.

If this is true, we would expect to find:

a) that AC is related to suicide risk;
b) that AC does not mediate the causal relationship between depression and passive suicidal ideations;
c) that AC partially mediates the relationship between depression and active suicidal thoughts;
d) that AC mediates the causal relationship between depression and potentially lethal suicide attempts.

Question 6: Results

a) Does AC Predict Risk of Suicide? Correlational analyses between each item of the Acquired Capability for Suicide Scale-20 (ACSS-20) with total suicide risk (measured using the total score from all 4 items of the SBQ-R) revealed that only eight items from the ACSS-20 were significantly related to suicide risk at a level of $p \leq .0005$. Table 4.3 presents a summary of these eight items and their correlation coefficient values.

Table 4.3.

Coefficient Values for ACSS Items Significantly Correlated with Total Suicide Risk

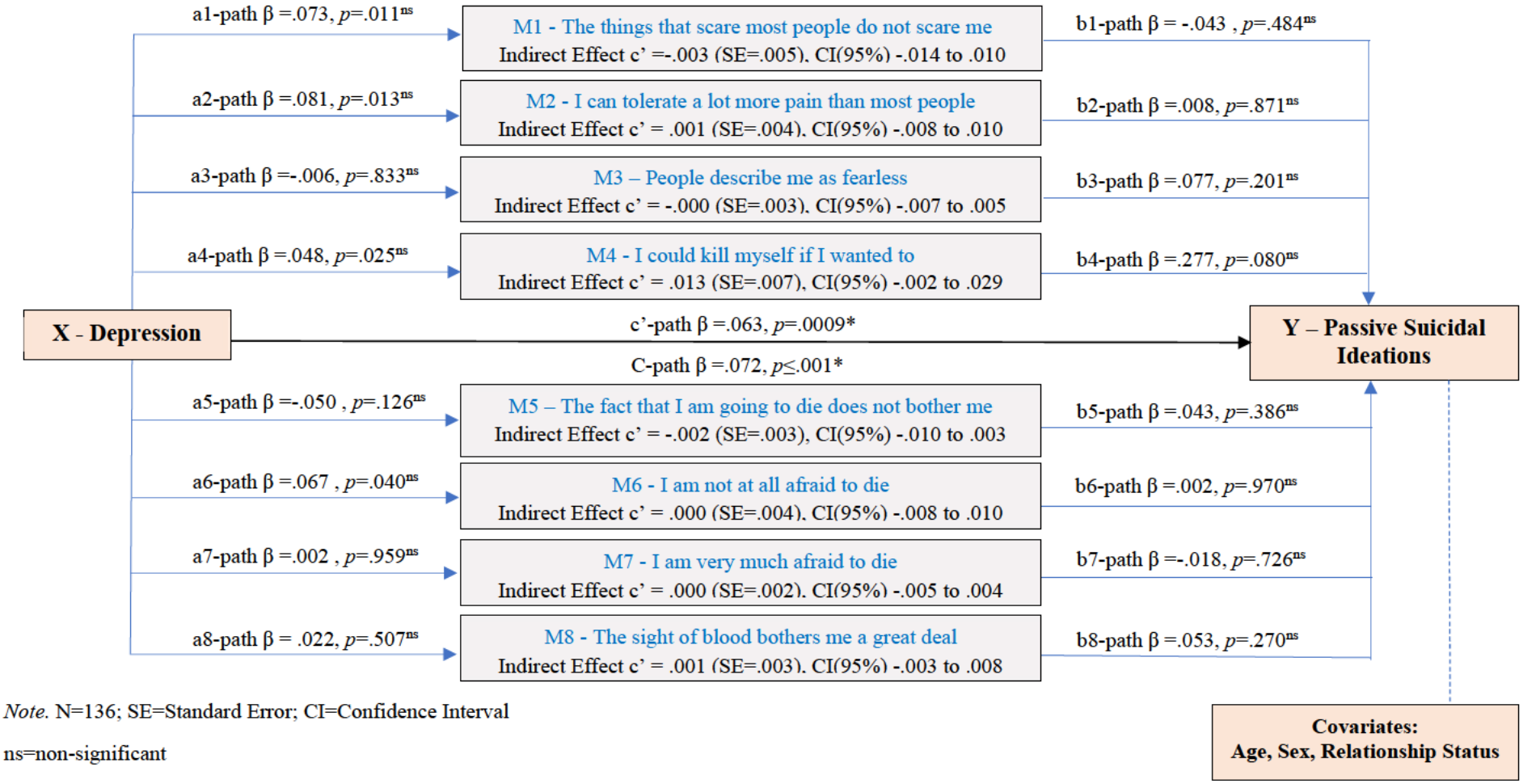
ACSS Item	**r***
Things that scare most people do not scare me	.442
I can tolerate a lot more pain than most people	.308
People describe me as fearless	.232
I could kill myself if I wanted to	.749
The fact that I am going to die does not bother me	.212
I am not at all afraid to die	.483
I am very much afraid to die (reverse)	.326
The sight of my own blood does not bother me	.188

*Note. Total N=236. * All coefficients were significant at p≤.001. r=correlation coefficient value.*

In terms of effect size, as noted in Chapter 2, Cohen (1988) suggests that coefficient values above $r=.30$ may be viewed as representing a moderate association while values above $r=.5$ constitute a strong association between variables. As such, it can be seen from table 4.3 that N=5 (63%) of the items demonstrated values within the range $r=.308$ ("I can tolerate a lot more pain than most people") to $r=.749$ ("I could kill myself if I wanted to"). Of these items, the median value represented a moderate association at r=.443, while only N=1 ("I could kill myself if I wanted to") demonstrated a strong correlation with a coefficient score above $r=.5$.

Figure 4.4

Parallel Mediational Model for Relationships between Depression, Eight Items from the ACSS-20 Scale and Passive Suicidal Ideations (Sample 1)



Note. N=136; SE=Standard Error; CI=Confidence Interval

ns=non-significant

b) Does AC Mediate the Causal Relationship Between Depression and Passive Suicidal Ideations? Figure 4.4 shows the path diagram for the parallel mediational analysis between depression (X) and passive suicidal ideations (Y). The first result to note is that the regression of X on Y (the c-path), ignoring all mediators, is significant: β= .072, t(134) = 4.047, $p \leq .001$ when age, sex and relationship status are included as covariates. Therefore, as previously confirmed in question 3, depression seems to cause passive suicidal ideations.

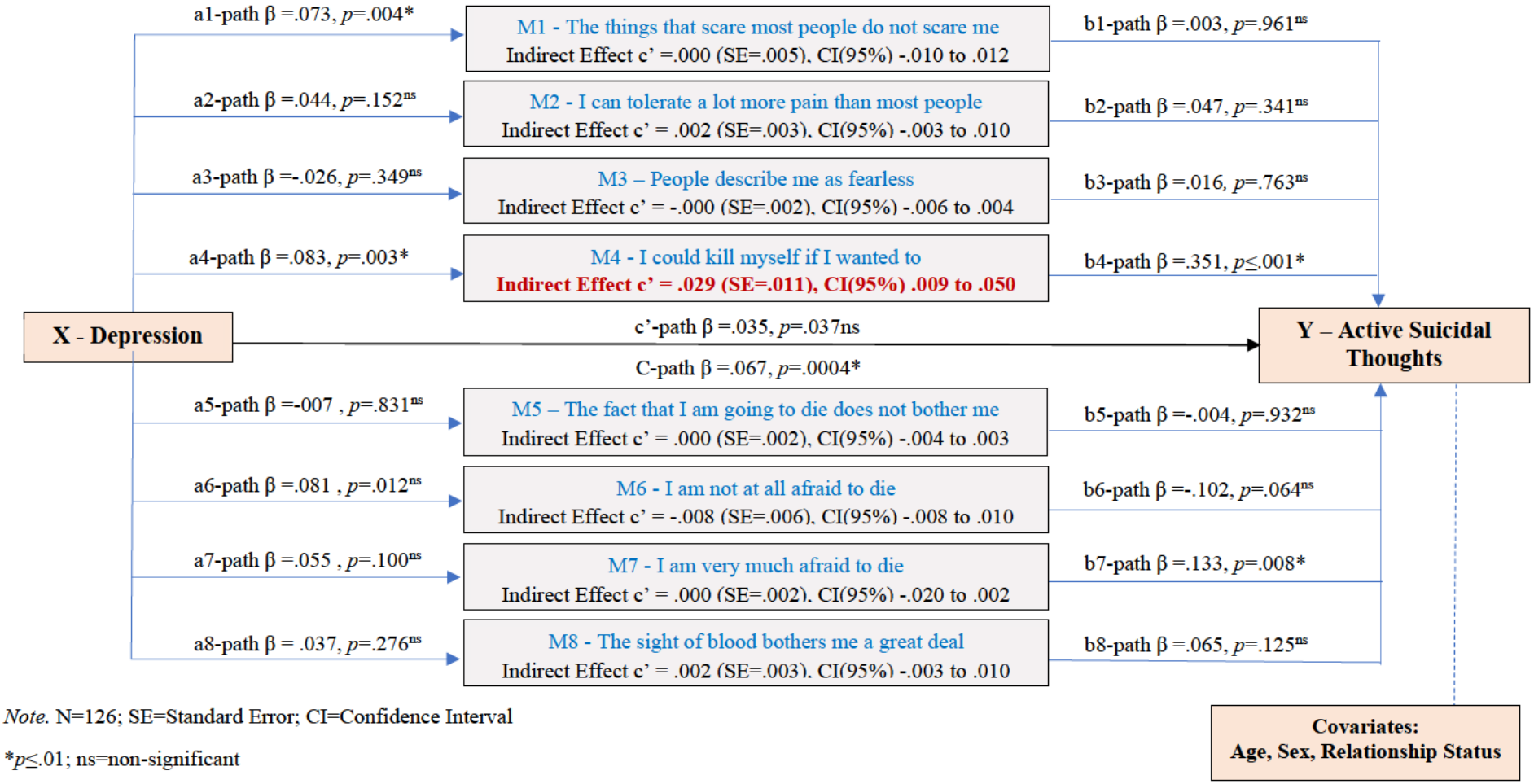
In order to confirm whether this direct effect is eliminated or substantially reduced through the influence of other mediating variables, the total direct effect of X on Y (accounting for the influence of all mediators) should usually be non-significant. However, it will be noted from the results along the c' path that this is not the case (β= .063, t(126) = 3.404 $p \leq .001$). This suggests that none of the ACSS items acted as significant mediators. This finding is supported by results relating to the indirect impact of each ACSS item which show that the lower and upper limits of the 95% confidence intervals all include zero, and so the null hypothesis of no mediation cannot be rejected.

Therefore, for sample 1 (participants at risk of experiencing passive suicidal ideations) the findings suggest that AC (represented by 8 items of the ACSS-20) does not appear to have an important mediating influence and the presence of AC does not therefore trigger suicidal behaviour.

c) Does AC Mediate the Causal Relationship Between Depression and Active Suicidal Thoughts? Figure 4.5 shows the path diagram for the parallel mediational analysis between depression (X) and active suicidal thoughts (Y). It will be noted that the regression of X on Y (the c-path), ignoring all mediators, is significant (β= .067, t(124) = 3.669, $p \leq .001$) when controlling for age, sex and relationship status. This confirms findings from question 3 that depression leads to active suicidal thoughts.

Figure 4.5

Parallel Mediational Model for Relationships between Depression, Eight Items from the ACSS-20 Scale and Active Suicidal Thoughts (Sample 2)



Note. N=126; SE=Standard Error; CI=Confidence Interval

*$p \leq .01$; ns=non-significant

In order to confirm whether this direct effect is eliminated or substantially reduced through the influence of other mediating variables, the total direct effect of X on Y (accounting for the influence of all mediators) should usually be non-significant. Results along the c' path indicate that this is the case (β= .35, t(124) = 2.108, *p*=.037). This suggests that AC is an important mediating influence in the causal relationship between depression and active suicidal thoughts when controlling for age, sex and relationship status.

To understand which specific items are important, the a-paths (between depression and the mediator), and the b-paths (between the mediator and suicidal behaviour) should both be significant. Results in figure 4.5 show that the regression of depression (X) on mediator 4 (the a4-path; "I could kill myself if I wanted to") is significant (β =.083, t(124)= 3.029, *p*=.003), and the regression of this mediator on to active suicidal thoughts (Y) (the b4-path) is also significant (β =.351, t(116)= 6.532, *p*≤.001).

These results suggest that the ACSS item "I could kill myself if I wanted to" actually mediates the relationship between depression and active suicidal thoughts. However, in order to confirm this, it is important to establish whether the magnitude or indirect impact of the unique mediator is significant. This is in fact confirmed by the results - Indirect Effect c'(M4) = .029 (SE=.011), CI (95%) .009 to .050 – which shows that the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

Therefore, in sample 2 (people experiencing active suicidal thoughts) findings indicate that only one AC factor "I could kill myself if I wanted to" operates as a significant mediating influence, important in the transition from passive suicidal ideations to active suicidal thoughts.

d) Does AC Mediate the Causal Relationship Between Depression and Potentially Lethal Suicide Attempts? Figure 4.6 illustrates the path diagram for the parallel mediational analysis of the relationship between depression and potentially

lethal suicide attempts. It shows that the relationship between depression and suicidal behaviour (regression of X on Y; C-path) is significant (β =.086, t(117)= 3.578, *p*=.001) when controlling for age, sex and relationship status. This confirms that depression leads to potentially lethal suicide attempts.

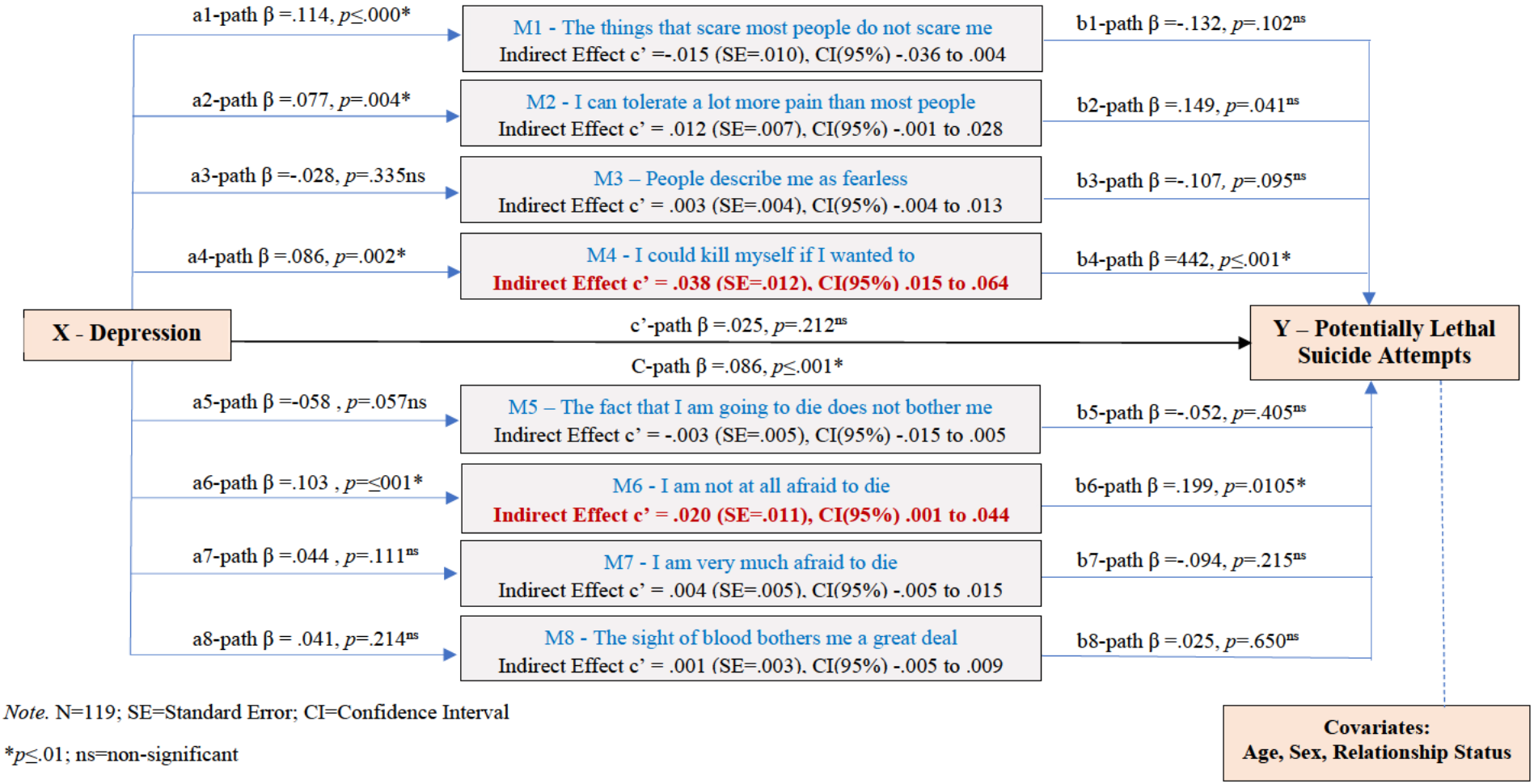
It will also be noted that the total indirect effect of X on Y (accounting for the influence of all mediators; c'-path) is non-significant (β =.025, t(117)= 1.256, *p*=.212). This indicates that AC has a mediating effect on the relationship between depression and potentially lethal suicide attempts.

Analysis of the paths presented in figure 4.6, shows that as in sample 2, the regression of depression on mediator 4 (a4-path) ("I could kill myself if I wanted to) is significant (β =.086, t(117)= 3.115, *p*=.0023), and the b4-path between the mediator an suicidal behaviour is also significant (β =.442, t(109)= 6.344, *p*≤.001).

These results suggest that, as in sample 2, this ACSS item mediates the relationship between depression and potentially lethal suicide attempts. However, in order to confirm this, we would expect the magnitude or indirect impact of the unique mediator to be significant. This is in fact confirmed by the results - Indirect Effect c'(M4) = .038 (SE=.012), CI (95%) .015 to .064 which shows that the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

It will also be noted from figure 4.6, that the regression from depression to mediator 6 ("I am not at all afraid to die") (a6-path) is significant (β =.103, t(117)= 3.718, *p*≤.001) and the regression from the mediator to suicidal behaviour (b6-path) is nearing significance (β =.199, t(109)= 2.486, *p*=.0105).

Figure 4.6 *Parallel Mediational Model for Relationships between Depression, Eight Items from the ACSS-20 Scale and Potentially Lethal Suicide Attempts (Sample 3)*



Note. N=119; SE=Standard Error; CI=Confidence Interval

*$p \leq .01$; ns=non-significant

This finding suggests that a second mediator ("I am not at all afraid to die") mediates the relationship between depression and potentially lethal suicide attempts. To confirm if this is the case, we would expect the indirect effect of the mediator to be significant. Results confirm this to be the case - Indirect Effect c'(PB) = .020 (SE=.0108), CI (95%) .0012 to .044 as the lower and upper limits of the 95% confidence interval do not include zero and so the null-hypothesis of no mediation can be rejected.

These results suggests that, in addition to the readiness to die factor of AC ("I could kill myself if I wanted to"), a second factor ("I am not at all afraid to die") is important in the progression to experiencing potentially lethal suicide attempts.

Overall, in terms of being able to answer the question as to whether AC helps predict suicide attempts, the evidence seems to be clear. Firstly, results show AC (and specifically, 8 items of the ACSS) to be an important construct in the prediction of suicidal risk. Secondly, none of the ACSS items were found to be important in the development of passive suicidal ideations, which is in line with the assumptions of the IPTS model. Thirdly, there is a mediating influence for one ACSS item ("I could kill myself if I wanted to") in the relationship between depression and active suicidal thoughts. This suggests that transition from passive ideations to active thoughts seems to be based on acquiring a specific capability – a readiness to die. And, finally, two items were important mediating influences on the relationship between depression and potentially lethal suicide attempts - "I could kill myself if I wanted to" and "I am not at all afraid to die". This seems to suggest that the transition from active suicidal thoughts to potentially lethal suicide attempts seems to be dependent on not only a readiness to die, but also an additional aspect of capability – a reduced fear of death.

CONCLUSION

This chapter has presented the results in relation to each research question guiding this study. The next chapter discusses the key findings in the context of previous literature and proposes resulting key implications for suicidal risk assessment, public and professional education and therapeutic intervention.

CHAPTER 5

DISCUSSION

Chapters 1 and 2 of this research project evaluated the theoretical and empirical literature surrounding the IPTS model of suicidal behaviour. Following a critical assessment of this research (for a review see section 4 of Chapters 1 and 2), six conceptual difficulties underlying the logical integrity of the IPTS model were highlighted. Chapter 4 presented the results of investigations into each of these principal difficulties. This chapter aims to generate a broader discussion of these findings which will be organised around the study's six principal research questions:

1) Do the IPTS constructs (TB, PB and hopelessness) represent general predictors of mental health distress or are they specific predictors of suicidal risk?

2) Do the IPTS constructs (TB, PB and hopelessness) remain important predictors of risk when compared with the more traditional, well established epidemiological (age, sex and relationship status) and psychopathological (depression and anxiety) risk factors already known to influence suicidal behaviour?

3) Do the IPTS constructs (TB and PB) function as proximal risk factors (mediators) between depression and suicidal behaviour?

4) Are the IPTS constructs (TB and PB) related to each other?

5) Does hopelessness mediate the relationship between TB and PB?

6) Does the IPTS construct of AC help predict suicide attempts?

This chapter is structured into two sections. In the first section, findings in relation to each research question will be discussed in terms of: (i) the overall aims of each

research question; (ii) the context of findings in terms of previous literature, and (iii) the contribution to knowledge. The second section discusses implications of the findings in relation to: (i) clinical risk assessment of suicidal behaviours; (ii) public and professional education about suicidal behaviours, and (iii) therapeutic treatment of suicidal behaviours.

Question 1: Do the IPTS Constructs (TB, PB and Hopelessness) Represent General Predictors of Mental Health Distress or are they Specific Predictors of Suicidal Risk?

As discussed in Chapters 1 and 2, the association between each of the IPTS key constructs (TB, PB and Hopelessness) and suicidal behaviour is widely supported in wider literature (Ribeiro et al., 2015; Burke et al., 2016). However, it has been argued that a model reliant on only three interpersonal states is too simplistic to explain a behaviour as complex as suicide (Hjelmeland & Knizek, 2020). The aim of question 1 was therefore to compare the effectiveness of the IPTS constructs as a model of suicide with their effectiveness as indicators of general mental health distress (comprising of depression, anxiety and self-harm).

Results from the current study indicated that the IPTS model seems to be a better predictor of suicide risk than depression, anxiety or self-harm. This confirms the principal assumptions of the IPTS theory (see Joiner, 2005; Van Orden et al., 2010). This is important because while the theoretical framework of the IPTS describes the constructs of TB, PB and hopelessness as comprising factors which have been individually associated with suicide (e.g. social isolation, loneliness, low self-esteem and lack of positive future thinking), these factors have also been previously associated with more general mental health difficulties. Determining that the IPTS constructs represent a meaningful model of suicide risk therefore confirms the theoretical basis for the IPTS model.

Comparing the IPTS constructs as a model of suicide against mental health distress also revealed novel findings about their relative importance in predicting a range of mental health difficulties. Results showed that each construct had a different role to play in general mental health distress. Firstly, TB was important to the development of depression, anxiety and self-harm. It therefore seems that negative perceptions of interpersonal relationships which result in experiences such as social isolation and loneliness, contribute to a range of mental health difficulties. It is also noteworthy that TB was the only IPTS construct to be associated with all types of psychological distress. This emphasises its extensive influence across the spectrum of mental health wellbeing.

Secondly, the results suggest that PB had no obvious connection to depression, anxiety or self-harm. This suggests that negative perceptions of one's self-image or experiences of low self-esteem are not direct causal contributors to common mental health difficulties. Interestingly, by extension, this finding implies that experiences of external social relationships related to TB, are more useful predictors of depression, anxiety or self-harm than internal perceptions and feelings about oneself. The fact that PB was important in the prediction of suicide risk, but not in more general measures of psychological wellbeing, confirms its role in predicting the most serious forms of psychopathology.

Thirdly, results showed that hopelessness was related to self-harm but had no role in depression or anxiety. Self-harmful behaviours tend to emerge in response to unresolved psychological distress (Harvey & Brown, 2012) and typically carry more severe consequences for an individual than feelings of depression or anxiety. This pattern of results therefore seems to propose that hopelessness is useful in predicting more serious forms of psychological distress including self-harm and suicide.

Overall, findings contribute to knowledge in three ways. Firstly, it appears that rather than being too simplistic a model to predict suicide (Hjelmeland & Knizek, 2020), the IPTS actually represents a parsimonious framework specific to understanding the development of suicidal behaviours. Secondly, confirming the IPTS model as an

effective predictor of suicide risk provides support for similar models based on the IPTS constructs (see for example the 3ST; Klonsky & May, 2014 and the IMV; O'Connor, 2011) which include factors such as hopelessness, connectedness, TB and PB. Thirdly, results show that TB appears to have a prominent role in conferring risk for various forms of mental health distress (depression, anxiety and self-harm). This suggests that while TB may be a risk factor common to a range of psychopathological difficulties, it is its combination with PB and hopelessness which differentiates suicidal behaviour from other forms of mental health distress.

Question 2: Do the IPTS Constructs (TB, PB and Hopelessness) Remain Important Predictors of Risk when Compared with the more Traditional, Well Established Epidemiological (age, sex and relationship status) and Psychopathological (depression and anxiety) Risk Factors Already Known to Influence Suicidal Behaviour?

Chapters 1 and 2 discussed the theoretical and empirical literature showing that demographic variables (age, sex and relationship status), and mental health related factors (depression and anxiety), are important in suicide. However, their causal relationship is rarely understood within the context of the IPTS model. Research question 2 therefore aimed to compare their importance in suicide relative to each other and the IPTS constructs.

Results from this study demonstrated a hierarchical pattern whereby at step 1, demographic factors (age, sex and relationship status) were shown to be important to suicide. However, results from step 2 of the analysis revealed that demographic variables did not account for as much variance in suicidal risk as depression and anxiety (when controlling for the effects of age, sex and relationship status). Finally, when the IPTS constructs were added to the model in step 3, depression and anxiety lost significance. These findings concur with those of previous research observing a role for demographic and mental health factors in suicide (Hawton et al., 2013).

The ability to compare the relative importance of both traditional risk factors and those proposed by the IPTS model in predicting suicidal risk suggests that the IPTS constructs seems to have a closer, more proximal relationship to suicide, while other factors have a more detached, distal influence. This in part, helps explain why most people who are suicidal are depressed, but why most people experiencing depression are not suicidal (Handley et al., 2018; Hawton et al., 2013) – depression may be strongly associated with suicide, but it only exerts an influence on suicidal behaviour through its effect on the IPTS constructs.

Findings also confirmed the importance of depression which remained the strongest predictor of suicidal risk outside of the IPTS constructs. The role of depression is commonly neglected in empirical studies of the IPTS due to difficulties separating its overlapping symptomology with that of suicidal ideation (see Chapter 2 for further discussion). However, these results establish depression as a crucial component, along with the IPTS constructs, in the development of suicidal behaviours.

Previous literature has consistently established the importance of epidemiological factors such as age and sex (Skogman, Alsen & Öjehagen, 2004; ONS, 2020), as well as mental health factors such as depression and anxiety (Hawton et al., 2013) in influencing the development of suicidal behaviour. However, this knowledge has not resulted in a better understanding of who may be most at risk of suicidal behaviour (Franklin et al., 2016). Overall, this study's findings extend current knowledge to show that previously identified risk factors based on demographics or mental health difficulties are important but not determining or immediate risk factors. Rather, their influence on suicide risk appears to operate in a distal manner through the more pertinent risk factors of TB, PB and hopelessness. It therefore appears that the IPTS provides a more effective and specific framework for understanding the development of suicidal behaviour than previous models of suicide based on demographic or psychopathological factors.

Question 3: Do the IPTS Constructs (TB and PB) Function as Proximal Risk Factors (Mediators) between Depression and Suicidal Behaviour?

A primary hypothesis of the IPTS is that TB and PB are proximal risk factors for the development of suicidal behaviour (Joiner, 2005; Van Orden et al., 2010). As discussed in Chapter 2, much previous research has looked at the roles of TB and PB in relation to suicide (for a full review see Chu, Buchman-Schmitt et al., 2017). However, the majority of these studies understand the relationship in terms of a simple correlation or sequential regression, and attempts to develop models which analyse the mediational influence of TB and PB are scarce (Van Orden, 2014).

This study adopted a different approach. In order to evaluate whether TB and PB act as proximal risk factors for suicide, this question aimed to generate a full mediational model in which: (i) depression was the independent variable; (ii) suicidal behaviour was the dependent outcome variable, and (iii) TB and PB were mediators in this relationship.

Results from this study revealed two important findings. Firstly, when TB and PB were included as mediators, the direct relationship between depression and suicidal behaviour became insignificant. This establishes the presence of a mediation effect and supports the IPTS claim that the two constructs are proximal factors in understanding suicide risk. Secondly, this study's results showed that TB and PB behaved differently to each other in terms of their relationships both with depression and with suicidal behaviour. Depression was responsible for causing TB in the case of all participants at risk of suicide. TB was then important only in the development of passive suicidal ideations, and on its own was not sufficient to prompt more serious forms of suicidal conduct (active suicidal thoughts and potentially lethal suicide attempts). In terms of PB, results indicated that depression was not responsible for its formation across any level of suicidal behaviour. It was also found that PB has no role in triggering passive suicidal ideations. However, findings supported the role of PB in provoking both active suicidal thoughts and potentially lethal suicide attempts. Overall, findings that the pattern of suicidal behaviour varies

according to the prominence of TB or PB confirms that the two constructs are distinct from each other.

Findings from the current study, demonstrating that TB and PB are proximal in their relationship with suicidal behaviour confirm an important hypothesis of the IPTS model (Van Orden et al., 2010). Previous research has reported similar mediational roles for TB and/or PB in the relationship between suicide and various factors including anger, negative emotion and need satisfaction (Hawkins et al., 2014; Rogers et al., 2017; Tucker & Wingate, 2014). However, most results are inconclusive with many reporting no mediational role for one or both IPTS constructs (Mbroh et al., 2018; Puzia et al., 2014; Suh et al., 2016). As a result, previous studies have failed to consistently test or demonstrate TB and PB as proximal risk factors in any meaningful way which reflects the theoretical assumptions of the IPTS (Paniagua et al., 2010; Van Orden, 2014). Understanding the roles of TB and PB as part of a sequential mediational pattern involving depression and suicidal behaviour has however, enabled the results of this study to verify the claims of the IPTS that it's constructs are proximal in nature.

Results from this study also support a second assertion of the IPTS – that TB and PB are distinct from each other (Van Orden et al., 2010). Studies analysing the factor structure of the INQ have suggested that TB and PB are separate constructs (Bryan, 2011; Freedenthal et al., 2011). However, it has been argued that the constructs may not able to exist independently as experiences of PB are reliant on experiencing a sense of belonginess (Hjelmeland & Knizek, 2020). Most empirical studies focus only on testing the main effects of TB and/or PB in relation to suicidal ideation (see Chapter 2 for a fuller discussion). This approach has limited the ability of previous research to understand different patterns of behaviour in TB and PB as it has not differentiated between different severities of suicidal behaviour. As such, there is a paucity of literature seeking to understand any differences in the way TB and PB function (Ribeiro & Joiner, 2010). Results from the current study which confirm distinct roles for TB and PB therefore offer novel and significant findings about the individual roles of each construct.

In terms of TB, this study's results propose two important findings. Firstly, it seems to emerge (in all participants at risk of suicidal behaviour) from depression. The IPTS is ambiguous in determining the contribution of depression to its theoretical model (Van Orden, 2014). As a result, empirical studies tend to adopt one of two approaches to dealing with depression: (i) it is controlled for and covaried out of any analysis, or (ii) it is omitted completely (see Chapter 2 for a fuller discussion). Including depression as an independent variable in the analysis has enabled this study to confirm its role as a distal risk factor in suicidal behaviour. Results suggest that depression exerts an influence on suicidal ideation only through its influence on TB. The primary role of depression in suicidal behaviour therefore appears to be in its ability to trigger feelings of TB which in turn is responsible for passive suicidal ideations.

Secondly, results from the current study showed TB triggered passive suicidal ideations but was not responsible for causing any other form of suicidal behaviour. TB has been extensively linked to suicidal ideations (see for example Batterham et al., 2017; Chu, Rogers et al., 2018). However, contradictory findings showing no association between TB and suicidal behaviour have caused some to posit that PB may act as a better indicator of suicide risk (Hawkins et al., 2014; Teismann et al., 2017). Characterising suicidal behaviour as a spectrum of different levels of severity has enabled this study's results to determine that TB has a role only in passive suicidal ideation. Studies reporting no significant role for TB may therefore be explained by previous research using outcome measures which capture more serious forms of behaviour than passive suicidal ideations.

In terms of PB, this study found two important results. Firstly, PB was responsible only for causing the two most serious forms of suicidal behaviour (active suicidal thoughts and potentially lethal suicide attempts) and had no role in passive suicidal ideations. Past research has established an association between PB and suicidal ideation (Wilson et al., 2017; Woodward et al., 2014). Results from this study propose that such findings relate to active suicidal thoughts rather than passive

ideations. Previous research has also interpreted cases where PB demonstrated an association with suicidal behaviour, but TB did not, as indicative of PB being a more robust predictor of suicidal risk (Fink-Miller, 2015; Hawkins et al., 2014). However, results from the current study suggest that this conclusion may be misguided. As a result of differentiating between suicidal behaviours of varying severity, findings from this study suggest that the role of PB is specific to more serious types of suicidal conduct.

Secondly, results from the current study showed that PB did not seem to be caused by depression in any of the participants at risk of suicide. Evidence investigating the origins of PB within the context of depression and suicidal behaviour is rare. Instead, most studies focus on links between suicide and factors identified by the IPTS as contributing to a sense of PB such as physical disability and low self-esteem (Khazem et al., 2015; Russell et al., 2009). However, this approach tells us little about whether PB may emerge as a result of interactive processes with depression or TB. In considering PB as part of a sequential mediational model, this study's results have been able to establish that experiences of depression do not directly result in feelings of burdensomeness. This finding suggests that PB must arise from a different source. Given the importance of PB's role in predicting more serious forms of suicidal behaviour (as demonstrated by this study), it is important to establish from where PB may emerge.

Previous literature has questioned whether the constructs of TB and PB are sufficiently distinct from each other (Hjelemend & Knizek, 2020; Ribeiro & Joiner, 2009). In determining that each construct has a different role to play in influencing risk for suicidal behaviours, this study has confirmed that TB and PB are, in fact distinct from each other and each has a unique contribution to suicidal risk. This supports the theoretical characterisation of TB and PB as distinct but inter-related constructs (Van Orden et al., 2010). These findings also extend our knowledge of the IPTS constructs in two ways. Firstly, results confirm that TB and PB mediate the relationship between depression and suicidal behaviour, and are therefore more proximal risk factors for suicide. This is in line with similar findings where TB

and/or PB operated as mediators of the relationship between various distal factors (such as anger, insomnia and problematic alcohol use) and suicidal behaviour (Hawkins et al., 2014; Chu, Hom et al., 2017; Gallyer et al., 2018). However, the inclusion of depression as the independent variable in the current study extends our understanding of the role of TB and PB in its established relationship with suicide.

Secondly, inconsistent findings about the association between TB and PB and suicide in previous studies has resulted in claims that one construct may be more important in explaining suicidal behaviour than the other (O'Keefe et al., 2014; Wilson et al., 2017; Mitchell et al., 2020). However, results from the current study specify different roles for TB and PB at each level of suicidal behaviour. For example, only TB seems to have any influence in the development of passive suicidal ideations, but the combination of TB and PB is important in the development of more serious forms of suicidal behaviour. This therefore shifts the current debate from determining which is the most powerful construct to instead, understanding when each construct become most influential.

Question 4: Are the IPTS Constructs (TB and PB) Related to Each Other?

As discussed in Chapter 1, the IPTS characterises TB and PB as distinct but inter-related constructs (Van Orden et al., 2010). Results from Question 3 confirmed the constructs as separate entities with differing roles to play in suicidal behaviour. However, conflicting findings in extant literature about the importance of TB and PB relative to each other (Chu, Buchman-Schmitt, Moberg et al., 2016; O'Keefe et al., 2014; Van Orden et al., 2008) have prompted debate about the exact nature of their relationship. Central to this debate, are questions about whether TB and PB work independently or together to influence suicidal behaviour. The theoretical perspective posits that TB and PB can exist jointly, and where they do so, active suicidal desire will result (Van Orden et al., 2010). But it has also been argued that the co-existence of the two constructs is conceptually impossible (based on assumptions that a sense of belonging to something or someone is required to generate experiences of burdensomeness) (Hjelmeland & Knizek, 2020). This question therefore aimed to establish whether TB and PB are related to each other

and to understand any mediating effect their relationship may exert on suicidal behaviour.

Results from this study established a directional causal time ordering to the relationship between TB and PB. Firstly, TB led to feelings of PB across all three levels of suicidal behaviour. Secondly, results from Question 3 indicated that depression led to TB in all levels of suicidal behaviour, but did not lead to PB. Taken together results from this study therefore propose that depression leads to TB, TB leads to either passive suicidal ideations or PB, and PB in turn, causes active suicidal thoughts and/or potentially lethal suicide attempts.

Most previous studies testing the correlational relationship between TB and PB reveal a strong association (Anestis et al., 2015; O'Keefe et al., 2014; Rogers et al., 2017). However, while there are a growing number of such studies, research testing the directional nature of any relationship between TB and PB is scarce (Van Orden, 2014). As discussed in Chapter 2, some studies operationalise the simultaneous influence of TB and PB as a 2-way interaction (see for instance: Anestis et al., 2015; Baams et al., 2015; Teismann et al., 2017). In many cases these interactions have demonstrated a significant effect on suicidal behaviour (Silva et al., 2017; Wilson et al., 2017). However, this approach does not reflect the original IPTS formulation of TB and PB as being a simultaneous presence on the development of active suicidal desire (Van Orden, 2014), and does not demonstrate any directional relationship between the two constructs.

Results from the current study which indicate that TB causes PB therefore help clarify the nature of the relationship in two important ways. Firstly, they confirm that TB and PB may co-exist, and that in instances where they do, more serious forms of suicidal behaviour are likely to result. This supports the fundamental assumption of the IPTS model that the joint presence of both constructs results in the most serious forms of suicidal behaviour (Van Orden et al., 2010). It also helps clarify inconsistent findings focussing on the moderating effects of the constructs (Anestis et al., 2015; Chu, Hom et al., 2018). Secondly, results from this study suggest that

PB emerges from feelings of TB which proposes a time ordering to their influence on all levels of suicidal behaviour. This sequential mediational pattern may explain contradictory findings in the literature about the relative importance of either TB or PB in suicide. For example, studies reporting a more robust role for PB over TB (Puzia et al., 2014; Wilson et al., 2017) may reflect a point by which an individual's feelings of PB have overwhelmed the initial experience of TB which caused the sense of PB to emerge.

As discussed in chapter 1, there is a paucity of literature examining how TB and PB relate to each other (Ribeiro & Joiner, 2009; Van Orden, 2014). Overall, findings from this research question help resolve ambiguities around the nature of the relationship between TB and PB (see Chapter 1) and contribute to knowledge in two ways. Firstly, the systematic review of the empirical literature (see chapter 2) showed that most previous research has reported a strong association between TB and PB (see for instance Rogers et al., 2016; Gallyer et al., 2018). However, these studies rely on correlational accounts and are therefore unable to consider any causal connection between the constructs. Findings from the current study extend current knowledge to reveal an association between TB and PB as part of a mediational analysis which shows that feelings of TB may lead to a sense of PB.

Secondly, despite an increasing body of research about the IPTS, there is little understanding of the relationships between any of its constructs (Hjelemend & Knizek, 2020; Ribeiro & Joiner 2015). In addition to confirming a relationship between the constructs, results from the current study show that they operate in a sequential manner such that TB emerges before PB. Developing a causal pathway from depression to suicidal behaviours (such as depression leads to TB which leads to PB which in turn causes active suicidal thoughts) helps refine clinical understanding of suicidal risk as well as identify areas for early therapeutic intervention (this is discussed further in the implications section).

Question 5: Does Hopelessness Mediate the Relationship between TB and PB?

Hopelessness is a key component in several theoretical models of suicide (see for instance: Abramson et al., 1998; Beck et al., 1975; Schotte & Clum, 1987), and previous literature has confirmed its empirical relationship to suicidal behaviour (Beck et al., 1990; Klonsky et al., 2012). However, the IPTS does not clearly define hopelessness as an independent construct within its theoretical model (see Chapter 1 for further details). As a result of this ambiguity, results from studies examining how hopelessness influences suicidal risk in the context of the IPTS constructs, are mixed (see Chapter 2 for a full discussion). It has been argued that hopelessness specific to the states of TB and PB should be considered as an independent construct within the theory (Mandracchia et al., 2019; Tucker et al., 2018). In contrast, Kleiman et al., (2014) propose that a more general sense of hopelessness influences suicidal behaviour indirectly through its effect on TB and PB. This question therefore aimed to understand what role (if any) hopelessness plays in influencing the emergence of TB, PB and suicidal behaviour. To investigate this, the mediational effect of hopelessness on the relationship between TB and PB was analysed within the wider context of the relationship between depression (as the independent variable) and suicidal behaviour (as the dependent outcome variable).

Results from the current study proposed three principal findings about the role of hopelessness in suicidal behaviour. Firstly, at all three levels of suicidal behaviour the regression of TB onto hopelessness was significant suggesting that hopelessness seems to emerge from feelings of TB. This is in line with previous research which reports that TB is predictive of future feelings of hopelessness (Roeder & Cole, 2019), and that loneliness is an important predictor of hopelessness in models of suicide risk (Chang et al., 2010). However, in contrast, Joiner and Rudd, (1996) reported that loneliness was a consequence rather than a contributory factor of hopelessness. This may be explained by the differing methodological approaches employed by studies when investigating the role of hopelessness. Joiner and Rudd, (1996) used a measure of general hopelessness, however the current study used a suicide-specific measure of hopelessness suggesting that it is situation specific

thoughts of hopelessness which may be most important in understanding suicidal behaviour (Bryan et al., 2014; Tucker et al., 2018)

Secondly, in the groups experiencing more serious forms of suicidal behaviour (active suicidal thoughts and potentially lethal suicide attempts) the regression of hopelessness onto PB was significant suggesting that in these groups, PB emerges from a sense of hopelessness. This finding proposes a causal pathway such that (when considered in conjunction with findings from questions 3 and 4), depression leads to TB, which in turn leads to experiences of hopelessness, which triggers feelings of PB, which in turn leads to more serious forms of suicidal behaviour (active suicidal thoughts and potentially lethal suicide attempts). These findings suggest that once someone feels hopelessness about their future, they may start to perceive themselves as being a burden on others. This could occur in response to negative beliefs about one's future ability to contribute equally to interpersonal relationships. Previous research has proposed such a relationship between PB and hopelessness. Nalipay and Ku, (2018) found that PB mediated the relationship between hopelessness and depression. In addition, hopelessness has been found to result in higher levels of interpersonal stress (including components of PB) (Joiner et al., 2005). However, results from the current study extend this understanding by characterising hopelessness as the mechanism by which TB leads to PB. This finding answers the question raised by research question four about the origins of PB and in doing so, establishes a causal pathway such that depression leads to TB, which causes hopelessness, which in turn generates PB which then results in either active suicidal thoughts or potentially lethal suicide attempts.

The third key finding showed that hopelessness alone mediated the relationship between depression and potentially lethal suicide attempts confirming that it can also act as an independent causal construct in the development of serious suicidal behaviour. This indicates that hopelessness seems to become an increasingly pervasive state of mind as the severity of suicidal experience increases. This finding adds to the consensus amongst suicide researchers that hopelessness represents a prominent and immediate clinical warning sign of potentially serious suicidal

behaviour (Rudd et al., 2006). Furthermore, in confirming that the dominance of hopelessness increases as the severity of suicidal behaviour increases, this study's findings support the assertion that hopelessness is an important indicator of future serious suicidal potential in people initially presenting with suicidal ideation (Beck et al., 1990; Beck et al., 1985).

As discussed in Chapter 1 section 4, the role of hopelessness is not currently well defined within the IPTS and the surrounding literature is characterised by debate about what hopelessness specifically represents (see for instance Joiner, 2005 and Van Orden et al., 2010). Most empirical research operationalises hopelessness as a general trait-based measure (see Anestis et al., 2015; Hom et al., 2017), and there is therefore limited opportunity to understand the type of hopelessness which may be most important in influencing suicidal behaviour. In terms of the overall research question ('Does Hopelessness Mediate the Relationship between TB and PB?'), results seem to suggest that hopelessness emerges from thoughts of TB and goes on to trigger a sense of PB. In more serious forms of suicidal behaviour, hopelessness appears to operate independently of TB and PB. These findings extend current knowledge in two ways.

Firstly, previous studies have focussed on interaction effects between hopelessness and TB or PB (Van Orden, 2014; also see Chapter 2 for further discussion) and have therefore been unable to specify how hopelessness may operate in conjunction with both IPTS constructs to influence the risk of different types of suicidal behaviour. Results from the current study suggest that feelings of hopelessness act as a mechanism in the evolution of PB from a sense of TB. This specifies the role of hopelessness in the development of different degrees of suicidal behaviour, and furthers understanding of the inter-relationship between TB and PB.

Secondly, most previous research assumes that hopelessness relates to a general trait-based predisposition to negative thinking about the future. However, findings from the current study show that hopelessness seems to emerge from feelings of TB. This

suggests that it is hopelessness specific to one's own interpersonal circumstances which is important in the formulation of suicidal behaviour.

Question 6: Does the IPTS Construct of AC help Predict Suicide Attempts?

As discussed in Chapter 1, the IPTS hypothesises that the process of making a suicide attempt requires intent and that this is formulated through holding or developing a capability for suicidal behaviour (Joiner, 2005; Van Orden et al., 2010). Nearly all empirical studies rely on one of various versions of the ACSS (Van Orden et al., 2008) to quantify levels of suicidal capability. However, inconsistent findings about the underlying factor structure of the scale (Rimkeviciene et al., 2017; Smith et al., 2013) have resulted in concerns that it may not accurately reflect the construct as described by the IPTS (Ribeiro et al., 2014). The sixth research question therefore aimed to understand whether the IPTS construct of AC is helpful in predicting the risk of suicide attempts. This was explored in two ways: (i) analyses sought to determine which items of the scale were specifically associated with suicidal risk, and (ii) of these items whether any helped predict specific levels of suicidal behaviour.

Results from correlational analyses involving each item of the ACSS-20 demonstrated that eight items were associated with overall suicidal risk. These findings appear to support the premise that some items on the ACSS scale may be of limited use in predicting suicide risk. In particular, seven of the eight items were related to either a general sense of fearlessness or a specific fearlessness about death, whereas only one item about pain tolerance was found to be associated with suicidal risk. This strengthens findings from previous studies which have proposed concerns about the validity of the ACSS in assessing suicidal capability. In a revision to the original scale, Ribeiro et al., (2014) noted that items related to exposure to provocative and painful events were redundant in assessing the presence of a suicidal capability and therefore removed these items from the scale. The authors argued that this approach represented a more valid approach in assessing acquired capability.

Following parallel mediation analysis with the eight items of the ACSS as mediators of the relationship between depression and each level of suicidal behaviour, three points of interest can be discussed. Firstly, as expected, AC seems to have no role in triggering suicidal ideations. This is consistent with the IPTS assertion that AC alone is not sufficient to increase suicide risk (Van Orden et al., 2010; Van Orden et al., 2008).

Secondly, one item ("I could kill myself if I wanted to") seemed to be important in the transition from passive ideations to active thoughts, and particularly in the development of active suicidal plans. This finding is in accordance with the IPTS which says that an element of AC is required in order to enable an individual to start planning suicide. However, the current study suggests that it's a readiness to die that's important rather than a reduced fear of death as described by the IPTS. This may reflect an awareness or acceptance among those experiencing suicidal desire that death by suicide is a potential course of future action. Once this option is recognised, an individual is increasingly likely to move from passive thoughts of suicide towards active planning and a state of mind that is increasingly ready to die. In support of these findings, previous studies have reported that a readiness to die is associated with suicidal plans (George et al., 2016) and that "resolved plans and preparation" are important to predicting more serious forms of suicidal behaviour (Chu et al., 2015; Witte et al., 2006).

Thirdly, two items ("I could kill myself if I want to" and "I am not afraid to die") mediated the relationship between depression and suicidal behaviour. It therefore appears that suicidal risk is greatly enhanced in the presence of two elements: a readiness to die (which triggers the transition from suicidal ideation to active planning), and a fearlessness about death (which enables the transition from active suicidal planning to making a suicide attempt). These findings help explain studies which reported no or weak associations between fearlessness about death and suicide attempts (Khazem & Anestis, 2016; Smith et al., 2016), as its only in conjunction with a readiness to die that a reduced fear of death results in serious suicidal behaviour. In addition, findings extend those of Gutierrez et al., (2016) who

identified a fearlessness about one's own death (as represented by the item "I am not afraid to die") as the most important indicator of suicide risk by establishing its influence in the most serious forms of suicidal behaviour.

Previous research has reported inconsistent findings about the role of AC in suicide attempts (see chapter 2). Findings from the current study confirm that two aspects of AC are meaningful in explaining different levels of suicidal behaviour (a readiness to die and a fearlessness about death). This progresses our understanding of AC in two ways. Firstly, the IPTS does not include any cognitive thought process in its conceptualisation of AC. However, the current study shows that a 'readiness to die' influences the transition from passive suicidal ideations to active suicidal thoughts. It therefore seems that personal thoughts and beliefs representing an acceptance of one's own death may represent an important but overlooked component of AC.

Secondly, there is an established evidence base linking a fearlessness about death to suicidal behaviour (Ribeiro et al., 2014; Chu, Podlogar et al., 2016). However, literature explaining how a reduced fear of death may increase the risk of suicide attempts is limited. Results from the current study confirm fearlessness about death to be an important component of AC. They also further this by proposing that it is a fearlessness about death combined with a readiness to die which influences an individual's transition from active suicidal thoughts to potentially lethal suicide attempts.

IMPLICATIONS

Findings from the current study have an impact on three areas of policy and practice: (i) suicidal risk assessment; (ii) public education about suicide awareness, and (iii) therapeutic treatment for suicidal behaviour.

Implications for Clinical Risk Assessment of Suicidal Behaviours

Suicide risk assessment tools are used to help predict the likelihood of future suicidal behaviour occurring. Improving the ability to identify who is at most risk allows the more effective targeting of early intervention to help prevent such behaviours. There is widespread variation in current approaches to assessing risk in clinical settings. Risk assessment in primary care (such as in General Practice) often takes the form of screening based on validated scales (e.g. the Patient Health Questionnaire; PHQ-9; Kroenke and Spitzer, 2002). In more specialist mental health provision such as that provided in acute and community settings, an assessment of risk may be formulated which takes into account a broader set of factors including demographic characteristics and current or previous mental health diagnoses. Despite their differences, these approaches are united by: (i) their foundation on identifying disparate but widely established factors associated with suicide, and (ii) their aim of categorising risk into levels (e.g. low, medium, high). This has resulted in tools which identify large groups of people who may be at risk without the specificity required to understand who is actually at risk (Na et al., 2018; Runeson et al., 2017). For instance, many identified as “high risk” do not go on to develop suicidal behaviours while some of those classed as “low risk” eventually die by suicide (Large et al., 2017). It has therefore been argued that current approaches do not provide sufficient clinical utility for informing treatment (Carter & Spittal, 2018; Large & Ryan, 2014).

Results from the current study demonstrate that TB emerges prior to feelings of PB. This suggests that social factors which influence TB (such as loneliness, or social isolation) can act as early indicators of future suicide risk. It also appears that PB is associated only with more serious forms of suicidal behaviour. Factors related to PB

(such as low self-esteem and a flawed sense of self) may therefore represent warning signs of serous suicide risk which require more immediate attention. Additionally, in terms of a capability for suicidal behaviour, results showed that a readiness to die differentiated the risk of experiencing active suicidal thoughts from passive suicidal ideations, and that being ready to die in combination with a reduced fear of death differentiated the risk of potentially lethal suicide attempts from active suicidal thoughts.

Using findings about the distinct roles of the IPTS constructs in suicidal behaviour has two important implications for suicide risk assessment practices. The first relates to early identification of suicidal potential (mainly suicidal thoughts) which generally takes place in primary care settings or as part of eligibility assessments for access to tertiary and specialist mental health services. Assessment in these areas should include aspects which consider an individual's perceptions of their social support and factors related to their self-esteem. For instance, alongside using single item measures of recent suicidal ideation (e.g. PHQ-9; Kroenke and Spitzer, 2002), GP's could include a brief evaluation of an individual's perceptions of their social context to help understand the likelihood of developing either TB or PB and therefore future suicidal behaviour. This could take the form of general screening questions about an individual's social support and social interaction. Instances where individuals present with apparent difficulties in interpersonal relationships (such as those with no close family, or those experiencing a close relationship breakdown) could indicate a future risk of social isolation and feelings of TB. Cases where an individual may have experienced a change in circumstance which effects their ability to support others (e.g. a recent job loss or illness), may help identify those at risk of developing low self-esteem, future PB and a risk of experiencing more serious suicidal behaviour.

The second implication relates to improving risk assessment in inpatient care services. Suicidal risk assessment in mental health hospitals has a profound effect on a range of issues which impact on an individual's level of restriction, and in turn, their psychological wellbeing. For example, for those detained under the Mental Health Act, their immediate and future risk of suicide contributes to decisions about

their access to community leave, the level of observations they are subject to, and the extent of their future discharge planning. A more effective system, able to differentiate between levels of risk would therefore help multi-disciplinary teams maintain the safety of those most at risk (those at risk of potentially lethal suicide attempts) while ensuring that everyone is treated under the least restrictive option (those at risk of less serious suicidal behaviour could still benefit from supervised community leave for instance). One way to achieve this would be to differentiate risk levels by adapting current inpatient assessments (which focus on mental state and previous self-harming behaviour, and which have been shown to be of limited predictive utility, Large et al., 2011) to include measures of: (i) an individual's readiness to die (which indicates an ability to actively plan for suicide) and (ii) their fearlessness about death (which when combined with suicidal readiness indicates heighten risk of suicide attempt).

Implications for Public and Professional Education about Suicidal Behaviours

Public awareness of suicide is an important tool in suicide prevention, not least because around a quarter of those who die by suicide have had no previous contact with mental health services in the year before their death (Luoma et al., 2002). Current understanding about suicide amongst the general public reflects health promotion campaigns which tend to focus on increasing awareness of suicide in specific groups of the population (see for instance the "Choose Life" campaign aimed at raising awareness of suicide in men; Robinson et al., 2014). Although successful in raising awareness, such campaigns have resulted in some commonly held misconceptions about suicide. In particular, there are generally held views that: (i) suicide exists along a continuum of behaviours of escalating severity which starts with depression, and (ii) that only certain groups are vulnerable to suicide. Amongst clinical practitioners, understanding about suicide tends towards an emphasis on discrete diagnostic categories as indicative of risk, and has resulted in a general view that suicide prevention is best achieved through medical means primarily targeting feelings of depression. Although a shift towards a more psychosocial view of mental health problems is emerging (see for example the Power Threat Meaning Framework; Johnstone & Boyle, 2018), understanding about suicide amongst some

groups of practitioners still defaults to assumptions about risk related to psychiatric diagnosis.

The current study's findings confirm the widely held belief that depression is related to suicidal behaviour. However, it was also found that the IPTS constructs represent more proximal risk factors and are therefore important in determining under what circumstances those experiencing depression may go on to develop suicidal behaviours. In addition, results demonstrated that the role of each IPTS construct differed according to the severity of suicidal behaviour experienced. This suggests that viewing suicide as a spectrum of dynamic behaviours which occur in response to a particular set of social circumstances may represent a more useful understanding than one based on rigid categories involving demographic characteristics or mental health diagnoses.

Adopting a public health approach to suicide which promotes an understanding of suicidal behaviour based on the IPTS model has important implications for suicide prevention policies at two levels. Firstly, at an individual level, delivering education campaigns which explain the contribution of TB, PB and hopelessness to suicidal behaviour could help increase self-awareness about the relationship between an individual's own social circumstances and their mental health. For example, information describing the importance of social connection as a protective factor in suicide may prompt people to review the quality of their own social relationships with others and identify areas where this could be strengthened. The potential benefits of this are two-fold. It empowers people where possible to recognise and take responsibility for their own mental health and vulnerability to suicide and take steps to help improve their own interpersonal situation with less reliance on medical intervention. It also helps people to recognise their role in forming and maintaining social relationships with those around them (such as isolated family members) to help prevent the generation of suicidal behaviours in others.

Secondly, developing a community based conscious awareness about the importance of interpersonal contributors to the IPTS constructs in each level of suicidal

behaviour will help shift the current focus away from a general acceptance that the progression from depression and suicidal ideations to suicide attempts is inevitable. For example, educating people about the role of self-esteem in developing PB and increasing risk of future suicidal behaviour may result in more effective strategies for building or protecting self-esteem in schools or amongst those working with children and young people who are experiencing bullying.

Implications for Therapeutic Treatment of Suicidal Behaviours

Current treatments for treating suicidal symptoms in primary care and community services rely heavily on pharmacological approaches (such as the administration of anti-depressants or mood stabilisers) which aim to alleviate depression. In addition, individuals may be offered the opportunity to access talking therapies which similarly focus on providing a solution to feelings of depression. For those experiencing severe suicidal symptoms (usually those in in-patient care), more specialised treatments plans may include Cognitive Behavioural Therapy (CBT) and Dialectical Behaviour Therapy (DBT). However, despite the increasing preponderance of such treatment regimes, rates of suicidal behaviour in the UK have not decreased in the past five years (Office for National Statistics, 2020). This disconnect suggests that current approaches may be of limited efficacy in treating suicidal behaviour.

The current study confirmed the importance of an individual's interpersonal environment on suicide risk through its impact on TB and PB. As TB is the first IPTS construct to emerge from depression, it represents an ideal area for early intervention to help prevent future generation of PB and more serious forms of suicidal behaviour. Where a sense of PB is already present, findings indicate that strategies which target self-esteem and sense of self may be most effective in reducing the risk of active suicidal thoughts or suicide attempts. Furthermore, hopelessness appears to become an increasingly pervasive force which intensifies the severity of suicidal behaviours over time, which suggests that reducing feelings of

hopelessness should therefore represent an important feature of longer-term treatment strategies.

Findings from the current study suggest that clinical practice should place a greater emphasis on psychosocial forms of treatment, management and care. This requires an approach which seeks to understand each individual's experience in the context of their surrounding interpersonal environment. In terms of helping reduce and prevent suicidal ideations, such interventions could focus on improving access to social opportunities to encourage the formation of more meaningful interpersonal relationships, thereby increasing feelings of social connectedness. This proposes a greater role for social workers, health visitors and community nurses in delivering therapeutic benefit through opportunities such as social clubs, informal interest groups, and where possible, tailored individual social support to those most at risk of social isolation. Similarly, in terms of helping reduce and prevent more serious suicidal thoughts and behaviours, therapeutic attention could be directed towards building avenues to enhance self-image and perceived value to others. This could take the form of individual therapy-based solutions for improving self-esteem but could also involve social workers helping improve access to opportunities for people to contribute to others (such as through paid or voluntary work placements). Support for those experiencing chronic and enduring suicidal thoughts may include longer-term management of feelings of hopelessness to help reduce the escalation towards suicide attempts. For example, clinical practitioners could deliver psychological interventions which encourage people to think in positive terms about their future. This could be achieved through setting beneficial and achievable goals for the future and providing appropriate support to help individuals meet them. Goals which emphasise outcomes related to positive social outcomes and enhanced self-esteem are likely to be most advantageous in reducing feelings of interpersonal hopelessness and could include targets around attending local community support groups, organising social events with others or joining relevant online communities.

CONCLUSION

This chapter has discussed findings from the current study in relation to six research questions which were generated in response to challenges raised by reviewing the theoretical and empirical literature surrounding the IPTS model of suicide. Findings from this study propose implications for clinical practice in terms of suicidal risk assessment and therapeutic intervention, as well as for public and professional education. Recommendations are intended to help improve wider understanding about the circumstances under which suicidal behaviours may develop with a view to enhancing prevention practices.

In the next section, this thesis will conclude with a consideration of the strengths and weaknesses associated with the current study and propose potential directions for future research.

CONCLUSION

This study aimed to test whether the IPTS constructs (TB, PB hopelessness, and AC) represent an effective model for predicting three types of suicidal behaviour (passive suicidal ideations, active suicidal thoughts and potentially lethal suicide attempts). In order to achieve this, six research questions were developed in response to challenges raised by a review of the theoretical and empirical literature surrounding the IPTS theory. The six research questions were:

1) Do the IPTS constructs (TB, PB and hopelessness) represent general predictors of mental health distress or are they specific predictors of suicidal risk?

2) Do the IPTS constructs (TB, PB and hopelessness) remain important predictors of risk when compared with the more traditional, well established epidemiological (age, sex, and relationship status) and psychopathological (depression and anxiety) risk factors already known to influence suicidal behaviour?

3) Do the IPTS constructs (TB and PB) function as proximal risk factors (mediators) between depression and suicidal behaviour?

4) Are the IPTS constructs (TB and PB) related to each other?

5) Does hopelessness mediate the relationship between TB and PB?

6) Does the IPTS construct of AC help predict suicide attempts?

This research concludes by: (i) discussing the strengths of the findings in terms of advancing knowledge about suicidal behaviour; (ii) considering the key limitations associated with the study, and (iii) proposing directions for future research.

Research Strengths

The findings from this study contribute to understanding about the influence of IPTS constructs on suicidal behaviour in four ways. Firstly, they confirm that the IPTS represents a predictive model of suicide. It is clear from the findings that the IPTS constructs (TB, PB and hopelessness) act as indicators specific to suicidal risk rather than general mental health distress and that they account for more variance in suicidal risk than traditional risk factors based on demographic characteristics (age, sex, relationship status) or mental health difficulties (depression, anxiety, self-harming behaviour.

Secondly, TB and PB, and their joint combination, seem to have very specific roles to play in the prediction of suicidal behaviours. It is important to note for instance that TB has an important influence on early passive ideations whereas PB becomes more prominent in more serious forms of suicidal behaviour. Furthermore, findings from the current study suggest that TB emerges from depression but that there is no such relationship between PB and depression.

Thirdly, it appears that hopelessness acts as a very pervasive influence to influence suicidal behaviours. Findings show that its influence is linked to the IPTS constructs in that it seems to emerge from TB to influence the development of either PB or more serious forms of suicidal behaviour. It also appears that as it becomes an increasingly pervasive state of mind, it acts as a direct influence, independent from TB and PB, on increasing the risk of experiencing potentially lethal suicide attempts.

Fourthly, acquired capability seems to be important to predicting suicidal risk, but only two components were associated with suicide attempts – a readiness to die and a fearlessness about death. It seems that a readiness to die is indicative of the transition from passive suicidal ideations to active suicidal thoughts, and this in conjunction with a fearlessness about death, confers a heightened vulnerability of experiencing potentially lethal suicide attempts.

Research Limitations

Findings from the current study are limited by three key factors. Firstly, the study's sample was drawn from several populations. This included university undergraduates, members of the general community, and people selected due to their higher propensity to experience suicidal behaviours (such as those with mental health or developmental difficulties). Although this strategy facilitated the collection of a dataset which was sufficiently large enough to analyse differences between suicidal groups, findings may not be truly representative of either general or clinical populations.

Secondly, this study focussed on hopelessness in terms of a suicide specific state of mind by using responses to a single item on the Suicidal Behaviors Questionnaire-Revised ("How likely is it that you will attempt suicide one day?"). This produced a narrow measure of an individual's self-perceived likelihood of experiencing a future suicide attempt. However, using broader measures of hopelessness such as a general measure of trait-based hopelessness (such as the Beck Hopelessness Scale; Beck et al., 1974) or a specific measure of state-based hopelessness (such as the Interpersonal Hopelessness Scale; Tucker et al., 2018) would allow for the analysis of any mediational effect of hopelessness in the relationship between TB and PB and would therefore help ascertain which aspects of hopelessness are most specifically related to the development of suicidal behaviours.

Thirdly, the measurement of acquired capability involved using the ACSS-20 which is based on the current theoretical conceptualisation of the construct as comprising of two components – fearlessness about death and an increased tolerance to pain (Van Orden, 2009). However, analyses of the psychometric properties of the ACSS suggest that the scale does not reflect such a two-factor structure (Smith et al., 2013; Rimkeviciene et al., 2017). The resulting uncertainty about both the theoretical composition of AC, and the validity of its measurement, therefore limit the extent to which findings from the current study can claim to have reliably and fully captured the construct of AC.

Directions for Future Research

Three areas may benefit from a further research focus. The first relates to the construct of hopelessness. It is clear from this study's results that hopelessness has a crucial role in contributing to an increased risk of experiencing all types of suicidal behaviour. However, it does not seem to occur directly in response to feelings of depression, emerging instead from TB. Furthermore, the strength of its role seems to increase in magnitude as the severity of suicidal behaviour increases. A thematic analysis of qualitative interview responses could therefore identify themes which explore the circumstances under which a sense of TB may result in hopelessness. Findings could help understand whether an underlying predisposition to a negative cognitive style confers a greater risk for developing suicide-specific hopelessness (as proposed by Joiner, 2005), or, whether a sense of hopelessness arises largely as a response to an individual's feelings about their current social status (as hypothesised by Van Orden et al., 2010).

The second proposes the importance of furthering understanding about AC. There is an indication from this study's findings that two components are important in developing an acquired capability for suicide: a readiness to die, and a fearlessness about death. However, little is known about how these states develop or go on to influence suicidal behaviour. In addition, as discussed in Chapter 2, current available measures for AC are constrained in their ability to validly and reliably measure the construct, further limiting our ability to explore these aspects of AC. Therefore, in order to develop a better understanding of AC, a different research approach is warranted. A readiness to die and a fearlessness about death are clearly deeply held, emotionally laden states of mind, likely resulting from a complex interplay of personal and environmental factors. Employing a qualitative interpretative phenomenological analysis concentrating on one or two people who have experienced suicidal attempts would enable a deeper, richer understanding about what it means at an individual level to experience these painful states. Findings from such studies could help form the basis for generating new hypotheses about the role of AC and in turn lead to future refinement of the IPTS theory.

Thirdly, it seems that the IPTS model provides an effective framework for understanding suicidal behaviour in an adult population formed in large part from those with developmental difficulties. However, exploring the mediational effect of the IPTS constructs in the relationship between depression and suicidal behaviours in other population groups would provide a greater endorsement of the model's clinical utility. One such group is those under the age of 18 years old. Suicide amongst adolescents aged 15-19 years old is an increasing concern with rates of death by suicide in the UK rising each year since 2010 (Bould, Mars, Lancet). Understanding the influence of IPTS constructs such as TB and PB on suicidal behaviours in this group could help identify potential areas for targeted therapeutic support.

Closing Thoughts

Findings from this study highlight the importance of interpersonal constructs such as TB, PB and hopelessness in mediating the relationship between depression and suicidal behaviour. These are states of mind which are amenable to change, particularly through positive social connections with others. It is hoped that the contribution of those who took part in this study will therefore help enhance our understanding about the ways in which each and every one of us can help maintain the psychological wellbeing of those around us and help prevent the onset of avoidable suicidal behaviours.

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LIST OF APPENDICIES

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APPENDIX 1: THE INTERPERSONAL-PSYCHOLOGICAL THEORY OF SUICIDE: A SYSTEMATIC REVIEW

METHODS

As set out in chapter 2, the systematic literature search aimed to understand the extent of empirical evidence about three main issues: firstly, the role of each IPTS construct in suicidality; secondly, how the IPTS constructs inter-relate with each other in the development of suicidality, and, thirdly, how the IPTS constructs influence suicidality in the presence of depression and hopelessness.

This appendix presents the methods used to carry out the literature search and will be organised around five sections. The first section describes the process by which the search was carried out. This includes details of the search terms and databases used. The second section looks at the inclusion and exclusion criteria which guided the eligibility for studies to be included in the review. The third section explains how the selection of studies was based around established guidelines. The fourth section considers how the quality of the studies was assessed using an appropriate framework. And the final section briefly describes the characteristics of the literature identified by the systematic review.

The Search Process

The systematic review of the literature searched for studies which investigated risk factors for suicide based on the constructs of the IPTS. Within these studies the search also considered whether studies considered the role of the IPTS constructs in in suicidality in the context of other established mental health difficulties including depression and hopelessness. The search was carried out between January and June 2019. The most relevant studies were found in databases covering literature within the disciplines of both psychology and nursing and included PsycINFO, PSYCarticles, Medline, Cinahl, and Academic Search Complete. A search for online literature was carried out using Google Scholar. A manual search involved examining the reference

lists of extracted articles to identify any additional relevant studies and searching for any unpublished work through the use of online library catalogues.

Table A1.1 summarises the search terms used during the systematic review.

Table A1.1

Key search terms used in the database search

Main Concept	Search term used	Location
Thwarted Belonginess	Thwarted belong*	Title Abstract
Perceived Burdensomeness	Perceived burden*	Title Abstract
Acquired Capability	Acquired capability	Title Abstract
Suicidality	Suicid*	Title Abstract

It can be noted from table A1.1, that the search terms used were based on the constructs of the IPTS. These were: Thwarted Belongingness, Perceived Burdensomeness, Acquired Capability and Suicide. Both titles, and abstracts were searched using these concepts. As the review aimed to specifically examine any interrelation between risk factors within the framework of the IPTS, no other search terms were included. Instead, the returned articles were sifted to identify any which examined interactions with the mental health risk factors of depression and hopelessness. The use of an Asterix (*) as a wildcard symbol enabled truncation searching whereby the search returned all studies containing different variations of the key search terms.

Study Eligibility

Studies returned using the search process described above were initially screened and retained if they met the general inclusion criteria. The initial screening involved analysing abstracts only. The general criteria required that studies: (i) were peer reviewed, (ii) were written in the English Language, (iii) empirically tested the relationship between either of the three key IPTS constructs and suicidality, (iv) were

accessible, (v) were published in 2014 or later, and (vi) included a sample size of N=150 or greater.

Studies published prior to 2014 were excluded on the basis that two previous reviews considered literature selected on similar terms to this review which covered the period from 2005 -2019 (see Ma et al., 2016; Chu, Buchman-Schmitt et al., 2017). This review therefore focussed on literature from the period 2014-2019. This review also excluded studies with sample sizes less than N=150 to minimise the likelihood of selection bias.

Following initial screening, full text articles were obtained and assessed for eligibility according to the inclusion and exclusion criteria. These criteria are set out at table A1.2.

Table A1.2

Inclusion/Exclusion Criteria for studies in the systematic review

Criteria	Include	Exclude
Study design	Studies presenting findings based on primary empirical data	Reviews and Meta-analyses
	Studies reporting the direct relationship between IPTS constructs and suicidality	Scale validation and factor analysis studies
		Studies reporting group differences in relationships between IPTS constructs and suicidality
Measurement of Variables	Studies with a dependent variable of suicidality	Studies which did not assess either suicidal ideation or suicidal behaviours

	Studies using a version of the INQ or ACSS	Studies using proxy measure of TB, PB and AC

Note. IPTS=Interpersonal-Psychological Theory of Suicide; TB=Thwarted Belongingness; PB=Perceived Burdensomeness; AC=Acquired Capability; INQ=Interpersonal Needs Questionnaire; ACSS=Acquired Capability for Suicide Scale.

There were no limits on the nature of sample populations and studies including people of any age or sex were included. This aimed to reveal results relevant to a wide range of different populations as well as enable any analysis of population-specific differences in findings. In terms of study methodology, designs which made it difficult to draw conclusions about the direct relationship between the IPTS constructs and suicidality were excluded. This resulted in specific exclusion criteria relating to literature reviews and meta-analyses (as these could result in duplication of findings), studies comparing only groups differences in relationships between the IPTS and suicide, and studies which concerned assessing the psychometric reliability of scales and measures.

As can be noted from table A1.2, there were inclusion and exclusion criteria relating to how the variables were assessed. Studies were eligible for inclusion in the systematic review only if they observed suicidality (including either SI or suicidal behaviours) as the dependent variable. The assessment of the IPTS constructs was also subject to the inclusion and exclusion criteria since only studies which used either the Interpersonal Needs Questionnaire (INQ; Van Orden, 2009) to assess TB and/or PB or the Acquired Capability for Suicide Scale (ACSS; Van Orden et al., 2008) to measure AC were included in the review. This criterion enabled the review to compare equivalent findings between different studies which may otherwise have been difficult if a variety of different measures of the IPTS constructs were used. As the INQ and the ACSS are specifically associated with and developed by the founders of the IPTS, this criterion also ensured that studies were directly concerned with understanding the IPTS helping to keep the search focussed.

Selection of Studies

The selection of studies was based on Preferred *Reporting Items for Systematic Reviews and Meta-analyses (PRISMA; Moher et al., 2009)* and a flow diagram recording the study selection in this review can be found at figure A.1. In total 319 articles were initially identified, of which 108 were duplicates. A further 4 were not accessible, 57 were published prior to 2014 and 14 included a sample size of less than N=150. This resulted in 136 articles to be considered for a full text review in line with the inclusion and exclusion criteria.

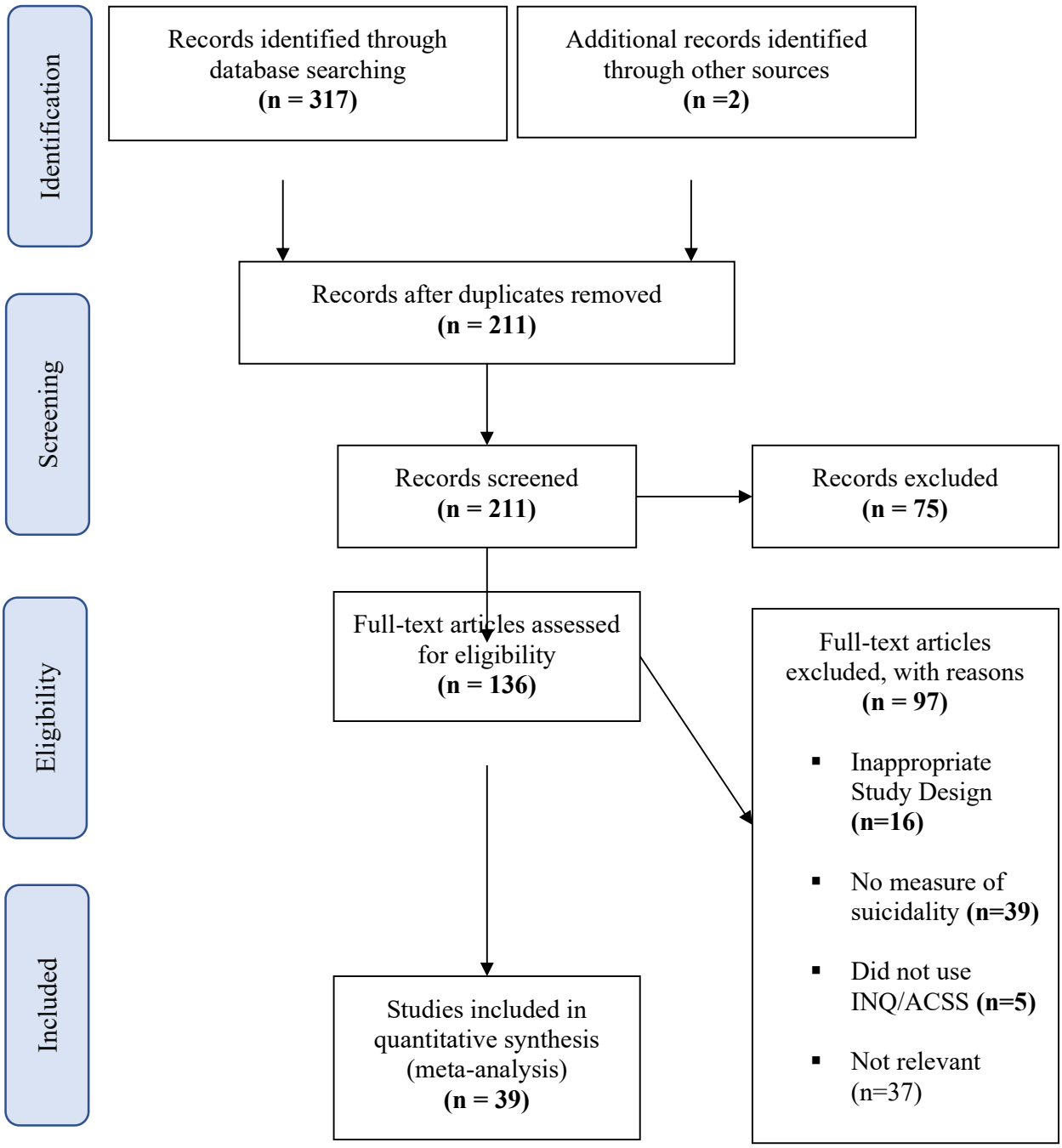
The 136 remaining articles were reviewed and a total of 97 were excluded according to the terms of the inclusion and exclusion criteria. The exclusions fell into four broad categories. Firstly, the category containing the largest number of excluded studies (N=39) related to the lack of a direct or discrete measure of suicidality. This included studies which observed effects between the IPTS constructs but which did not consider their influence on suicidality and those which considered particular IPST constructs in relation to other epidemiological and mental health factors (such as age, sex or depression).

Secondly, 37 articles were excluded on the basis that they were not relevant or did not contain data which was relevant to understanding the empirical relationship between the IPTS constructs and suicidality. These studies mainly included investigations about the role of non-IPTS variables (such as depression or previous clinical diagnoses) in suicide and contained no relevant empirical data about the association between TB, PB or AC with suicidality.

Thirdly, 16 articles were excluded as they contained study designs which limited the ability to identify empirical relationships between the key variables. These included studies which assess the reliability and validity of psychometric scales using techniques such as factor analysis, or studies which involved whole literature reviews and meta-analyses.

Figure A1.1

PRISMA Flow Diagram



Note. PRISMA flow diagram taken from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and MetaAnalyses: The PRISMA Statement.

Finally, there were 5 articles which did not use the INQ or ACSS to assess the IPTS constructs and which were therefore excluded from this review. These studies used proxy measures for TB, PB and AC which measures aspects of the IPTS constructs including social connectedness, perceived emotional support and history of multiple suicide attempts.

Quality assessment of studies

In order to assess the quality of the 39 studies identified from the systematic review process, the assessment framework developed by Caldwell et al., (2011) was used. This framework was established as a tool to facilitate the critique of health research mostly within the field of nursing. It is based on common features of other evaluation tools which have then been synthesised and modified so that the framework may be applied to both quantitative or qualitative research.

The questions used to assess the quality of the studies can be found at table A1.3. It can be noted from table A1.3 that the assessment framework contains 17 items which question specific aspects of the research including its rationale, its design, its analytic strategy and the quality of its conclusions.

Table A1.3

Framework used for assessing quality of research (Caldwell, Henshaw and Taylor, 2011).

1.	Does the title reflect the content?	The title should be informative and indicate the focus of the study. It should allow the reader to easily interpret the content of the study. An inaccurate or misleading title can confuse the reader.
2.	Are the authors credible?	Researchers should hold appropriate academic qualifications and be linked to a professional field relevant to the research.

3.	Does the abstract summarize the key components?	The abstract should provide a short summary of the study. It should include the aim of the study, outline of the methodology and the main findings. The purpose of the abstract is to allow the reader to decide if the study is of interest to them.
4.	Is the rationale for undertaking the research clearly outlined?	The author should present a clear rationale for the research, setting it in context of any current issues and knowledge of the topic to date.
5.	Is the literature review comprehensive and up-to-date?	The literature review should reflect the current state of knowledge relevant to the study and identify any gaps or conflicts. It should include key or classic studies on the topic as well as up to date literature. There should be a balance of primary and secondary sources.
6.	Is the aim of the research clearly stated?	The aim of the study should be clearly stated and should convey what the researcher is setting out to achieve.
7.	Are all ethical issues identified and addressed?	Ethical issues pertinent to the study should be discussed. The researcher should identify how the rights of informants have been protected and informed consent obtained. If the research is conducted within the NHS then there should be indication of Local Research Ethics committee approval.
8.	Is the methodology identified and justified?	The researcher should make clear which research strategy they are adopting, i.e. qualitative or quantitative. A clear rationale for the choice should also be provided, so that the reader can judge whether the chosen strategy is appropriate for the study.
9.	Is the study design clearly identified, and is the rationale for choice of design evident?	The design of the study, e.g. survey, experiment, should be identified and justified. As with the choice of strategy, the reader needs to determine whether the design is appropriate for the research undertaken
10.	Is there an experimental hypothesis clearly stated? Are the key variables clearly defined?	In experimental research, the researcher should provide a hypothesis. This should clearly identify the independent and dependent variables, and state their relationship and the intent of the study. In survey research the

		researcher may choose to provide a hypothesis, but it is not essential, and alternatively a research question or aim may be provided.
11.	Is the population defined?	The population is the total number of units from which the researcher can gather data. It maybe individuals, organisations or documentation. Whatever the unit, it must be clearly identified.
12.	Is the sample adequately described and reflective of the population?	Both the method of sampling and the size of the sample should be stated so that the reader can judge whether the sample is representative of the population and sufficiently large to eliminate bias.
13.	Is the method of data collection valid and reliable?	The process of data collection should be described. The tools or instruments must be appropriate to the aims of the study and the researcher should identify how reliability and validity were assured.
14.	Is the method of data analysis valid and reliable?	The method of data analysis must be described and justified. Any statistical test used should be appropriate for the data involved.
15.	Are the results presented in a way that is appropriate and clear?	Presentation of data should be clear, easily interpreted and consistent.
16.	Is the discussion comprehensive?	Whatever the mode of presentation the researcher should compare and contrast the findings with that of previous research on the topic. The discussion should be balanced and avoid subjectivity.
17.	Is the conclusion comprehensive?	Conclusions must be supported by the findings. The researcher should identify any limitations to the study. There may also be recommendations for further research, or if appropriate, implications for practice in the relevant field.

Each study was assessed against each quality criterion and was rated as 0 if the criterion was not met; 1 if the criterion was partially met, and 2 if the criterion was fully met. The overall quality assessment rating of each study was calculated using the total score of the 17 quality criteria, so that each study had a final score between 0 and 34. Studies demonstrating scores below the midpoint (under 17) were excluded from the review as not reaching a sufficient enough level on terms of quality and research rigour.

Table A1.4 sets out the results of the quality evaluation. It can be seen from table A1.4, that the total quality scores for the 39 studies ranged from 20 to 33, with a mean score of 29.5. 22 of the 39 studies demonstrated quality scores which were above the average indicating a generally high level of quality among the studies selected for the review. There were no papers which scored below the mid-point and consequently no papers were excluded through the quality assessment process.

Table A1.4

Quality Assessment Scores of Studies Included in Systematic Review using Framework by Caldwell, Henshaw and Taylor, (2011)

Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
Acosta et al. (2017)	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	**32**
Allbaugh et al. (2017)	1	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	**31**
Anestis et al. (2015)	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2	**31**
Baams et al. (2015)	1	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	**31**
Burke et al. (2016)	1	2	2	1	2	2	2	1	2	2	2	1	2	2	2	2	2	**30**
Burke et al. (2018)	2	2	2	2	2	2	1	1	1	2	1	1	2	2	2	2	2	**29**
Campos & Holden (2016)	1	2	1	1	2	2	1	1	2	2	2	1	2	2	2	2	2	**28**
Chang et al. (2017)	1	1	1	1	1	1	1	1	0	1	1	2	1	2	1	2	2	**20**
Chu, Buchman-Schmitt, Hom et al. (2016)	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	**32**
Chu, Podlogar et al. (2016)	2	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	**31**
Chu, Hom et al. (2017)	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	**32**
Chu, Hom et al. (2018)	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	**33**
Chu, Rogers et al. (2018)	2	2	2	2	1	1	1	2	2	2	2	1	2	2	2	2	2	**30**
Cramer et al.(2016)	1	2	1	2	2	2	1	1	2	2	1	1	2	2	2	2	2	**28**
DeShong et al. (2015)	1	2	2	2	2	2	1	1	2	1	1	1	2	2	2	2	2	**28**
Fink-Miller (2015)	2	2	2	2	1	1	1	2	2	1	2	2	2	2	1	2	2	**29**
Gallyer et al. (2018)	2	2	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	**32**
Gauthier et al. (2014)	1	2	2	2	2	2	0	1	2	2	1	1	2	2	2	2	2	**28**
Hawkins et al. (2014)	2	2	2	2	2	2	1	1	2	2	1	2	2	1	2	2	2	**30**

Hom et al. (2017)	2	2	2	2	2	1	1	2	2	2	1	2	2	2	2	2	2	**31**
Jahn et al. (2015)	2	2	2	1	2	1	2	1	2	2	2	2	2	1	1	2	2	**29**
Khazem et al. (2015)	2	2	2	1	2	2	0	1	2	2	2	2	2	2	2	2	2	**30**
Kleiman et al. (2014)	1	2	2	2	2	2	0	1	2	2	2	2	1	2	2	2	2	**29**
Kwan et al. (2017)	2	2	1	1	1	2	1	1	2	0	2	1	2	2	2	2	2	**26**
Mbroh et al. (2018)	1	2	2	2	1	2	1	1	2	2	2	2	2	2	2	2	2	**30**
O'Keefe et al. (2014)	2	2	2	2	2	1	2	1	2	2	2	2	2	1	2	2	2	**31**
Pelton & Cassidy (2017)	2	2	2	2	2	1	1	1	1	2	1	1	1	2	2	2	2	**27**
Pennings et al. (2017)	1	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	**29**
Puzia et al. (2014)	1	2	2	2	2	2	2	1	2	2	2	1	2	2	2	1	1	**29**
Ribeiro et al. (2015)	1	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	**30**
Rogers et al. (2017)	2	2	2	2	2	2	1	2	1	2	2	1	2	2	2	2	2	**31**
Silva et al. (2017)	2	2	2	1	2	2	1	1	2	2	2	2	2	2	2	1	2	**30**
Suh et al. (2016)	1	2	2	2	1	1	1	1	2	2	1	1	2	2	2	2	2	**27**
Suh et al (2017)	2	2	1	2	1	2	0	1	2	2	2	2	2	2	2	2	2	**29**
Teismann et al. (2017)	1	2	1	2	1	2	1	1	2	1	1	2	2	2	2	2	2	**27**
Tucker & Wingate (2014)	1	2	1	2	1	2	1	1	2	2	2	1	2	2	2	2	1	**27**
Wilson et al. (2017)	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	**32**
Wolford-Clevenger et al. (2016)	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	**32**
Woodward et al. (2014)	2	2	2	1	2	2	1	1	2	1	2	2	2	2	2	2	2	**30**

Table A1.5

Summary of Studies included in the review

Study	Country	Study Design	Population	Sample size	Mean Age of sample[3]
Acosta et al. (2017)	USA	CS[1]	Hispanic adults	336	18.99
Allbaugh et al. (2017)	USA	CS	African American women	179	36.65
Anestis et al. (2105)	USA	CS	Military	934	27.05
Baams et al. (2015)	USA	P[2]	Sexual Minority adults	876	18.31
Burke et al. (2016)	USA	CS	Undergraduates	520	20.68
Campos & Holden (2016)	Portugal	CS	General Population	200	36.7
Chang et al. (2017)	Hungary	CS	College Students	195	21.02
Chu, Buchman-Schmitt, Hom et al. (2016)	USA	CS	Firefighters	863	37.3
Chu, Hom et al.(2017)	USA	P & CS	4 samples; undergraduates, psychiatric outpatients, firefighters, primary care patients	469; 352; 858; 217	19; 27; 37.3; 44.1
Chu, Hom et al. (2018)	USA	CS	Military	973	29.94
Chu, Podlogar et al.(2016)	USA	CS	Military	3377	29.92
Chu, Rogers et al. (2018)	USA	CS	Undergraduates	508	18.94
Cramer et al. (2016)	USA	CS	Undergraduates	572	20.14
DeShong et al. (2015)	USA	CS	Undergraduates	348	19.45
Fink-Miller (2015)	USA	CS	Physicians	419	53.81
Gallyer et al. (2018)	USA	CS	Firefighters	944	38.90
Gauthier et al. (2018)	USA	CS	Undergraduates	781	19.3
Hawkins et al. (2014)	USA	CS	Mental Health outpatients	215	26.47
Hom et al. (2017)	USA	CS	Military	937	38.23
Jahn et al. (2015)	USA	CS	Older adults	167	72.4
Khazem et al. (2015)	USA	CS	Military	903	27.06

Kleiman et al. (2014)	USA	P	Undergraduates	299	20.94
Kwan et al. (2017)	USA	CS	Undergraduates	602	19.68
Mbroh et al. (2018)	USA	CS	Adolescent clinical inpatients	289	14.88
O'Keefe et al. (2014)	USA	CS	American Indian students	171	23.06
Pelton & Cassidy (2017)	UK	CS	General Population	163	21.58
Pennings et al. (2017)	USA	CS	Military	935	27.05
Puzia et al. (2014)	USA	P	Undergraduates with experience of childhood abuse	189	22.02
Ribeiro et al. (2015)	USA	CS	Military	1208	30
Rogers et al. (2017)	USA	CS	Military	541	49.9
Silva et al. (2017)	USA	CS	Military	3428	29.92
Suh et al. (2016)	South Korea & USA	CS	Undergraduates	944	21.87
Suh et al. (2017)	South Korea	CS	Undergraduates	301	21.87
Teismann et al. (2017)	Germany	P	Clinical outpatients	236	38.1
Tucker & Wingate (2014)	USA	CS	Undergraduates	336	19.74
Wilson et al. (2017)	USA	CS	Pain outpatients	282	48.23
Wolford-Clevenger et al. (2016)	USA	CS	Undergraduates	502	18.8
Woodward et al. (2014)	USA	CS	Sexual minority adults	210	36.11

[1] CS: =Cross Sectional
[2]. P = Prospective
[3]. Mean age reported in years

APPENDIX 2: PARTICIPANT INFORMATION SHEET

Exploring risk and protective factors relating to thoughts and attempts to end own life in adults with and without Autism Spectrum Conditions (ASC).

Thank you for considering helping with this research project. Before you decide whether or not you wish to take part, please read this information carefully, and discuss it with others if you wish. Please contact the researchers if you have any questions about the study.

What is the purpose of this study?

This study aims to understand why individuals with and without a diagnosis of an Autism Spectrum Condition (ASC) may experience thoughts and attempts to end their life. This research will help inform new ways of supporting those with and without ASC, to prevent these difficulties.

This study is being carried out as part of a PhD research project. It will explore the thoughts and behaviours of adults with and without ASC, and individuals who have and have not experienced thoughts or attempts to end their own lives.

Why have I been invited to take part?

We need help from adults aged between 18 and 60 years old to take part in this study. You can take part regardless of whether you have an ASC or not, or whether you have or have not experienced thoughts or attempts to end your own life. You have been invited to take part as you are an adult who is eligible to take part in this study, or you have registered to receive information about research studies at Coventry University, or the University of Cambridge. We hope you are able to help us with this study.

Do I have to take part?

No, taking part is entirely voluntary, and you do not have to take part. You can stop the study at any time without giving a reason. You can also withdraw from the study, without having to give a reason, up to two weeks after you have participated. To do this, please send your password to the researcher Kathy Cook (cookk6@uni.coventry.ac.uk).

What does the study involve?

You will be asked to complete an anonymous online survey, you do not need to provide your name or any contact details. You will need a computer to access the online. You may wish to take breaks throughout the survey. You can exit the survey at any time, and come back and complete it later if you wish using the same computer. You can also return to previous questions or skip forward to questions using the 'next' and 'back' buttons at the bottom of each page.

You will be asked to complete up to 10 questionnaires which vary in length. These questionnaires will ask about you (your age, sex, living situation, diagnoses, likes and dislikes), your thinking style and behaviours (your reactions to wanting but not receiving things, your ability to switch between different tasks, the strength of your hearing and sense of smell and your thoughts on death), any experiences of self-harm or thinking about or attempting to end your life, and reasons for thinking about or trying to end your own life. This will take approximately 1 hour. It may take slightly longer or shorter depending on your responses to individual questions.

What are the risks associated with taking part?

Most of the questions in this study are not about thoughts or attempts to end your life, and are not distressing. However, some questions do ask about this, and we understand that this may be difficult to think and talk about.

There will be warnings in the survey before these questions are asked. You can also opt to skip these questions at any time, or leave any question you do not want to answer blank. If you do experience any upsetting thoughts or feelings as a result of taking part, there are contact points provided below and in the survey for further support.

What are the benefits of taking part?

We hope that you will enjoy contributing to research aiming to understand and reduce suicide, and raising awareness of these difficulties in adults with and without ASC.

Who will have access to my data?

All information collected through the online survey is anonymous – this means we cannot identify you, as we do not ask for your name or your contact details. We will keep all research data safe by storing it in password-protected files which only the researchers can access. You have the option to provide a contact email address if you would like to take part in future similar studies. Providing your email address is completely voluntary and if you choose to do so, it will be separated from the responses you provide so that your questionnaire answers are not attributable to the email address, and your responses will remain anonymous.

As the study is anonymous we will not be able to identify those taking part. If you choose to contact the Coventry University researchers to discuss the research further we will keep your communication confidential. However, if you provide us with information during contact outside of the online survey which indicates that you or someone else is at risk of harm, or that a criminal offence may have or will be committed, we are required to inform the relevant authorities. **For access to free, confidential advice about suicide or self-harm, please see below.**

What will happen with the results of this study?

Results from the study will be presented at conferences, training events, and written up for publication in peer reviewed journals. Results will be analysed and presented in terms of groups of people, with no way of identifying the individuals involved.

Who has reviewed this study?

This study has been reviewed and approved by the Coventry University Ethics Panel.

Further support

1. Thoughts and feelings of ending your own life

If you are currently experiencing thoughts of ending your own life, please seek further help from your local GP, Mental Health Team, or qualified physician, and/or contact any of these support organisations:

- In the UK and Republic of Ireland you may contact **Samaritans** for free, confidential support to anyone in crisis (24 hour service) on 116 123 or jo@samaritans.org. www.samaritans.org.
- In Canada you may visit http://suicideprevention.ca/thinking-about-suicide/find-a-crisis-centre/ to find a local 24/7 crisis centre.
- In the USA you may also contact **National Suicide Prevention Lifeline** on 1-800-273-8255 or www.suicidepreventionlifeline.org
- In Australia you may contact **Lifeline** on 13 11 14 or www.lifeline.org.au
- If you are aged under 35, in the UK and having thoughts of suicide you may contact Papyrus (https://www.papyrus-uk.org/) a confidential support and advice service by telephone 0800 068 4141, by text 07786209697 or email: pat@papyrus-uk.org (please note this service is open 10am-10pm weekdays, 2pm-10pm weekends and 2pm-5pm on bank holidays)

2. For help and advice for individuals and their families effected by self-harm and suicide

- **Harmless** provide information and support to people who self-harm as well as those supporting them: http://www.harmless.org.uk/
- **Mind** provide information about self-harm and mental health and offer advice on accessing treatment: http://www.mind.org.uk/information-support/types-of-mental-health-problems/self-harm/#.V679bo-cGP8
- **Papyrus** provide confidential advice and support to young people and anyone worried about a young person: https://www.papyrus-uk.org/

3. For more general support, information and advice about ASC please contact:

- National Autistic Society www.autism.org.uk
- National Autism Association www.nationalautismassociation.org

APPENDIX 3: BACKGROUND QUESTIONNAIRE

	Question	Response (tick where required)						
1	How old are you?							
2	What is your biological birth sex?	Male				Female		
3	How do you define your relationship status?	Single		In a relationship (but not married or in a civil partnership)		Married or in a civil partnership		Other (please specify)
4	Have you been diagnosed with any mental health condition?	No	Yes - depression	Yes - Bulimia	Yes - Anxiety	Yes - Schizophrenia	Yes - Anorexia	Yes – Other (please specify)
5	Have you been diagnosed with any developmental condition?	No	Yes – Autism Spectrum Condition	Yes – Attention Deficit Hyperactivity Disorder (ADHD)	Yes – Learning Disability	Yes - Dyspraxia	Yes – Developmental Coordination Disorder	Yes – other (please specify)

APPENDIX 4:
HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS; Zigmond & Snaith, 1983)

Tick the box beside the reply that is closest to how you have been feeling in the past week. Don't take too long over you replies: your immediate is best

D	A		D	A	
		I feel tense or 'wound up':			**I feel as if I am slowed down:**
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			**I get a sort of frightened feeling like 'butterflies' in the stomach:**
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occaisionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very often
		I get a sort of frightened feeling as if something awful is about to happen:			**I have lost interest in my appearance:**
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			**I feel restless as I have to be on the move:**
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
		Worrying thoughts go through my mind:			**I look forward with enjoyment to things:**
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
		I feel cheerful:			**I get sudden feelings of panic:**
3		Not at all		3	Very often indeed
2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
		I can sit at ease and feel relaxed:			**I can enjoy a good book or radio or TV program:**
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not often	2		Not often
	3	Not at all	3		Very seldom

APPENDIX 5:
INTERPERSONAL NEEDS QUESTIONNAIRE (INQ-10; Van Orden, 2009)

Directions: Please tick the extent to which the following statements are a true description of your feelings

	Not at all true for me	Mostly not true for me	Slightly not true for me	Sometimes true for me	Slightly true for me	Mostly true for me	Very true for me
These days, the people in my life would be better off if I were gone	1	2	3	4	5	6	7
These days, the people in my life would be happier without me	1	2	3	4	5	6	7
These days, I think my death would be a relief to the people in my life	1	2	3	4	5	6	7
These days, I think the people in my life wish they could be rid of me	1	2	3	4	5	6	7
These days, I think I make things worse for the people in my life	1	2	3	4	5	6	7
These days, I feel like I belong	1	2	3	4	5	6	7
These days, I am fortunate to have many caring and supportive friends	1	2	3	4	5	6	7
These days, I feel disconnected from other people	1	2	3	4	5	6	7
These days, I often feel like an outsider in social gatherings	1	2	3	4	5	6	7
These days, I am close to other people	1	2	3	4	5	6	7

APPENDIX 6: ACQUIRED CAPABILITY FOR SUICIDE SCALE (ACSS; Van Orden et al., 2008)

Directions: *The next 20 questions ask you how you feel about death and dying in general as well as how you feel about things that some people may find frightening.*

SCALE	0 = Not at all like me	1 = A little like me	2 = Sometimes like me	3 = Mostly like me	4 = Very much like me

1.	The fact that I am going to die does not affect me	0	1	2	3	4
2.	The pain involved in dying frightens me	0	1	2	3	4
3.	I am very much afraid to die	0	1	2	3	4
4.	It does not make me nervous when people talk about death	0	1	2	3	4
5.	The prospect of my own death arouses anxiety in me	0	1	2	3	4
6.	I am not disturbed by death being the end of life as I know it	0	1	2	3	4
7.	I am not at all afraid to die	0	1	2	3	4
8.	I could kill myself if I wanted to (Even if you have never wanted to kill yourself, please answer)	0	1	2	3	4
9.	Things that scare most people do not scare me	0	1	2	3	4
10.	The sight of my own blood does not bother me	0	1	2	3	4
11.	I avoid certain situations (e.g. certain sports) because of the possibility of injury	0	1	2	3	4
12.	I can tolerate a lot more pain than most people	0	1	2	3	4
13.	People describe me as fearless	0	1	2	3	4
14.	The sight of blood bothers me a great deal	0	1	2	3	4
15.	Killing animals in a science course would not bother me	0	1	2	3	4
16.	The sight of a dead body is horrifying to me	0	1	2	3	4
17.	I like watching the aggressive contact in sports games	0	1	2	3	4
18.	The best parts of hockey games are the fights	0	1	2	3	4
19.	When I see a fight, I stop to watch	0	1	2	3	4
20.	I prefer to shut my eyes during the violent parts of movies	0	1	2	3	4

APPENDIX 7: SUICIDE BEHAVIORS QUESIONNAIRE-REVISED; Osman et al., (1999)

Instructions: *Please check the number beside the statement or phrase that best applies to you.*

1. **Have you ever thought about or attempted to kill yourself?**
    1. Never
    2. It was just a passing thought
    3. I have had a plan at least once to kill myself but did not try to do it
    4. I have had a plan at least once to kill myself and really wanted to die
    5. I have attempted to kill myself, but did not want to die
    6. I have attempted to kill myself, and really hoped to die

2. **How often have you thought about killing yourself in the past year?**
    1. Never
    2. Rarely (1 time)
    3. Sometimes (2 times)
    4. Often (3-4 times)
    5. Very Often (5 or more times)

3. **Have you ever told someone that you were going to commit suicide, or that you might do it?**
    1. No
    2. Yes, at one time, but did not really want to die
    3. Yes, at one time, and really wanted to die
    4. Yes, more than once, but did not want to do it
    5. Yes, more than once, and really wanted to do it

4. **How likely is it that you will attempt suicide someday?**
    0. Never
    1. No chance at all
    2. Rather unlikely
    3. Unlikely
    4. Likely
    5. Rather Likely
    6. Very Likely