Social Problem-Solving and Suicidality

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Abstract

Aims. This thesis aimed to investigate the relationships between social problem-solving, defeat, entrapment and other cognitive risk factors (rumination, goal adjustment) for suicidal ideation and behaviour. The investigation was carried out using the framework of the Integrated Motivational-Volitional Model of Suicidal Behaviour (IMV; O'Connor, 2011) and this thesis aimed to test aspects of this theoretical model. In addition, this thesis also aimed to critically evaluate the measures of social problem-solving employed in suicide research.

Method. Five empirical studies across five chapters were conducted. In order to achieve the study's aims, a systematic review was conducted first which informed the selection of the social problem-solving measures employed within the thesis (Chapter 3). The review also identified the need to update the original Means End Problem-Solving task (MEPS; Platt & Spivack, 1975). A series of focus groups were conducted to revise and update the measure (Chapter 6), two studies were then conducted to test the revised measure (MEPS-R; Chapter 7). A further two studies investigated the relationship between social problem-solving and suicidal ideation and behaviour. The first empirical study was prospective (Chapter 5) and the second was experimental in design (Chapter 8). All studies employed both student and general population samples.

Results. The Social Problem-Solving Inventory (SPSI-R; D'Zurilla, et al, 2002) and the MEPS were identified as the most common measures employed in suicide research (Chapter 3). The SPSI-R was employed in all studies and the original MEPS was revised and tested. The MEPS-R was found to be a reliable measure, both inter-rater and internal consistency were good although the MEPS-R scores did not correlate with established risk factors of psychological distress (Chapter 7). However, in the experimental study the MEPS-R was found to correlate with psychological distress (Chapter 8). Dysfunctional social problem-solving was found to be the most pernicious of the SPSI-R subscales and individuals who reported a history of self-harm were found to score higher in dysfunctional problem-solving than individuals who reported no history of self-harm (Chapter 5 & 8). Dysfunctional social problem-solving was found to mediated the defeat-entrapment relationship and rational problem-solving moderate this relationship. Defeat had no discernible impact on social problem-solving performance (Chapter 8).

Conclusion. This research makes a novel contribution to the understanding of the relationships between social problem-solving, defeat, entrapment, rumination, goal adjustment and suicidal ideation/behaviour. It also highlights the importance of the dysfunctional aspect of social problem-solving. The IMV model was a useful framework for understanding these relationships. In addition, the revised MEPS (MEPS-R) is a reliable measure of social problem-solving, which is more applicable for use in today's society but it requires further testing, especially in clinical populations.

Contents

Chapter 1: Introduction ………………………………………………………..1

Chapter 2: Theoretical Framework…………………………...…………14

Chapter 7. Testing the Means End Problem-Solving Task-Revised…………………………………………………….…...171

Chapter 8: Experimental study investigating the relationship between social problem-solving and defeat…………………....….. 199

LIST OF TABLES

LIST OF FIGURES

Appendices

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Finally, throughout this PhD I worked at a helpline for those who are struggling to cope with life. This was a humbling experience, and I am grateful to all the anonymous individuals I spoke to over the years who divulged and explored very personal issues. This role and responsibility helped to keep this thesis alive by the constant reminder that behind every suicide/self-harm statistic there is a real human person. These are the people to whom this thesis is dedicated.

Declaration

"I hereby declare that I am the sole author of this thesis, except where the assistance of others has been acknowledged.

It has not been submitted in any form for another degree or professional qualification."

Jaclyn Miller
September, 2014

Abbreviations

SPSI-R: Social Problem-Solving Inventory Revised

PPO: Positive Problem Orientation

NPO: Negative Problem Orientation

RPS: Rational Problem-Solving

ICS: Impulsive/Careless style

AS: Avoidance Style

MEPS: Means-End Problem-Solving Task

PSI: Problem Solving Inventory

IMV- Integrated Motivational Volitional Model of Suicidal Behaviour

Chapter One: Introduction

1.1 Abstract

Background

This chapter sets out the background for the thesis by providing an overview of how this research fits within the broader suicide research literature and outlining the complex interaction of risk (and protective) factors that increase suicide risk. This chapter introduces the topic of social problem-solving and suicidality to establish the aims of the thesis.

Method

A selective review of the relevant theoretical and empirical literature is conducted. Key terms in suicide research are defined followed by a brief overview of the extent of the problem of suicide and self-harm as well as the different disciplinary approaches employed to understand the suicidal mind. This is followed by an overview of a model of social problem-solving, followed by a brief critique of the research highlighting the relevance of social problem-solving, as a key construct, in suicide research.

Results

A model of social problem-solving (D'Zurilla & Goldfried, 1971) was identified as important to aid understanding of the social problem-solving process which is central to this thesis.

Conclusion

The overarching aims and the structure of the thesis were set out. The focus of the thesis is on measures of social problem-solving as key tools to further examine the relationship between social problem-solving, other key factors and suicidality.

"There is no one reason why people kill themselves. Suicide is the final common pathway for many human problems" Mark Williams (2014, p 123)

1.2 Overview

Suicide and self-harm are both recognised as national priorities (Knowles, Townsend & Anderson, 2011; O' Connor, Platt & Gordon, 2011), however, understanding why people engage in self-harm is complex. Self-harm, with and without suicidal intent, is one of the leading causes of admissions to accident and emergency departments with an estimated 220,000 presentations following self-harm each year in England (Hawton, Bergen, Casey, Simkin, Palmer, et al., 2007). Self-harm is not a new phenomenon, it has also been a major health concern in the UK for 50 years (Collinson, Owens, Blenkiron, Burton, Graham et al, 2014). In addition, evidence for those treatments that are effective for the short-term and longer-term management of self-harm is quite limited (NICE, 2011; NICE, 2004; Hawton,Townsend, Arensman, Gunnell, House & van Heeringen, 1999) – and requires urgent attention. However, on a more positive note, there is growing evidence for psychological interventions, which incorporate social problem-solving/cognitive behaviour therapeutic components (NICE, 2011; 2004). Such interventions often have educational components that support individuals in solving every day problems more effectively (Hatcher, Sharon, Parag & Colins, 2011; D'Zurilla & Nezu, 1999, 2001). Despite these welcome advances in the development of social problem-solving interventions, there are still many gaps in the knowledge about how social problem-solving fits within the suicidal process. It is important, therefore, to fill these gaps which should, in turn, provide a more solid evidence base on which to build psychological interventions. Consequently, the overarching objective of this thesis is to better understand how social problem-solving, as a key cognitive risk factor, is associated with suicide risk (including associated with suicidal ideation and self-harm) as well as other established cognitive risk factors.

This chapter defines the terms employed within this thesis and discusses the importance of research into suicide and self-harm. This chapter also provides the reader with an overview of the social problem-solving construct and the guiding model of social problem-solving that is employed throughout this thesis (D'Zurilla & Goldfried, 1971).

1.3 Suicide and Self-harm

1.3.1 Definitions

Suicide, suicide ideation and self-harm are manifestations of cognitive and behavioural phenomena, which are the consequences of psychological distress (Van Heeringen, 2001).

Suicide is the act of deliberately killing oneself and attempted suicide is the term used to describe behaviour or an act that is carried out in an attempt to end one's life and suicide ideation is a term that describes thoughts about ending one's life (Van Heeringen, 2001). The nomenclature describing suicidal thoughts and behaviour is complex and by no means standardised (Silverman, Berman, Sanddal, O'Carroll and Joiner, 2007). Throughout this thesis the terms deliberate self-harm, self-harm and suicidal behaviour are used interchangeably (as in much of the research literature) to describe any self-inflicted behaviour, which, without intervention could have led to death. However, this interchangeability masks an on going debate within the research literature (Kapur, Cooper, O'Connor & Hawton, 2013; Butler & Malone, 2013). To date, there is no consensus about which terms should be used to describe self-harming behaviours with different motivations. Indeed, one of the most hotly contested issues relates to the distinction made, commonly in the USA, between non-suicidal self-injury and attempted suicide. A brief overview of the debate is provided below.

The reasons for understanding the 'why' of self-harm are still quite limited (Townsend, 2014) and, over recent years, there have been many attempts to better describe these behaviours, using terms which more accurately reflect the complexity of the underlying motives (e.g., parasuicide and self-harm, suicide attempts, non-suicidal self-injury etc.). In addition, these different labels have been used to describe the many individuals for whom their intentions surrounding self-harm are unclear or ambiguous. Indeed, Kreitman (1977) first coined the term parasuicide to account for this ambiguity, as parasuicide did not refer to one's motivation, it simply described the act of self-harm. It is notoriously difficult to ascertain an individual's intent after they have engaged in self-harm. However, this term has now gone out of fashion and the most commonly used term today in the UK is self-harm. Self-harm is defined by the National Institute of Health and Care Excellence (NICE, 2011) as any act of self-poisoning or self-injury, irrespective of the apparent purpose of the act. Given that self-harm is the term most commonly used by researchers and clinicians in the UK, it is the dominant term employed throughout this thesis. We acknowledge, however, that the term non-suicidal self-injury (NSSI) is becoming increasingly popular especially in North America and that it has been included in DSM-5 (as a diagnosis requiring further study; Kapur, Cooper, O'Connor & Hawton, 2013). It is only employed during this thesis when discussing studies that have utilised the NSSI terminology.

In addition to being an index of distress itself, self-harm is one of the strongest risk predictors of suicide (Bergen, Hawton, Waters, Ness, Cooper, Steer and Kapur, 2012; Ferguson, Horwood, Ridder & Beautrais, 2005) with a quarter of all annual suicides in the UK each year being preceded by a visit to hospital due to non-fatal self-harm in the previous year (Owens & House, 1994).

Suicide ideation is referred to as thoughts about self-destructive behaviour, whether or not death is intended (van Heeringen, 2001). These thoughts can range from vague ideas about ending one's life or to very concrete plans. Suicidal behaviour can cover a wide range of self-inflicted behaviours, which have non-fatal or fatal outcomes. Suicidal behaviour is used to describe self-harm or attempted suicide.

The term suicidality, when used in this thesis, refers to any suicidal activity, including ideation and behaviour, based on the assumption that these are on a continuum where ideation leads to planning which then leads to suicide acts. Although some authors (e.g., Silverman, 2011) argue that this term should be avoided in research, for the ease of expression, it is employed within the thesis to describe both thoughts and behaviour, where appropriate.

1.3.2 Extent of the problem

The recent World Health Organisation World Suicide Report (WHO, 2014) highlighted that suicide is a major public health concern, and reported that more than 800,000 people die by suicide every year. This equates to 11.4 per 100,000 of the world's population. Importantly, suicide is among the top three leading causes of death among those aged 15 – 44 years and the second leading cause of death among those aged between 10 to 24 years. In addition one of the four objectives in the Comprehensive Mental Health Action Plan 2013 – 2020 (WHO, 2013) has called for a 10% reduction of suicide rates in countries by 2020. In Scotland alone, 746 people died by suicide in 2013 (Choose life, 2014). In other words, two people die by suicide every day in Scotland. Suicide deaths in Scotland, like most other Western countries, are accounted for, largely, by men. Specifically, men are three times more likely than women to die by suicide, and rates of suicide increase markedly as a function of increasing social deprivation (Platt, 2011).

Prevalence rates for self-harm are more difficult to record and collate due to the differences in terminology and recording/ascertainment practices; indeed self-harm is

frequently under-reported and there are very few studies of community rates of self-harm beyond adolescents (O'Connor, Rasmussen & Hawton, 2014). In Western countries, compared to men, women often have higher rates of reported non-fatal self-harm than suicide (Arensman, Fitzgerald, Bjerke, Cooper, Corcoran and DeLeo, 2008) and self-harm is more frequent in younger compared to older age groups (Schmidtke, Bille-Brahe, DeLeo et al., 1996). Although most of the self-harm research has focused on hospital treated self-harm, a recent anonymous survey conducted in Scotland with school pupils (mostly 15-16 year olds) found that 13.8% of respondents reported self-harm (at some stage in their lives) which was found to be similar to English rates. The number of hospital admissions for self-harm in England for the period 2009/2010 was 114, 242 (NICE, Self-harm: longer-term management, 2011). Given the scale of self-harm, self-harm has been identified as one of four key aims of the national programme for improving mental health and wellbeing in Scotland and is now a key mental health priority in England.

1.3.3 Why do people engage in suicidal behaviour?
Knowledge about the factors associated with suicide risk has increased substantially in the last two decades (Hawton & van Heeringen, 2009; Hawton, Saunders & O'Connor, 2012). Indeed, it is now generally accepted that suicidal behaviour is the outcome of a complex interplay of aetiological factors, which are psychological, biological and social in origin (Mann, 2003).

1.4 Risk factors
Suicide is the outcome of a complex process and the causes are not fully understood (O'Connor & Nock, 2014). It is not one single factor but rather numerous factors that contribute to an individual developing suicidal thoughts and engaging in suicidal behaviour. As noted above, these factors can be social, biological and psychological in nature. However, given that this thesis is concerned with psychological factors only a brief overview of social and biological determinants is outlined below.

1.4.1 Social Factors
It could be argued that Durkheim introduced the 'social' into the causes of suicide (Durkheim, 1952) and he was also strongly of the view that not all suicides were related to psychiatric illness. More recently, a review of psychological autopsy studies (Cavanagh, Carson, Sharpe & Lawrie, 2003; which provide more insights into the reason why people choose to end their life), it was clear that suicide does not occur within a social vacuum

and that social factors are key to understanding suicide risk. Indeed, epidemiological studies have also enhanced our understanding of suicide risk in this context by demonstrating that socio-economic inequality is risk factor for suicide (Platt, 2011).

By way of example, in one such landmark study, Platt, Boyle, Crombie, Feng and Exeter (2007) investigated the association between social class, socio-economic deprivation and suicide from 1989 to 2002 in Scotland and they found that suicide risk increases with area of deprivation and in addition they found that socio-economic status was an important risk factor for suicide. A study by Exeter and Boyle (2007) found that there was a significant geographical cluster of suicide among young adults in the east of Glasgow in three separate time periods. In addition, a systematic review of the labour market found that those who are unemployed are two to three times more likely to die prematurely by suicide that those who are in work (Platt & Hawton, 2000).

It is also clear that suicide rates are higher in rural areas compared to urban population areas (Stark, 2011), specifically within farming communities. Closer inspection of the reasons why risk is elevated suggests that the increased risk of suicide in these communities is related to increased isolation, adverse socio-economic conditions, higher rates of substance and alcohol misuse and greater access to more lethal means of suicide. Taken together, each of these studies highlights that social factors can also contribute to an increased risk of suicide in some individuals but not in others and that this risk can be, in part, social in origin.

1.4.2 Biological Factors

It is often cited that suicide is more common in the relatives of those who have completed suicide (Voracek & Loibl, 2007). From this, one could infer that there is a genetic risk to suicide and that suicide risk can be inherited. Indeed in a recent review paper, van Heeringen and Mann (2014) posit that 50% of the risk associated with the vulnerability (diathesis) to suicide is inherited. However, sophisticated twin studies (Voracek & Loibl, 2007; Brent &Mann, 2005 and Baldessarini & Hennen, 2004) have endeavoured to disentangle the genetic and environment influences and have argued that, to understand the relative influence, it may be more useful to consider genetic risk factors within the context of a diathesis-stress model.

The role of serotonin within the aetiology and course of suicide risk has also received considerable research attention in recent decades (Mann & Currier, 2011). There is now consistent evidence that alterations in the neurological systems are associated with suicidal behaviour, specifically alterations to the serotonergic and noradrenergic neurotransmitter system, and the hypothalmic-pituitary-adrenal axis (HPA). The serotonergic system has been found to have reduced serotonin input to the brain areas which are known to be involved in behaviour inhibition and/or decision making (Mann & Currier, 2011). Nevertheless, Mann & Currier (2011) fail to mention whether participants were taking antidepressants or whether this was taken into consideration as a potential confounding factor during the reported studies. Antidepressant medication, specifically serotonin re-uptake inhibitors (SSRIs) have caused concern in relation to an increased risk of suicidality in young people (Goldney, 2012). SSRIs function by increasing serotonin, to increase mood and therefore, lower suicide risk, however, it is unclear why this anti-depressant medication may result in an increased risk of suicide in young people under 18 years. Abnormalities in the noradrenergic system are also associated with deficits in the neurotransmitter norepinephrine which, in tandem with the HPA, are involved in the regulation of the stress response system. Finally, it may also be the failure of the HPA to supress cortisol secretion (i.e., high levels of cortisol) that is associated with suicidal behaviour. In addition, the HPA is interrelated with the serotonergic and noradrenergic systems (Mann & Currier, 2011).

1.4.3 Mental illness

Psychological autopsies studies report that over 90% of people who kill themselves are mentally ill (Kapur, 2009; Cavanagh et al. 2003). For example, Mann (2002) found that two thirds of the 90% of suicides who had a mental illness had a diagnosis of depression. Clearly, mental illness (especially mood disorder) is a major risk factor for suicide. However, the challenge is that the vast majority of people with mental illness do not kill themselves – and to date, we are very poor at identifying which individuals with depression are most at risk of killing themselves. Specifically, it has been estimated that less than 5% of people with depression take their own lives (O'Connor & Nock, 2014; Bostwick & Pankratz, 2000) – so this means that 95% do not kill themselves. This brings us to a key issue in suicide research and an underpinning rationale for this thesis. In brief, we need to get better at identifying the differences between individuals who go on try to kill themselves and those who do not, whilst having the same predisposing vulnerabilities

or risk factors (like mental illness). In other words, what factors differentiate the 5% of high risk individuals who kill themselves from the 95% who do not?

Given that an individual makes a choice to end his or her own life, we believe that psychological factors are central to distinguishing between those high risk individuals who do attempt suicide versus those who do not attempt suicide. As a result, in the next section key psychological factors, including social problem-solving are outlined.

1.4.4 Psychological Factors

As is evident in Table 1.1 (adapted from O'Connor & Nock, 2014), a whole plethora of psychological (personality and cognitive) risk factors have been identified as being markers of suicide risk. However, as this thesis is only concerned with five specific cognitive factors (namely, rumination, goal adjustment, defeat, entrapment as well as social problem-solving), discussion of the factors associated with personality and individual differences is beyond the scope of this chapter (see O'Connor & Nock, 2014 for a review of this literature). An overview of the five cognitive factors that are central to this thesis (rumination, goal adjustment, defeat, entrapment and social problem-solving) is provided in the proceeding sections.

Cognitive factors play a central role in an individual's decision to try to kill him or herself (Reinecke, 2006). '*They function at the choice point at which an individual reflects on his or her life and predicament*' (Reinecke, 2006, p. 238). Although there are many different cognitive factors implicated in psychopathology, rumination (Morrison & O'Connor, 2008), goal adjustment (O'Connor, O'Carroll, Ryan & Smith, 2012) and social problem-solving (Speckens & Hawton, 2005) are key cognitive processes which appear to be dysfunctional in suicidal individuals. Additionally, as defeat and entrapment are central to recent theoretical models of suicide risk (see Chapter 2) they are included in this thesis. The aforementioned cognitive factors are discussed in more depth in the following chapter (Chapter 2) and their proposed relationships with social problem-solving are also evaluated, whilst this Chapter will focus on social problem-solving

1.5 Social problem-solving

1.5.1 Background

D'Zurilla and Goldfried (1971) put the 'social' into problem-solving. Up until that point most research into problem-solving had focused on solving practical problems. Indeed in their seminal paper, D'Zurilla and Goldfried (1971) proposed a conceptual model of problem-solving training aimed at improving an individual's competency. By pulling together research from different fields they identified key competencies that would enable individuals to solve everyday problems to maximise their success.

According to D'Zurilla and Goldfried, having adaptive social problem-solving skills is vital to prosper in society as *"(m)odern man finds himself confronted continuously with situational problems with which he must cope"* (D'Zurilla and Goldfried, p107, 1971). Indeed social problem-solving has been found to be an important factor for behavioural adjustment more generally (D'Zurilla & Maydeu-Olivares, 1995).

Around the same time as the conceptual work on social problem-solving was growing, problem-solving therapies were being introduced (in the late 1970's) to improve psychological wellbeing including suicide risk (Nezu, Nezu & Perri, 1989). Indeed in a meta-analysis of randomised control trials of problem-solving interventions with individuals who reported self-harm (Collinson et al., 2014), patients who were offered problem-solving therapy significantly improved with regard to depression and hopelessness compared to those who received the control intervention. It is this success in social problem-solving interventions that has ignited, in part, the basic science research into dysfunctional problem-solving and suicidal behaviour.

Other evidence also suggests that a therapeutic intervention based on the D'Zurilla and Goldfried (1971) model of social problem-solving (which is described below) is effective in improving problem-solving abilities in individuals who are suicidal or who report self-harm (Lerner & Clum, 1990; McLeavey, Daly, Ludgate & Murray, 1994 and van der Sande, Rooijen, Buskens, Allart et al., 1997). Problem-solving therapy is thought to be effective by increasing the likelihood that an individual begins to develop a more positive problem-orientation which, in turn, decreases the frequency with which s/he avoids responding to problems and/or responds less impulsively to problems.

Table 1.1: Key psychological risk and protective factors for suicidal ideation and suicidal behaviour (adapted from O'Connor and Nock, 2014)

Personality and Individual differences	Cognitive Factors
Hopelessness	Cognitive rigidity
Impulsivity	Rumination
Perfectionism	Thought suppression
Neuroticism and extroversion	Autobiographical memory biases
Optimism (P)	Belongingness and burdensomeness
Resilience (P)	Fearlessness and injury and death
	Pain insensitivity
	Problem-solving and coping (P)
	Agitation
	Implicit associations
	Attentional biases
	Future thinking
	Goal adjustment (P)
	Reasons for living (P)
	Defeat and entrapment

P = Protective Factor

1.5.2 Definitions

Social problem-solving is about dealing with everyday problems in the real world and can be defined as a 'self-directed cognitive behavioural process by which a person attempts to identify or discover effective or adaptive solutions for specific problems encountered in everyday living' (D'Zurilla& Nezu, 2007). In other words, social problem-solving allows individuals to generate a variety of solutions to problems encountered in everyday living. It is a conscious rational, effortful, purposeful activity with the aim of reducing emotional distress or to change something for the better.

As noted above, the model of social problem-solving that is at the core of this thesis' conceptualisation of social problem-solving is D'Zurilla and Goldfried's (1971) model. This model has three self-explanatory major concepts: (1) problem-solving, (2) problem and (3) solution. Problem-solving is the process of finding solutions to specific problems, and a problem is defined as a situation where there is no effective coping response immediately available which leads to the requirement of problem-solving behaviour. The solution is the product or outcome of the problem-solving process when it is applied to a specific problematic situation. Importantly, within the model there is a distinction between problem-solving (as defined above) and solution implementation; solution implementation refers to the process of carrying out solutions in actual problem situations. Solution implementation crosses over into the realms of coping. According to D'Zurilla and Chang (1995), problem-solving is a form of coping but not all coping can be conceptualised as problem-solving (D'Zurilla & Chang, 1995).

1.5.3 Dimensions of social problem-solving ability

Nezu (2004) argues that the outcomes of problem-solving are determined by two separate dimensions: (i) problem orientation (defined as a problem-solving cognitive set that involves two general dispositions) and (ii) problem-solving style.

Problem orientation is viewed as either negative or positive and this is the motivational part of problem-solving. Negative problem orientation (NPO), for example can cause negative affect and avoidance motivation, which in turn can impact on later problem-solving attempts (D'Zurilla & Nezu, 2001). Those high on negative orientation typically feel that their problems are unsolvable, they doubt their own ability to solve them and they see problems as threats rather than opportunities. In contrast to this, those high on positive orientation (PPO) believe that their problems can be solved, they view them as a challenge, they believe that they have the ability to solve the problem and they recognise that problems will take time and effort to solve (D'Zurilla et al, 2002).

Problem-solving style comprises a functional dimension (rational problem-solving; RPS) and two dysfunctional dimensions (avoidance; (AS) and impulsive/careless style (ICS)). Rational problem solving involves systematically planning how to deal with a problem and harnessing skills that contribute to solving the problem. Impulsive-carelessness style, on the other hand, is characterised by attempts to solve problems, which are impulsive, careless, hurried and incomplete (Chang, D'Zurilla & Sanna, 2004). Avoidant style is different still, it is characterised by procrastination, passivity or inaction and dependency (Chang et al., 2004).

1.5.4 The social problem-solving process

As highlighted in the previous section, based on D'Zurilla & Goldfried (1971)'s model problem-solving in the real world is based on the outcome of two partially independent processes (Chang et al., 2004). These processes are two problem orientations (PPO and NPO) and three problem-solving styles (RPS, ICS and AS). The constructive orientation (PPO) and style (RPS) are expected to correlate as are the dysfunctional orientation (NPO) and styles (ICS and AS). Constructive or effective problem-solving is a process by which positive problem orientation facilitates rational problem-solving which, in turn, is likely to produce positive outcomes. On the other hand, dysfunctional problem-solving is viewed as a process by which a negative problem orientation contributes to an impulsive/careless or avoidant style (Chang et al., 2004). Therefore, the model posits that individuals who score highly on positive problem-orientation and rational problem-solving, when they

encounter challenges or problems to solve, are more likely to persist until they reach the desired outcome than those who endorse a negative problem-orientation.

1.5.5 Measures of social problem-solving

Numerous measures of social problem-solving have been developed in recent decades, however the most common are the Means End Problem-Solving task (MEPS; Platt & Spivack, 1975), the Problem Solving Inventory (PSI; Heppner, 1986) and the Social Problem-Solving Inventory (SPSI-R; D'Zurilla, Nezu & Maydeu-Olivares, 2002). Although studies that have employed these (and other) different measures have demonstrated, to different degrees, that social problem-solving has a role to play within the suicidal process, one of the difficulties with comparing results across studies is the diversity in the problem-solving measures which have been employed. The strength and weaknesses of these measures are reviewed in detail in the systematic review (Chapter 3) and therefore are not discussed further here.

1.5.6 Social problem-solving and suicidality

There is an extensive body of research that indicates that suicidal individuals exhibit deficits in social problem-solving (Pollock & Williams, 1998; Speckens & Hawton, 2005). Indeed the potential role of social problem-solving in the aetiology and course of psychological distress has been investigated since the 1960s, starting with the pioneering work of Neuringer (1961) who studied dichotomous thinking (defined as a cognitive style which is characterised by the tendency towards all-or-nothing thinking – tunnel thinking), and found that suicide attempters were more dichotomous in their thinking than psychosomatic patients and 'normal' patients.

Since then a number of cognitive factors have been identified as risk factors for suicide (see section 1.4.4). In particular social problem-solving deficits have been identified as being associated with both suicide ideation and behaviour (Schotte & Clum, 1982, 1987; Clum & Febbraro, 2004; D'Zurilla, Chang, Nottingham & Faccini, 1998, Pollock & Williams, 2004 and Speckens & Hawton, 2005). Social problem-solving has also specifically been associated with hopelessness (Bonner & Rich, 1988 and Chang, 1998), depression (Nezu, 1998) and rumination (Lyubomisrsky & Nolen-Hoeksema, 1995). Recent research into social problem-solving has examined social problem-solving as a state vulnerability factor (Williams, Barnhofer, Crane & Beck, 2005). This is crucial to advancing knowledge of the relationship between social problem-solving and mood. The

specific details of what is known about the nature of the relationship between social problem-solving and suicide risk are provided in Chapter 3.

1.6 Aims of this thesis

Although there have been many advances in our understanding of the role of social problem-solving within the suicidal process, the exact nature of the relationship between social problem solving and suicidality remains complex and not fully understood. Like many other psychological risk factors, it is not clear how social problem-solving relates to other established risk factors within suicide research. As noted earlier, a better understanding of social problem-solving is also important so as to inform the development of interventions to reduce risk of suicidal behaviour. The primary aim of this thesis, therefore, is to extend scientific knowledge in the area of social problem-solving by firstly, systematically examining how social problem-solving tends to be measured/assessed within suicide research. Second, it aims to examine the relationship between social problem-solving and suicidality as well as between other psychological factors within the context of a theoretical model. Selecting a suitable theoretical model is very important as it acts as a guide for the generation of hypotheses and the subsequent interpretation of findings.

1.7 Thesis structure

In Chapter 2 the key relevant theories of suicidal behaviour together with associated empirical evidence are outlined. The key research questions for the thesis are also set out at the end of Chapter 2. The literature on social problem-solving and suicidality is systematically reviewed in Chapter 3. Chapter 4 details the methods employed throughout this thesis. Chapter 5 is a prospective study of healthy adults that examines the inter-relationship between the different social problem-solving subscales (D'Zurilla, et al., 2002) and their relationship with rumination, goal adjustment, defeat and entrapment. Building on the recommendations of the systematic review reported in Chapter 3, the original Means End Problem-Solving task (MEPS; Platt & Spivack, 1975) is revised and updated to yield the MEPS-R in Chapter 6. The new MEPS-R is then tested in two separate studies in Chapter 7. In the final empirical study (Chapter 8), an experimental study in which the effects of defeat on social problem-solving are explored as well the relationship between different measures of social problem-solving. This thesis ends with a final discussion (Chapter 9) that integrates the findings across the empirical studies and summarises the contribution of research to advancing understanding of social problem-solving and suicide risk.

Chapter Two: Theoretical framework

2.1 Abstract

Background

The current chapter introduces the key psychological models which inform the theoretical framework for this thesis.

Method

Key theories are reviewed together with the presentation of selected empirical evidence in support of the theories.

Results

As social problem-solving is an explicit component of the Integrated Motivational Volitional Model (IMV; O'Connor, 2011) of suicidal behaviour, the IMV model was selected as the most appropriate theory to guide the studies contained within this thesis. Social problem-solving was then examined within the context of the IMV model.

Conclusion

The Social Problem-Solving Inventory-Revised (SPSI-R; D'Zurilla, et al., 2002) and the Means End Problem-Solving task (MEPS; Platt & Spivack, 1975) were selected to investigate the relationship between social problem-solving and suicidality.

2.2 Introduction and Overview

In the previous chapter, the rationale for focusing on social problem-solving as a risk factor for suicidal behaviour was identified as an important area that requires further investigation. This present chapter extends Chapter 1 by exploring some of the key theories and models that have established utility in suicide research and that are relevant to this thesis. The theories/models are described, including a critical examination of the extant empirical research in relation to each model. The chapter also summarises the evidence for key suicide risk variables and how it relates to social problem-solving and the overarching theoretical framework, the Integrated Motivational-Volitional model of suicidal behaviour (O'Connor, 2011).

The aim of this chapter is to set the scene for the research studies that follow, therefore the examination of the theories/models presented herein is not an exhaustive review of the literature; rather it is specific to this thesis (for a more comprehensive review see O'Connor, 2011 and O'Connor & Nock, 2014).

2.3 Diathesis-stress hypothesis

In essence the diathesis-stress hypothesis (Schotte & Clum, 1982; 1987) highlights a key role for pre-existing cognitive and biological vulnerability factors which become particularly pernicious when activated by stress. In an important study, Schotte and Clum (1982) examined the relationship between problem-solving skills, stress, hopelessness and suicide ideation in a college population. They found that those who reported poorer social problem-solving and higher levels of stress were more likely to experience higher levels of suicide ideation than those low on these dimensions. Following on from this, Schotte and Clum (1987) then compared the social problem-solving skills of a group of suicide attempters and a hospitalised but non-suicidal control group. They found that the suicidal group was less able to generate alternative solutions to social problems (using the Means End Problem-Solving task) compared to the control group. Taken together these studies provide evidence for poor social problem-solving as a cognitive vulnerability factor within the diathesis-stress model of suicidal behaviour.

Many studies since have yielded further support for the diathesis-stress model (Dixon, Heppner & Anderson, 1991; Dixon, Heppner & Rudd, 1994 and Rudd, Joiner & Rajab, 1996), identifying a range of vulnerabilities that interact with stress to predict suicide risk.

For example, impaired positive future thinking (O'Connor et al., 2004) has also been identified as one such cognitive vulnerability within the model.

2.4 Cry of Pain hypothesis

Before Williams' (2001, 2014) Cry of Pain hypothesis is described, the theories influential to its development are outlined. Williams' model builds on the diathesis-stress hypothesis (see O'Connor & Sheehy, 2001), Baumeister's Escape theory (1990) and Gilbert's phenomenon of Arrested Flight (Gilbert & Allan, 1998; O'Connor, 2011).

The concept of escape has long been identified as a feature of suicide. Indeed, Baechler (1979) was one of the first to describe suicide as a 'flight to escape'. Furthermore, Shneidman (1996) has described suicide in terms of psychological pain that 'the individual wishes to escape…escape from pain is relief'. Yet it was Baumeister's escape theory (1990) that really began to bring 'escape' to the fore in advancing our understanding of individuals who feel suicidal. Baumeister (1990) posited that suicide is driven by the desire to escape from oneself; he also argues that self-harm also allows escape from painful self-awareness, albeit a more temporary escape than suicide. Within this perspective suicide is viewed as a consequence of progression through six stages in which the individual escapes from unbearable pain both cognitively and physically. Stage 1 is about falling short of one's own expectations and standards; stage 2 is concerned with blaming oneself for these failings, which then leads to stage 3 and 4 where negative self-awareness generates negative affect. Stage 5 is characterised by cognitive deconstruction (rejecting and avoiding meaningful thought and escaping into a disinhibited and irrational state of mind), which precedes stage 6, which is described as reduced behavioural inhibition where the intrinsic fear of causing pain through death by suicide is regarded as more acceptable.

Gilbert and Allan's (1998) social rank theory is derived from the animal literature and brings two concepts, defeat and entrapment, together to form the basis of an evolutionary approach to depression. Defeat is defined as a sense of failed social struggle; loss and reduced social rank (Gilbert & Allan, 1998), whilst entrapment is concerned with a desire to escape from a defeating situation coupled with the perception that all escape routes are blocked. Entrapment is conceptualised in terms of being external (which relates to perceptions of things in the outside world that induce escape motivation) and internal (i.e., the escape motivation is triggered by internal feelings and thoughts; (Gilbert & Allan, 1998). The concept 'arrested flight' is the sociobiological term used to describe when an

animal is defeated but cannot escape; it is the state of entrapment where the motivation to take flight is blocked, not the defeat itself that is particularly dangerous. It is this state that Gilbert and Allan posited to be associated with depressed mood.

Building on Gilbert and Allan's (1998) work, Williams (1997) then cautiously extended the focus of the arrested flight model to suicidal behaviour and proposed that suicidal behaviour may be usefully conceptualised as a 'cry of pain'. His model (i.e., the cry of pain) was the first account to incorporate the concepts of defeat and entrapment into the model of suicidality. According to Williams (2011), suicidal behaviour is a reactive response ('the cry') to a situation that has three components: defeat, no escape and no rescue (the belief that there is no help available). These three components act together to increase suicide risk (see Figure 2.1 below). As is evident in Figure 2.1 below, perceptions of defeat, entrapment and rescue are determined by other psychological variables. For example, in relation to social problem-solving (Pollock & Williams, 1998), when an attempt to solve an interpersonal problem is perceived to be unsuccessful the individual may feel powerless to escape from the defeating situation with no opportunity for rescue. Williams' work is also noteworthy because he characterised suicidal behaviour as a 'cry of pain' rather than the traditional 'cry for help' (Williams & Pollock, 2000).

2.4.1 Empirical support for the model

In a case-control study O'Connor (2003) found evidence in support of the Cry of Pain (CoP) hypothesis. He found that suicidal patients reported higher levels of defeat and entrapment and lower levels of social support than hospital controls whilst controlling for hopelessness and depression. A few years later, Rasmussen and colleagues (2010) extended the latter research by investigating the difference between first-time and repeat episodes of self-harm in a case-comparison study. Consistent with the CoP model these authors found that total entrapment and internal entrapment mediated the defeat-suicide ideation relationship. In addition those in the repeat self-harm group exhibited higher levels of defeat than first-time self-harmers. A more recent study still (Slade, Edelmann, Worrall and Bray, 2012) tested the components of the CoP model as predictors of self-harm with adult prisoners. These authors also found evidence in support of the model as applied to self-harm.

These aforementioned studies show the development of a growing empirical base in support of the core components of the model. Although there have been welcome advances

in recent years highlighting the utility of conceptualising defeat and entrapment as distinct constructs, other theorists (Goodall, 2008; Taylor, Wood, Gooding, Johnson and Tarrier, 2008) have argued that defeat and entrapment should be viewed as one single construct. Consequently, how the constructs of defeat and entrapment are operationalized and defined has received welcome attention. For example, Johnson and colleagues (Johnson et al., 2008; Taylor et al., 2008) argued that the initial research on the CoP had not fully defined defeat nor made it clear which situations would lead to defeat (Johnson, Gooding and Tarrier, 2008). Despite these concerns, however, this latter research group still recognises that defeat and entrapment are key predictors of suicidality (Taylor, Gooding, Wood, Johnson and Tarrier (2011) but as noted above, they advocate that these two factors are best defined as a single construct. Aside from Taylor and colleagues' study, it is important to note that the overwhelming majority of research evidence supports treating defeat and entrapment as distinct constructs. Consequently, they are operationalized separately within this thesis.
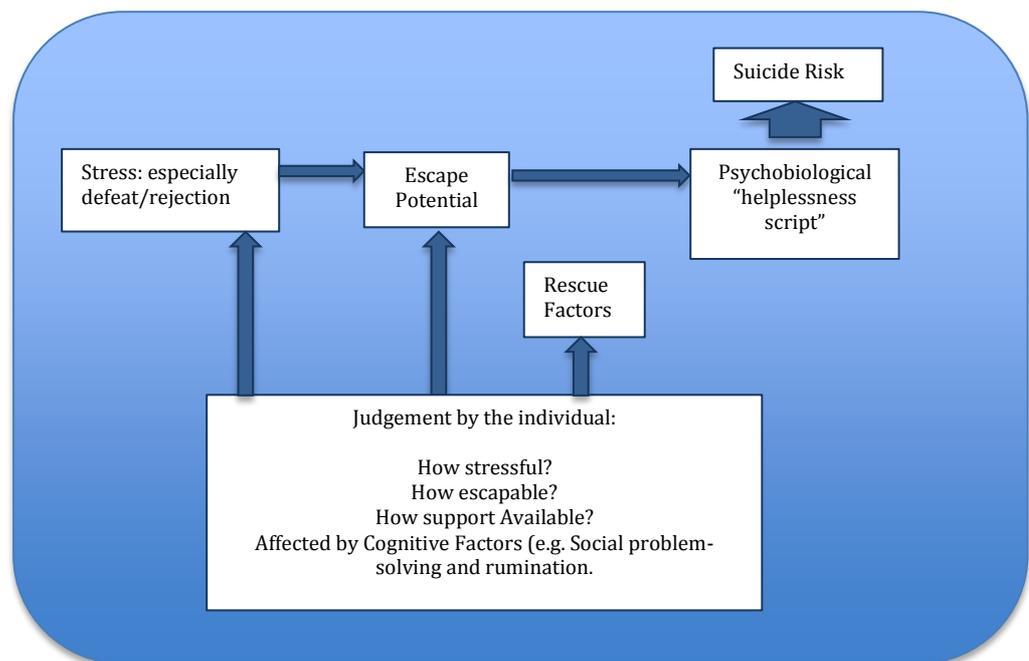
Figure 2.1 Cry of Pain Model (Adapted from Williams, 2001)

2.5 Differential Activation hypothesis

The differential activation hypothesis (Teasdale, 1988) proposes that if, during a depressive episode, an association between depressed mood and negative thinking (including suicidal thoughts) is formed such negative thinking patterns will be reactivated when low mood is experienced again in the future. The reactivation of such dormant cognitive styles poses a risk to the individual for falling into a full episode of depression

again. The ease with which such maladaptive cognitions are triggered by low mood is referred to as cognitive reactivity (Lau, Segal and Williams, 2004) – and the concern in the context of suicidal risk is that when suicidal thinking patterns become established, the risk of them re-emerging following even minor fluctuations in mood, is elevated. Specifically, in a study by Lau et al. (2004) the authors extended the differential activation hypothesis to suicide. Lau et al. (2004) investigated why some individuals remain vulnerable to suicidal reoccurrence whereas others do not. They posited that cognitive reactivity may be a key factor to explain why this reoccurrence happens rendering some individuals to remain vulnerable to suicide.

Cognitive reactivity has been defined as a particular pattern of thinking that can be triggered by small changes in mood (Teasdale, 1988). In the present context, it is the extent to which cognitions react to changes in mood. For example, a small setback or disappointment can lead to a mild fluctuation in mood which can trigger the chain of negative cognitions that have come to be associated with depression. The corollary is that it is not the resting levels of negative cognitive processes that determine vulnerability but rather how easily these cognitions are reactivated by even minor fluctuations in mood (Williams, Barnhofer & Crane, 2005). In short, this means that maladaptive cognitions or cognitive styles can be triggered by even mild mood fluctuations. It is this reactivity that is assumed to be the observable result of an underlying association of depressed mood and negative dysfunctional beliefs and cognitive biases that have occurred over the learning history of the individual (Kerhof & van Spijker, 2011).

The concept of differential activation is important as it explains how changes in mood can impact upon a range of established psychological risk factors including: autobiographical memory (Johnston et al 2008), hopelessness (Williams et al 2008), perceptions of defeat and entrapment (Goldstein & Wilner, 2002) positive future thinking (O'Connor & Williams, 2014) and social problem-solving (Williams et al., 2005).

2.5.1 Empirical support for the differential activation hypothesis / cognitive reactivity
In 2002, Goldstein and Willner employed a negative mood induction to examine the effects of negative mood on perceptions of defeat and entrapment. They found that the negative mood induction caused a worsening of mood and significantly increased perceptions of defeat and entrapment. In contrast the positive musical mood induction yielded an improvement in mood and significantly decreased defeat and entrapment

perceptions. It is noteworthy that the negative mood induction had a more marked effect on internal entrapment than it did on perceptions of external entrapment.

Almost ten years ago, Williams and colleagues (Williams et al., 2005) also induced a negative mood in (i) individuals who had a history of depression as well as among (ii) those with no history of depression. In this study they examined changes in social problem-solving (by employing the Means End Problem-Solving task) before and after the negative mood induction. They found that formerly depressed individuals with a history of suicide ideation produced significantly less effective problem-solving solutions than the depressed group with no suicidal thoughts post-induction.

More recently, Johnson, Tarrier and Gooding (2008) employed a defeat-inducing task, where they aimed to establish the role of defeat in impairing memory problems. These authors compared two groups, one in which participants received a defeat-inducing task (the task was impossible), and a control group in which participants did not experience a defeat task (they received the same task as in the defeat group, but on this occasion the task was achievable). Those in the defeat group were found to have higher levels of defeat and poorer memory retrieval than those in the control group after the defeat induction.

Finally, Williams, Van der Does, Barnhofer, Crane and Segal (2008) investigated the reactivity of hopelessness and suicidal ideation in a mood challenge study. This latter study found that individuals with a history of suicide ideation had higher scores on a subscale of hopelessness/suicidality after a mood induction than individuals without a history of suicide ideation. Consistent with the cognitive reactivity literature, Williams et al, posited that during an episode of depression an association is formed between depressed mood, hopelessness and suicidal cognitions, this then establishes a response pattern that may be easily reinstated when mood deteriorates at a later date. This, therefore, increases the risk of further suicidal crisis developing.

Taking such studies together, they consistently show that by either inducing low mood or defeat there appears to be a process of cognitive reactivity whereby previous associations that have been formed are reactivated. It is, therefore, not the resting levels of vulnerabilities that are crucial but how easily negative cognitions are reactivated by small changes in mood that are of more importance.

Williams describes the differential activation theory of cognitive reactivity as follows: "*It is not the resting levels of social problem-solving that are important in rendering someone*

vulnerable to future suicide crisis. Rather it is the ease with which these patterns of thinking can be activated." (Williams et al. 2005). Therefore it appears that the simple diathesis-stress model is inadequate to explain the relationship between social problem-solving and suicide (Biggam & Power, 1999).

2.6 Integrated Motivational Volitional Model of suicidal Behaviour

The Integrated Motivational-Volitional Model (IMV) of suicidal behaviour is a recently proposed model of suicidal behaviour, which extends both the diathesis-stress hypothesis and Williams' Cry of Pain hypothesis (2001). Additionally, O'Connor's model is also influenced by the Theory of Planned Behaviour (Ajzen, 1991).

An overarching aim of the IMV model is to differentiate between individuals who think about self-harm or suicide (ideators) and those who go on to attempt suicide or engage in self-harm (enactors) (O'Connor, 2011). As previously stated, the main drivers for the model are the Theory of Planned Behaviour (Ajzen, 1991), the Diathesis-stress hypothesis (Schotte & Clum, 1982; 1987) and the Cry of Pain model (Williams and Pollock, 2001). The IMV model has three phases; the first being the pre-motivational phase, which incorporates background factors and triggering events. The second phase is the motivational phase, which aids understanding regarding factors surrounding the development of an individual's intention to engage in suicidal behaviour. Williams' arrested flight model is key to this phase but it has been extended in the IMV model by specifying a range of cognitive and personality factors which facilitate movement from feeling defeated to feeling trapped and the emergence of suicidal ideation. The final phase, the volitional phase, describes the transition from suicidal ideation to suicidal behaviour (i.e., behavioural enactment). In short, the model maps the relationship between background factors, cognitive and personality factors, triggering events and suicidal ideation and behaviour. Mapping the transition from defeat to the emergence of suicidal behaviour (across the three phases) is characterised by three types of moderators. These are threat to self moderators (TSM), which include social problem-solving, memory biases and rumination processes and are defined as variables which increase the likelihood that defeat will lead to perceptions of entrapment. Motivational moderators (MM) are defined as any factors that change the likelihood that entrapment will lead to suicidal ideation and intent. Future thinking and goal regulation are motivational moderators. Finally, volitional

moderators (VM) are factors that bridge the suicidal ideation/intention-behaviour gap. These VMs could include impulsivity, access to means and implementation intentions (O'Connor, 2011).
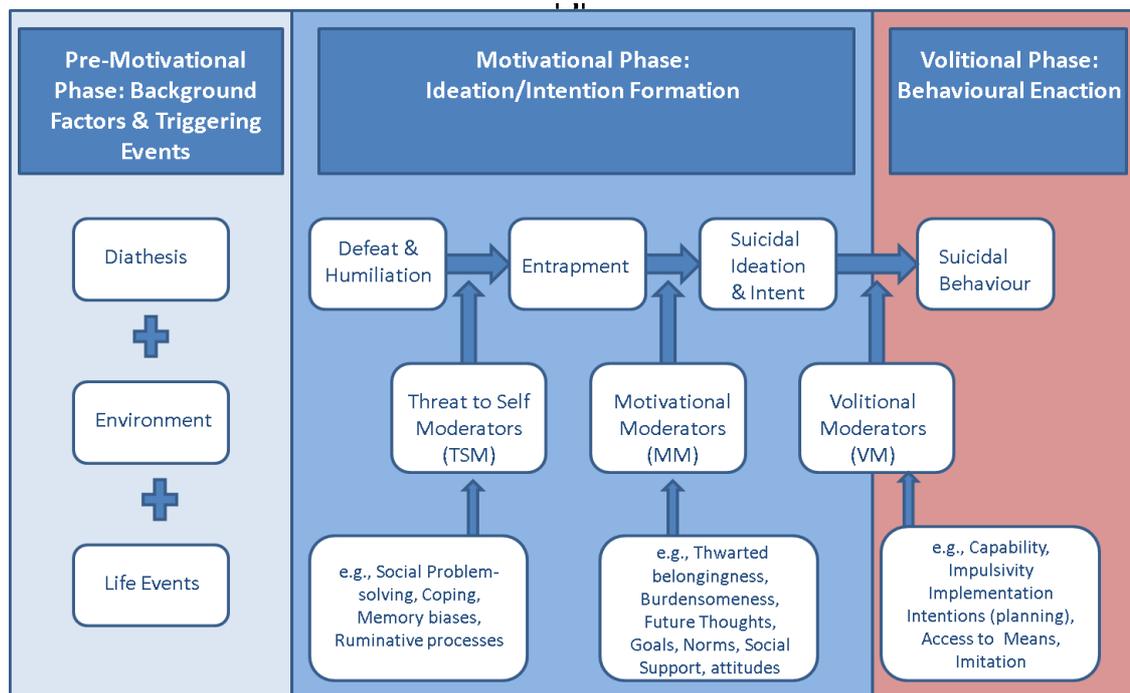
Figure 2.2 Integrated Motivational-Volitional Model (IMV; O'Connor, 2011)

2.6.1 Empirical support for the model

Evidence is beginning to accumulate in support of the different components of the IMV. For example, O'Connor, O'Carroll, Ryan and Smyth (2012) followed up patients admitted after an episode of self-harm two years later and investigated the role of goal regulation within the suicidal process. They found that younger people who have difficulties in engaging in new goals when faced with unachievable goals (motivational moderator) were more likely to be hospitalised with self-harm in the subsequent two years (beyond traditional clinical risk factors) compared to those who could re-engage in new goals with ease. Therefore, this study supports the IMV model as goal regulation (a motivational moderator) is acting as a proximal risk factor for suicidal behaviour. In a further study involving school pupils, O'Connor, Rasmussen and Hawton (2012) asked the young people to complete a series of self-report questionnaires. The study aimed to compare individuals who reported engaging in self-harm with those who reported thinking about self-harm only (but not engaging in self-harm) and a comparison group who did not report either. This study found that it was possible to distinguish adolescents who thought about self-harm from those that acted on their thoughts, i.e., had engaged in self-harm. Importantly, the two groups differed on levels of impulsivity, exposure to self-harm (i.e.,

exposure to self-harm by friends/family) and experience of negative life stress, in the predicted directions. According to the IMV model, these factors are posited to be volitional moderators which are those factors that bridge the intention-behaviour gap (Gollwitzer, 1999).

In another recent study, O'Connor, Smyth, Ferguson, Ryan and Williams (2013) investigated the predictive utility of defeat and entrapment in a sample of patients who had been admitted to hospital following a suicide attempt. This study followed up the participants four years after an index suicide attempt and in the univariate logistic regression analyses they found that defeat and entrapment were both significant predictors of suicidal behaviour. Of particular importance, though, in the multivariate analysis, only entrapment and past suicidal behaviour emerged as significant predictors of suicidal behaviour four years later. Therefore, this study reinforces the importance of defeat and entrapment being utilised as two distinct constructs and supports the IMV model.
A final study by O'Connor and Williams (2014) investigated cognitive reactivity by inducing defeat and negative mood in an experimental study of university students to investigate the impact of minor fluctuations in mood/defeat on positive future thinking. They found that positive future thinking is affected by mood and defeat inductions and that brooding and entrapment moderate the effects. In addition, they found that the effect of the defeat manipulation was not universal, as it did not impact upon individuals reporting low levels of entrapment. Once again, therefore, this study also highlights the utility of operationalising defeat and entrapment as two distinct constructs rather than as a single construct (Taylor et al., 2009).

Regardless of conceptual disagreements concerning defeat and entrapment, theoretical models are central to not only identifying key cognitive and personality variables that may increase the risk of suicide but they also act as hypothesis-generating frameworks, as they usually specify potential moderating and mediating pathways. So, given that the IMV model provides the most detailed map of the suicidal process, in the present thesis, it was employed to guide this thesis.

2.7 Key Factors (Mediators and Moderators) within the IMV model
As illustrated above (Figure 2.2), above the IMV model has numerous potential mediating and moderating pathways. However, within the constraints of a PhD, it is not possible to test all of these pathways, therefore, in the next section three cognitive and personality

factors that are posited (within the IMV model) to be important mediators and moderators within the suicidal process are described and are investigated within this thesis; these are, social problem-solving, rumination and goal adjustment.

2.7.1 Social problem-solving

As is evident in Figure 2.2, social problem-solving is a threat-to-self moderator within the IMV model.

2.7.1.1 Definition

As previously stated in Chapter 1, social problem-solving can be defined as the 'self-directed cognitive-behavioural process by which a person attempts to identify or discover effective or adaptive solutions for specific problems encountered in everyday living' (D'Zurilla & Nezu, 2007). In other words, social problem solving allows individuals to generate a variety of solutions to problems encountered in everyday life. It is a conscious rational, effortful and purposeful activity with the aim of reducing emotional distress or change something for the better. Therefore, effective problem solving is seen as an effective coping strategy that can reduce psychological distress.

2.7.1.2 Relationship between social problem-solving and suicidality

Chapter 1 highlights the key evidence investigating social problem-solving as a risk factor for suicidal behaviour. In this section, to set the scene for the thesis, the focus is limited primarily to two reviews of the literature that are frequently cited as key papers in this research area and a number of recent studies which are relevant to the present studies. As also noted in Chapter 1, the relationship between social problem-solving and suicidality is explored systematically and in detail in Chapter 3.

First, Pollock and Williams (1998) reviewed the research literature on the extent to which social problem-solving is a key psychological risk factor for suicidal behaviour. They identified key studies which showed that suicide attempters exhibit greater cognitive rigidity (Neuringer, 1967) than individuals who do not have a history of suicidality, and it is this rigidity that adversely affects their ability to solve social problems less effectively (Levenson & Neuringer, 1971). It seems that individuals who are faced with external stressors and have poor problem-solving skills are less able to generate solutions to challenging situations; as a consequence they become more overwhelmed, hopeless and therefore, more at risk of depression and suicidality (Pollock & Williams, 1998).

Second, Speckens and Hawton (2005) reviewed 23 papers that examined the nature of the relationship between social problem-solving and suicidal behaviour in adolescents. They found evidence for an association between suicidal behaviour and impaired social problem-solving. Although there was clear evidence for an association, they urged caution, as there was considerable difficulty in comparing studies due to the inconsistencies in defining terms, differences in measures of social problem-solving/suicidality, low numbers and many of the studies were cross-sectional in design. In short, there is evidence that social problem-solving is an important factor within the suicidal process. In Chapter 3 (and in the empirical chapters that follow), however, we explore whether specific components of social problem-solving may be differentially important as correlates of suicidality and we investigate the extent to which different measures of social problem-solving may be inter-related.

2.7.1.3 Social problem-solving and the IMV model

Within the IMV model, social problem-solving is a threat to self moderator (TSM; O'Connor, 2011), therefore when an individual is in a defeating situation social problem-solving strategies are key to reducing the likelihood that feelings of defeat are not translated into feelings of entrapment. As yet there are no studies specifically testing social problem-solving within the IMV model.

2.7.2 Rumination
2.7.2.1 Definition

Rumination can broadly be defined as enduring repetitive, self-focused thinking which is a frequent reaction to depressed mood (Rippere, 1977). It can be further described as a series of thoughts in response to a sad or negative mood. A consequence of rumination, therefore, is that the individual focuses more on the causes and consequences of their emotions, leaving them unable to focus on any other activities which may alleviate their low mood. Therefore rumination supports the lingering effect of low mood and indeed the former is a cognitive vulnerability that is linked to distress (O'Connor, O'Connor & Marshall, 2007).

In the last decade or so, how rumination is conceptualised has been refined. For example, Treynor, Gonzalez and Nolen-Hoeksema (2003) have emphasised that it is important to differentiate between brooding and reflective pondering, where the former is defined as 'moody, pondering, to think anxiously or gloomily' and reflective pondering (reflection) is

described as 'to engage in contemplation, to reflect, to ponder to deal with and attempt to overcome problems'.

2.7.2.2 Relationship with suicidality

In a systematic review, Morrison and O'Connor (2008) found that rumination was associated with suicidal ideation and behaviour. In addition Crane and colleagues (2007) found that suicidal behaviour in major depression is associated with reduced levels of reflection and an imbalance of reflection relative to brooding (i.e. suicide attempters more strongly endorse brooding than reflection). In this latter study, it is noteworthy that it was not the high levels of brooding but the depletion of reflection that was associated with increased suicide risk. This has led some authors to suggest that reflection may have protective properties, though the evidence base is still unclear.

2.7.2.3 Rumination and the IMV model

Within the IMV model, rumination is posited to be a threat to self moderator, meaning that a ruminative response will increase the likelihood that an individual will feel more trapped in a situation and feel as if there is no way to escape.

2.7.2.4 Relationship between rumination and social problem-solving

Rumination has been described as a method of coping with negative mood that involves self-focused attention (Lyubomirsky and Nolen-Hoeksema, 1993). In a later study by Lyumbomirsky and Nolen-Hoeksema (1995), they found that dysphoric students who ruminated generated the least effective solutions to interpersonal problems when using the Means End Problem Solving task (MEPS) compared to non-dysphoric students. This suggests that individuals with a ruminative coping style may not only experience more prolonged dysphoric reactions to problems but they may also be more negatively biased in their interpretation of these problems. Also, they may be more impaired in their ability to solve problems than people who lift their dysphoric moods through short-term distraction before evaluating their situations. Moreover, Watkins and Baracaia (2002) found in depressed individuals that poor problem-solving was a consequence of rumination. In a case-control study, Donaldson and Lam (2004) found that depressed individuals who scored high on trait rumination and experienced induced rumination were poorer in their problem-solving employing the MEPS than those who were lower on rumination. Their study highlights the importance of targeting both rumination and problem-solving during interventions.

Within the IMV model both rumination and social problem-solving are posited to be Threat to Self Moderators (TSM). As previously stated this means that they are both likely to moderate the defeat-entrapment relationship.

In summary, the research shows that there is a relationship between rumination and social problem-solving. The studies, in the main, have employed the Means End Problem-Solving procedure (MEPS; Platt & Spivack, 1975) when examining the relationship with rumination, and they have highlighted deficits in actual problem-solving ability. Despite the extant evidence, what is required is an examination of the different aspects of social problem-solving and their relationship with rumination.

2.7.3 Goal Adjustment

2.7.3.1 Definitions

Derived from self-regulation theory, goal adjustment focuses on situations where persistence in obtaining a goal may be maladaptive. Goal adjustment theorists consider how individuals respond to situations in which they are unable to attain their personal goals (Wrosch, Scheier, Miller, Schulz & Carver, 2003). Two components of goal adjustment have been identified as important: goal disengagement and goal reengagement. Goal disengagement refers to an individual's ability to relinquish unobtainable goals by discontinuing their effort and commitment towards a particular goal in response to a threat to goal pursuit. Goal reengagement, on the other hand, reflects an ability to discover and attempt to achieve alternative goals, following a threat to existing goal pursuit. Thus goal adjustment can be viewed as an adaptive process by which individuals give up on unachievable goals and re-direct the focus of their goal pursuit to alternative goals. These goal adjustment tendencies have been demonstrated to remain stable across a range of different activities (Wrosch et al., 2003).

2.7.3.2 Goal adjustment and suicidality

Previous cross-sectional research has indicated that poorer goal adjustment is associated with reduced wellbeing (Wrosch et al., 2003). For example, Wrosch, Miller, Scheier and Brun de Ponet (2007) argue that goal disengagement and goal reengagement have differential relationships with distress: people who are better able to disengage from unattainable goals and reengage with alternative goals may experience better health. Indeed, goal disengagement has been cross-sectionally associated with reporting fewer depressive symptoms (Wrosch et al., 2007). Notwithstanding, goal reengagement, but not

goal disengagement, has been cross-sectionally linked with purpose in life (Wrosch et al., 2003) and negatively associated with suicidal thinking (O'Connor & Forgan, 2007).

2.7.3.3 Goal adjustment and the IMV model

Within the IMV model, goal adjustment is viewed as a motivational moderator (MM) meaning that it will increase or decrease the likelihood that entrapment will translate into suicide ideation. In 2009, O'Connor, Fraser, White, MacHale and Masterton found, in a short-term follow-up study, that individuals who reported high levels of goal disengagement and low goal reengagement at baseline exhibited higher levels of suicide ideation at follow up compared to those who reported high goal reengagement and low disengagement. This suggests that in general, individuals who disengage from existing unattainable goals and do not engage in new goals are at elevated suicidal risk. However, in a later study that followed up suicide attempters two years later, O'Connor, O'Carroll, Ryan and Smyth, (2012) found that the relationship between goal reengagement/disengagement and suicidal behaviour was affected by age. Specifically, they found that the relationship between goal disengagement and self-harm is different for younger versus older adults. It seems that persistence with unattainable goals is maladaptive in young people who are capable of reengaging in new goals whereas in older people giving up on goals is maladaptive when goal reengagement capacity is low.

2.7.3.4 Goal adjustment and social problem-solving

There is a lack of research investigating the nature of the relationship between goal adjustment and social problem-solving therefore it is not known whether these factors are inter-related.

In summary the key unanswered question in relation to goal adjustment and social problem-solving are: what dimensions (aspects) of social problem-solving are associated with goal disengagement/reengagement and what is the nature of these relationships?

2.8 Aims of thesis and research questions

2.8.1 Thesis Aims

As stated in Chapter one, this thesis has three overarching aims which have been identified as areas within the social problem-solving and suicide research literature that require further exploration. The aims are:

    1. To investigate the relationship between social problem-solving, suicidality and other established suicide risk factors using the IMV as the conceptual framework.

2. To evaluate the utility of the social problem-solving measures which have been employed within suicide research.

3. To gain a clearer understanding of the relationship between social problem-solving, defeat and entrapment (central components of the IMV model) in the context of suicidal risk.

2.8.2 Overview of Research Questions

Social problem-solving is ubiquitously quoted as being a key risk factor for suicidal ideation and behaviour, yet there are many gaps in our knowledge. Importantly, a closer examination of the different dimensions of social problem-solving is required to highlight which particular features of social problem-solving are more strongly associated with suicidality than others.

Second, the research shows that there is a strong relationship between social problem-solving and rumination, however, what is missing from this area of research is an examination of the specific components of social problem-solving. An examination of the specific correlates of rumination and social problem-solving should enable a better understanding of the relationship between these two risk factors for suicidality. In addition, very little research has examined the relationship between social problem-solving and goal adjustment. Goal adjustment is also an important risk factor for suicidality and it is important to establish if there is any type of relationship between those two variables. Defeat and entrapment are key process variables within the IMV model of suicide behaviour; using the IMV model as a theoretical framework enables a more detailed analysis of how social problem-solving interacts with these other risk factors. For example, although social problem-solving is hypothesised to be associated with defeat, it is unclear whether social problem-solving is directly affected by defeat. In addition, as there is little known about the relationship between an individual's problem-solving appraisal and their problem-solving performance, this study should add to the social problem-solving literature.

As is noted in Chapter three, a major limitation in the social problem-solving and suicide research literature is that a wide variety of measures have been employed. This has limited the potential comparisons that could be made across studies and indeed many studies have adapted existing measures to meet their own study criteria. It is, therefore, important to review the most frequently employed measures within this research area. If a standardised

measure can be employed this will allow greater comparison across studies, which in turn would perhaps facilitate a more detailed understanding of this important risk factor within the aetiology of suicidal behaviour. An additional factor of note here is that the means end problem-solving task was developed in the seventies and therefore may not be appropriate for today's society. As this is a frequently used measure in suicide research it was felt that it would be appropriate to update this measure in the present research.

2.8.3 Overarching Research Questions

Although specific hypotheses are articulated in the later chapters, the following 7 questions are addressed across the empirical/reviews chapters of this thesis

1. What are the most commonly used measures of social problem-solving employed within suicide research?

2. What is the nature of the relationship between the different subscales of social problem-solving and suicidality?

3. Do individuals who report self-harm differ in their social problem-solving orientation and style from those who do not?

4. What is the relationship between the subscales of social problem-solving and rumination and goal adjustment?

5. Do the subscales of social problem-solving moderate the defeat-entrapment relationship following the framework of the IMV model.

6. What is the nature of the relationship between social problem-solving and defeat?

7. Do perceptions of defeat affect social problem-solving performance?

Chapter Three: Social problem-solving and suicidality in adults: A Systematic Review

3.1 Abstract

Aims

The aims were two-fold, firstly to investigate the relationship between social problem-solving and suicidality in adults and secondly to establish which measures of social problem-solving are routinely employed in suicide research

Method

A search of the international literature was conducted using the databases: PsychInfo (1970 – June 2014) and Web of Knowledge (1981 – June 2014). Medline is included in the Web of Knowledge search.

Results

The systematic search yielded 46 studies which were identified and categorised by study design and population. Taken as a whole an inverse relationship was found between social problem-solving and suicidality.

Conclusion

The review found clear evidence of a relationship between maladaptive social problem-solving and increased suicidality. The MEPS (Platt & Spivack, 1975) and the SPSI-R (D'Zurilla et al., 2002) are the two measures which yielded the most reliable results.

3.2 Introduction

As stated in Chapter 1 suicide is a major public health concern and in 2012 the UK lost 5981 people to death by suicide (Scowcroft, 2014). In general, rates are higher for males than females, except for China and Sao Tome & Principe, where more females kill themselves than males (World Health Organisation, 2011). Suicide is also not specific to one particular age group, and individuals can remain vulnerable across the lifespan (Windfuhr & Kapur, 2011).

3.2.1 Theoretical perspectives
To understand suicide risk, it is important to consider a wide range of perspectives and establish how different factors inter-relate. These perspectives comprise social, biological and psychological determinants of suicidal behaviour. Social factors include deprivation, culture and marital status. Biological factors can include the dysfunction of the serotonergic system (Mann, 2003) and the stress response system of the noradrenergic system and hypothalamic-pituitary-adrenal (HPA) axis (Mann & Currier, 2011; see also Chapter 1 for more detail). Psychological perspectives consist of research on personality factors, for example, perfectionism (O'Connor, 2007) and impulsivity (Mann, Waternaux, Gretcher & Malone, 1999) as well as cognitive factors including future thinking (MacLeod, Pankhania, Lee & Mitchel, 1997), autobiographical memory (Evans, Williams, O'Loughlin & Howels, 1999), and rumination (Morrison & O'Connor, 2008). This review will focus on a key psychological risk factor: social problem-solving (Speckens & Hawton, 2005). See O'Connor and Nock (2014) for an overview of the psychology of suicidal behaviour.

3.2.2 The nature of social problem-solving
Social problem-solving is an important factor in mental health and behavioural adjustment (Tisdale & Lawrence, 1986). Although it is well established that poor levels of social problem-solving are implicated in the aetiology of psychological distress and suicidal behaviour (Pollock & Williams, 1998; Speckens & Hawton, 2005), the mechanisms through which problem-solving increases suicidal risk are less well known (Speckens & Hawton, 2005). Moreover, it is not clear what aspects of social problem-solving are most

pernicious and whether this risk is uniform across adulthood, and equally so for men and women. Therefore the aim of this systematic review is to look closely at the relationship between social problem-solving and suicidality in adults.

3.2.3 Problem-solving definitions and terminology

Human problem-solving is among the highest and most complex form of human mental life (Davis, 1973). Problem-solving is a conscious process e.g. attempting to find solutions to problems like logic puzzles and mathematical problems. The process of interpersonal or social problem-solving, as a way to cope with life situations, is a cognitive behavioural process, which is inextricably linked to coping, decision-making and self-regulation. All these processes are entwined to enable an individual to negotiate everyday life (D'Zurillia & Nezu, 1990).

The social problem-solving and suicide risk literature has grown substantially in the last 30 years. However, aggregating these findings has been difficult because studies investigating the relationship between social problem-solving and suicidality have operationalized the key constructs in different ways across studies. For example, terms for problem-solving have included; interpersonal cognitive problem-solving (Spivak, Platt & Shure, 1976), interpersonal problem-solving (Shure, 1981), personal problem-solving (Heppner & Peterson, 1982) and social problem-solving (D'Zurillia & Nezu, 1990). For the purposes of this thesis the term social problem-solving will be used throughout when synthesising these studies. This term describes problem-solving as it occurs in the natural environment; it is not limited to any particular problem. The term encompasses impersonal problems (financial problems), intrapersonal problems (health, emotional and behavioural), interpersonal (relationship and family disputes) as well as community and societal problems. This term is developed from the model of social problem-solving originally introduced by D'Zurilla and Goldried (1971). The following definition of social problem-solving has been adopted; 'a cognitive-affective-behavioural process by which an individual attempts to identify or discover solutions to specific problems encountered in everyday living' (D'Zurilla & Nezu, 2007). Thus, this process is a conscious, rational, effortful, and purposeful activity, which can be viewed as a learning process, a general coping strategy and a method of self-control.

3.2.4 Social problem-solving and coping

As an adaptive coping strategy, social problem-solving can reduce psychological distress (D'Zurilla & Nezu, 2007). The process involves an individual appraising a situation as

stressful and therefore a problem to be solved, whereby coping strategies are activated within a problem-solving framework. This can result in positive outcomes such as a reduction in stress and negative outcomes which potentially increase distress. Problem-solving has also been investigated in many different areas of psychology, including brain injury (Rath, Langenbahn, Simon, Sherr, Fletcher & Diller, 2004), and schizophrenia (Vaskinn, Sundet, Hultman, Friis & Andreassen, 2009). Within each of these areas of psychology many different tools have been developed to measure problem-solving, however this review will focus on the measures that have been used in the field of suicide and suicidal behaviour research.

3.2.5 Measures of social problem-solving in suicide research

Although a number of measures exist for assessing problem-solving skills there are only a few that have been used to measure social problem-solving in the context of suicide risk (D'Zurilla & Maydeu-Olivares, 1995). These measures are often divided into process and outcome measures. Before evaluating how these measures relate to suicide risk, the main measures found in the review are described.

3.2.6 Process measures

Process measures directly assess an individual's attitudes, skills and abilities that enable the person to find effective and adaptive solutions to specific everyday problems (D'Zurilla, Chang, Nottingham & Faccini, 1998). Such measures often tap whether an individual has a negative orientation or a positive orientation towards problem-solving. This orientation component is the motivational part of problem-solving and it is often linked to Bandura's self-efficacy theory, the greater confidence you have, the more likely it is that you will be able to deal with the problem. Another component of process measures is a person's problem-solving skills, which includes problem definition, formulation, generation of alternative solutions, and solution monitoring and evaluation.

Four main process inventories were found to measure problem-solving in studies identified in this review; these were the problem-solving inventory (PSI, Heppner & Peterson, 1982), the social problem-solving inventory revised (SPSI-R; D'Zurilla, Nezu & Maydeu-Olivares, 2002), self rating problem-solving scale (SRPS; McLeavey, 1986) and the Utrecht coping list (UCL; Schreurs, Van de Willige, Tellegen & Brosschot, 1988).

3.2.6.1 Social Problem-Solving Inventory

The Social Problem-Solving Inventory–Revised, available in long and short form (SPSI-R: S; D'Zurilla et al., 2002), has been found to be a reliable and valid measure of problem-solving (D'Zurilla & Nezu, 1990). The long form is a 52-item, self-report Likert-type scale that is linked to a five dimensional model of social problem-solving: positive problem orientation (PPO); negative problem orientation (NPO); rational problem-solving (RPS); impulsivity/ carelessness style (ICS) and avoidance style (AS). Examples of items include 'I feel threatened and afraid when I have an important problem to solve' (NPO) and 'When my first efforts fail, I get very frustrated' (ICS). Participants rate the extent to which each statement is true on a five-point Likert-type scale.

Higher scores on negative problem orientation indicate a greater tendency to view a problem as a significant threat to well-being, often associated with pessimism, negative outcome expectancies, low self-efficacy and low frustration tolerance. Higher scores on positive problem orientation indicate a greater tendency to appraise a problem as a challenge rather than a threat, to report higher levels of optimism, positive outcome expectancies and self-efficacy and the belief that successful problem-solving takes times effort and persistence. A high score on rational problem-solving indicates that the person carefully and systematically gathers information and facts, identifies a variety of different alternative solutions (generation of alternative solutions), evaluates possible consequences, judges and compares the alternatives, chooses (decision-making) and then implements a solution. The SPSI-R is also available in short form consisting of a 25-item self-report questionnaire with the same five sub-scales as the long form. Each of the five sub-scales is designed to tap into one of the five constructs that form the theoretical model of social problem-solving (D'Zurilla & Nezu, 1990; see Appendix 1). Those subscales are: Positive Problem Orientation (PPO; 'Whenever I have a problem I believe it can be solved'); Negative Problem Orientation (NPO; 'I feel threatened and afraid when I have an important problem to solve'); Rational Problem Solving (RPS; 'when I have a decision to make, I try to predict the positive and negative consequences of each option'); Impulsivity/ Carelessness Style (ICS; 'When I am trying to solve a problem I go for the first good idea that comes to mind') and Avoidance Style (AS; 'I wait to see if a problem will resolve itself first, before trying to solve it myself'). Items were designed to reflect cognitive, affective or behavioural responses to real-life social problem-solving situations. Participants are asked to rate the extent to which each statement is true on a five-point Likert-type scale (0 = not at all true of me to 4 = extremely true of me).

Total scores are computed for each of the sub-scales as well as an overall total problem-solving score. Following reverse scoring of negatively worded items, higher scores on the total SPSI-R:SF are indicative of thoughts, emotions and behaviours typically associated with better social problem-solving ability.

3.2.6.2 Problem-Solving Inventory

Another commonly used process measure is the Heppner and Peterson (1982) problem-solving inventory (PSI). This is a 32-item questionnaire that yields a global score and three factor scores: (i) problem-solving confidence, defined as one's belief in one's problem-solving abilities; (ii) approach-avoidance style, defined as one's general tendency to approach or avoid problem-solving activities; and (iii) personal control, defined as one's beliefs in one's emotional and behavioural control while solving problems. Items are reverse scored so that lower scores reflect more positive perceptions of social problem-solving ability.

Heppner (2008) states that all factors and the total score have been found to have acceptable internal consistency estimates and stability coefficients across a number of populations and cultures. Nevertheless, the main critique of this measure is that it is not based on any theory or model (D'Zurilla & Chang, 1995). Although the PSI was originally generated to fit D'Zurilla and Goldfried's (1971) model, Heppner failed to find support for the five factor model so labelled the emergent factors as problem-solving confidence, approach-avoidance style and personal control. Heppner (2008) has also stated that the PSI is 'the most widely used problem-solving measure' however this measure has been in existence much longer than the SPSI-R and has been used extensively cross-culturally.

3.2.6.3 Utrecht Coping List

The Utrecht Coping List (UCL; Schreurs et al, 1988) is a 26 item scale that assesses characteristic style of reacting to problems, e.g. 'using a direct approach in order to solve a problem' and also situation specific coping, e.g. ' showing one's anger with those responsible for the problem'. Each item is positively scored on a four-point Likert-type response format measuring frequency of reaction ('seldom or Never', 'Sometimes', 'Often', 'Very Often'). Higher scores indicate greater use of the problem-solving approach. The scale is theoretically based on the assumption that types of coping are not mutually exclusive but operate in various combinations. Schreurs et al (1988) propose that

coping can be categorized into three main types: changing the situation or problem; changing the perception of the situation or problem; or reducing the arousal. The original factor structure of the UCL is composed of the following seven problem-solving dimensions (active handling (7-items); palliative reactions (4 items); avoidance/wait (3 items); seek social support (3 items); passive reactions (4 items); expression of emotions (4 items); and comforting cognitions (2 items). Separate scores on each dimension are provided rather than an overall composite score. McAuliffe et al. (2006) carried out a factor analysis that yielded five factors: active handling; palliative reaction; passive-avoidance, negative expression and problem sharing.

3.2.6.4 Self Rating Problem-solving Scale

Another process measure that has been used to measure social problem-solving is the Self Rating Problem-solving Scale (SRPS; McLeavey, 1986). This questionnaire consists of 25 items measured on a five-point Likert-type scale. Questions measure the participant's feelings and reactions to their everyday interpersonal problems, problem-solving strategies, and self-evaluation of problem-solving ability. McLeavey, Daly, Murray, O'Riordan and Taylor, (1987) reported an internal reliability score, of .75.

3.2.6.5 Summary

Questionnaires and self-report inventories are appropriate for the assessment of individual attitudes and beliefs about problem-solving ability. However, questionnaires measure perceived ability rather than actual ability and they may yield a biased perspective from the respondent (House & Scott, 1996). A performance test would be a more appropriate way to assess a person's abilities. Measuring problem-solving skills in a way that is closer to a real life problem-solving behaviour is what outcome measures endeavour to do (D'Zurilla & Maydeu-Olivares, 1995).

3.2.7 Outcome measures

Outcome measures assess an individual's problem-solving skills, in other words their problem-solving performance. This form of problem-solving measurement is concerned with the quality of solutions; it is a measure of an individual's performance and their effectiveness to solve problematic situations. The Means End Problem-solving Task (MEPS; Platt & Spivack, 1975) is one such outcome measure.

3.2.7.1 Means End Problem-Solving Task

Platt and Spivack (1975) designed the MEPS as a measure of one element of real-life problem-solving, and means-end thinking. The MEPS taps an 'individual's ability to orient himself to, and conceptualise a means of moving toward a goal.' The original MEPS consisted of ten items, which require the participant to imagine him or herself as the protagonist in a problem situation. Participants are asked to produce a story in which the protagonist successfully resolves the problem to achieve a specified ending.

Many authors have adapted the MEPS to suit their particular study participants. One study that has influenced subsequent studies in particular is Marx and colleagues (1992). Marx examined real-life problem-solving in relation to anxiety and depression, and asked participants to recall 'problematic events from their own life that were similar to the previously presented hypothetical MEPS scenarios'. Participants reported their past problem-solving behaviour and in retrospect an ideal strategy.

3.2.7.1.1 Means End Problem-Solving Task Limitations

Although widely used, there are limitations to the MEPS as a measure of problem-solving, as outlined by House and Scott (1996). These authors stated that despite many studies using this measure the results are difficult to interpret and to compare due to different methods of operationalisation. They also identified the following areas of contention within the task. First, there is a lack of realism in the problems, which may mean that the MEPS is a test of imagination rather than how a real problem is to be solved. To address this issue Marx et al. (1992) changed the instructions such that participants were asked to provide the ideal strategy. However, House and Scott (1996) suggest that this change does not go far enough. Second, the task also provides an ending to each problem which suggests that it is like being read a story and it may seem more like the participant is providing a narrative rather than actually trying to think of ways in which the problem can be solved. This also sets a predetermined outcome, which takes away the 'real life scenario' effect. Third, studies are not consistent in the use of second or third person format. The original manual presents the questions in the third person; however, some studies have used the 2nd person. These different ways of presenting the problems can have an impact on how the participant will respond to the vignettes. The presentation of a vignette may mean that an individual may not recognise it as a problem. What is a problem for one individual may not be a problem for another. In addition, the original version of the MEPS has a lack of qualitative scoring; to counteract this Marx et al. (1992) had second

raters evaluate participants' strategies for their effectiveness and used Likert type scales to record the effectiveness. This scoring method has been replicated and found to be effective in many studies since.

Finally, Linehan et al. (1987) stated that there is an issue with recording only relevant means. She states that an individual may come up with a solution to a problem but that this solution may be 'passive'. By being passive in a solution would mean that the protagonist would take no active part in solving the problem but may rely on the action of others to solve the problem.

3.2.8.2 Optimal Thinking Test

The Optimal Thinking Test (Platt & Spivack, 1977) is an outcome measure of interpersonal problem-solving ability that assesses respondents' capacity to generate alternative possibilities for overcoming real-life interpersonal problems. Optimal thinking is different from means-end thinking in that it involves the generation of alternative solutions to a given problem whereas means-end thinking involves thinking of sequential behaviours or steps in order to pursue a pre-specified goal. The measure has four hypothetical interpersonal problems together with instructions, which are presented to participants in printed format before being administered verbally by the interviewer. Participants are then asked to generate alternative solutions for solving each problem; verbal responses are then recorded verbatim. This measure is scored in terms of relevant options, irrelevant options or no options. These scores are then summed to provide a total score and then a relevancy ratio is calculated.

3.2.8.3 Problem Solving Task

The third measure, the Problem-Solving Task (Orbach, Bar-Joseph & Dror, 1990), was designed to assess quantitative and qualitative dimensions of the problem-solving process. The task consists of three dilemmas that the participant is asked to resolve by giving as many solutions as possible. Responses are analysed according to the following categories: versatility of solutions, reliance on self or reliance on others, active versus avoidant, relevance, positive versus negative (or no) effect, reference to the future and drastic solutions. The final score for each category consists of a mean score based on the number of solutions that the participant offers. Two independent researchers usually rate the solutions.

3.2.8.4 Awareness of Consequences test

The Awareness of Consequences test (Platt & Spivack, 1977) uses story-telling, where the protagonist is presented with four scenarios where they are exposed to a transgression. The participant is required to articulate what thoughts have entered their mind, they are then required to explain what they would do to deal with this issue. Two scores are obtained from the stories. Firstly, whether the participants thoughts included reference to transgressing and secondly, whether the participant weighed up the pros and cons to the scenario prior to their decision. The total score achievable for each scenario is eight, four for each question.

3.2.8.5 Divergent Thinking Task

Finally, the Divergent thinking task (Chand & Runco, 1992) contains three tasks, the first presents real-world problems that include problems in education establishments along with problems at work. Mraz and Runco (1994) also included problems relating to pregnancy and friends suffering from depression. The second task involves problem generation and the third task refers back to the first task and asks participants to select one problem and solve the problem. Tasks are scored on fluency, originality and flexibility.

3.2.8.6 Summary

In summary, this review found five outcome measures of social problem-solving, but by far the most frequently used was the MEPS. The difficulties with the MEPS are that it has been adapted on several occasions to improve its reliability and validity, and different studies use different variations, record different scoring or do not report all of the scoring. In the following section a systematic review of the relationship between social problem-solving and suicidality is reported. In light of Speckens and Hawton's (2005) systematic review of adolescent social problem-solving, our review is restricted to studies involving adult participants. Given that much of the interest in social problem-solving and suicide began in the 1970s with the publication of the MEPS (Platt & Spivack, 1975) our review focuses on studies published between 1970 and 2014. As authors have employed a range of different terms to refer to suicidal behaviour, we use the term that the authors employed throughout.

3.3 METHOD

3.3.1 Selection of Studies

A literature review of the three main psychological and medical databases was conducted: PsychInfo (1970 – June 2014) and Web of Knowledge (1981 – June 2014). Medline is included in the Web of Knowledge search. The following keyword searches were employed: (1) suicid* and problem-solving, (2) self-harm* and problem-solving. The PsychInfo search yielded 68 articles and the Web of Knowledge yielded 69, and after duplicates were removed there were 82 articles.   Next, all the abstracts were read to select the relevant papers based on the following criteria:

- Only original and published journal articles were included in the analyses.
- A measure of problem-solving was used in the assessment of social problem-solving.
- Suicidal ideation or behaviour was recorded for the participants.
- The study recorded the relationship between social problem-solving and suicidality.

The review yielded 46 papers in total which are presented in the proceeding sections, following O'Connor (2007): (1) cross-sectional studies investigating the relationship between social problem-solving and suicidality; (2) case control studies comparing groups of individuals which suicidal behaviour/ideation with control groups of clinical or non-clinical controls; and (3) longitudinal (prospective) studies of social problem-solving and suicidality.
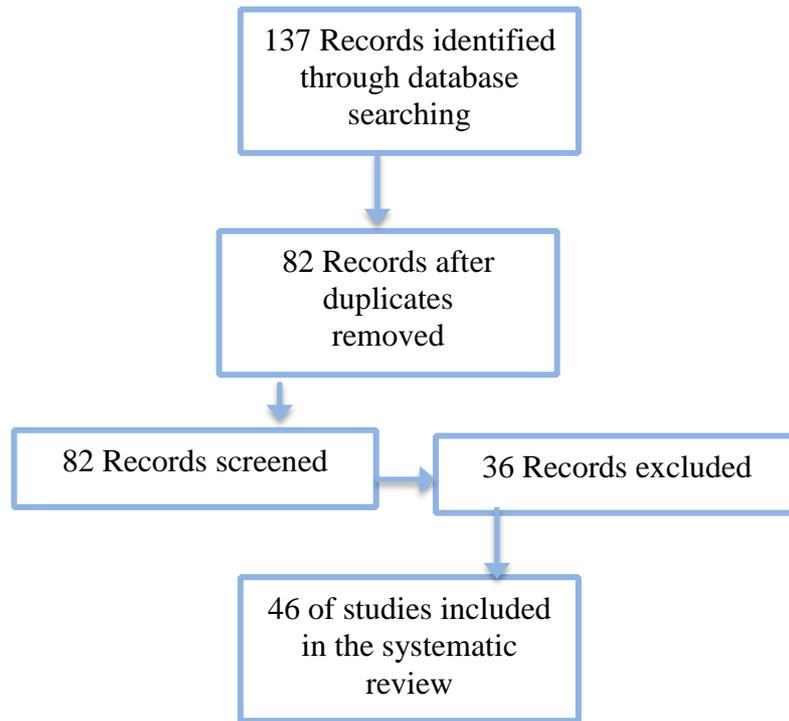
Figure 3.1 Prisma flow diagram of studies

3.4 RESULTS

3.4.1 Cross-sectional Studies

3.4.1.1 General Population Studies

Eleven of the studies were cross-sectional general population studies, all but one focused on university students (see Table 1). In each of the studies (n=4) which employed the Problem-solving Inventory (PSI; Clum & Febraro, 1994; Dixon, Heppner & Anderson, 1991; Wright and Heppner, 1991 and Zeyrek, Gencoz, Bergman & Lester, 2009) problem-solving and suicide ideation were positively correlated (this measure is reverse scored meaning that high scores reflect low problem-solving appraisal). In addition, Clum and Febraro (1994) found poor problem-solving confidence to be a predictor of suicidal severity and found the interactions of problem-solving confidence and approach-avoidance with stress to be predictive of suicidality. Dixon et al (1991) found that 1.4% of the variance in suicidal thoughts was accounted for by problem-solving with negative life stress and perceived ineffective problem-solving being independently associated with increased suicidal ideation and hopelessness. Wright & Heppner (1991) found no difference in problem-solving skills between college students with alcoholic parents and those without. However, when they combined the PSI scores of those two groups they found a correlation between problem-solving and suicide ideation. In Zeyrek et al's (2009) study, college students who scored higher on the suicide probability scale (SPS) perceived themselves as worse problem-solvers than those whose scores were lower on the SPS. In addition they found that problem-solving skills and hopelessness predicted suicide probability, although hopelessness was the stronger predictor.

Yang and Clum (1994) was the only cross-sectional study which employed the MEPS in the general population. Yang and Clum (1994) found significant correlations between the number of alternatives, pros and cons with suicide ideation but the number of relevant means did not independently predict suicide ideation.

The SPSI-R was employed in four studies (Chang, 2002, Chesin & Jeglic, 2012; Hirsch, Chang and Jeglic, 2012; Turner, Chapman and Layden, 2012). As is evident in Table 1, Chang (2002) found problem-solving to be significantly related to suicide ideation. Consistent with the later study, Hirsh et al. (2012) found that the total SPSI-R score was significantly positively associated (high scores reflect poor problem-solving ability) with life stress, loneliness and suicidal behaviours. In addition they found that loneliness moderated the association between social problem-solving and suicidal behaviours. Turner et al. (2012) investigated the functions of Non suicidal Self-Injury (NSSI) in association

with emotional and social functioning using the SPSI-R. This on-line survey found that negative problem orientation (NPO) and impulsive-careless style (ICS) were significantly positively associated with emotional relief, feeling generation, self-generation and self-punishment and AS to be significantly associated with emotional relief. However, using Bonferroni adjustments to avoid a type 1 error none of the correlations were significant. Finally, among Latino college students, Chesin and Jeglic (2012) found that suicidal behaviour was predicted by depression, hopelessness, loneliness, delinquency and low positive problem orientation, which accounted for 30% of the variance.

Another study (McAuliffe, Corcoran, Keely & Perry, 2003), using the self-rating problem-solving scale, found that in a sample of students, those who had suicide ideation with or without a plan had significantly poorer problem-solving scores than non-ideators.

Those students who were actively planning suicide had the poorest problem-solving scores which led the authors to conclude that suicidal ideation is associated with poorer problem-solving ability. Finally, Mraz and Runco (1994) employed the divergent thinking task and found that divergent thinking was significantly associated with suicidal ideation.

Table 3.1

Cross-Sectional Studies of Problem-solving and suicidality (n=17)

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source	Gender and Age			
General Population (N= 11)					
Chang (2002) USA	371 Students	72 males and 299 females. Mean age 23.5 Range 18 - 53	Adult Suicide Ideation Questionnaire (ASIQ; (Reynolds, 1991)	SPSI – R – SF (D'Zurilla et al., 2002)	Problem-solving was found to be significantly related to suicide ideation.
Chesin & Jeglic (2012) USA	554 Students	Mean Age 19 (SE 14)	Suicide Behaviour Questionnaire (Cole, 1988) BDI-II (Beck et al., 1996). Self-harm Inventory (Sansone, Wiederman & Sansone, 1998).	SPSI – R – SF (D'Zurilla et al., 2001)	Significant negative association found between suicide behaviour and PPO. PPO also found to predict suicide behaviour.
Clum & Febbraro (1994) USA	59 Students	42.4% male and 57.6% female. Mean age 19.8	SSI (Beck et al., 1979) MSSI (Miller et al., 1986)	PSI (Heppner & Peterson, 1982)	PSC significantly positively associated with suicide ideation and it was the only predictor of suicidal severity. Interactions of PSC x stress and AA x stress predictive of suicide ideation.

Table 3.1 Cont'd

Cross-Sectional Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source	Gender and Age			
Dixon et al. (1991) USA	Study 1 277 Students	134 males and 143 females.	SSI (Beck et al., 1979)	PSI (Heppner & Petersen, 1982).	The PSI was found to be significantly positively correlated with suicide ideation. 1.4% of the variance in suicidal ideation was accounted for by problem-solving.
Hirsh et al. (2012) USA	385 College Students	69% Female and 31 % male. Mean age 19.61 (SD 3.12)	Suicide behaviour questionnaire (Osman et al., 2001)	SPSI-R-SF (D'Zurilla et al., 2002)	Total score of the SPSI-R was significantly correlated with life stress, loneliness and suicidal behaviour. Loneliness and life stress were found to moderate the SPS-Suicidal behaviour relationship.
McAuliffe et al. (2003) Ireland	328 Students	134 male and 194 female. Mean age 19.6 (SD 2.2) Range 17 - 38	Suicide opinion Questionnaire	Self-rating Problem-solving Scale (McLeavey, 1986)	Found that ideators with or without a plan had significantly poorer problem-solving scores than non-ideators.

Table 3.1 Cont'd

Cross-Sectional Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source	Gender and Age			
Mraz & Runco (1994) USA	81 Students	29 male and 52 female Mean age 21 Range 18 - 46	SSI (Beck et al., 1979) SIS (Rudd, 1989)	Divergent Thinking Task (Chand & Runco, 1992)	Divergent thinking significantly associated with suicidal ideation.
Turner et al. (2012) Various countries	171 General population	161 Females Mean age 22.47 (SD 7.14) Range 16 - 54 11 Male (excluded)	Questionnaire for non-suicidal self-injury (Kleindienst et al., 2008)	SPSI-R (D'Zurilla et al., 2002)	NPO and ICS found to be significantly correlated with emotional relief, feeling generation, self-punishment and interpersonal influence. AS found to be significantly correlated with emotional relief.
Wright & Heppner (1991) USA	40 students 20 male Alcoholic parents (ACA) 20 female ACA	40 students 20 male non-alcoholic parent (non-ACA) 20 female non-ACA	SSI (Beck et al., 1979)	PSI (Heppner & Peterson, 1982)	Found no differences between groups in problem-solving skills. Nor was problem-solving found to predict suicide ideation.

Table 3.1 Cont'd

Cross-Sectional Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source	Gender and Age			
Yang & Clum (1994) USA	101 Students	73 male and 28 female Mean age 23.49 (SD4.48) Range 18 - 40	MSSI (Miller et al., 1986)	MEPS (Platt et al., 1971)	Number of relevant alternatives, pros and cons found to correlate with suicide ideation.
Zeyrek et al. (2009) Turkey	180 Students	70 male and 110 female Mean age 20.3 (SD 1.6) Range 17 - 26	SPS (Cull & Gill, 1982)	PSI (Heppner & Peterson, 1982)	Problem-solving and suicidal probability were significantly positively correlated. Found that problem-solving skills and hopelessness predicted suicide probability, hopelessness more so than problem-solving.
Clinical Population (N= 6) Dixon et al. (1994) USA	217 Outpatients	182 male and 35 female Mean age 22.38 (SD 2.95) Range 18 - 37	SPS (Cull & Gill, 1982) MSSI (Miller et al., 1986)	PSI (Heppner & Peterson, 1982)	Correlations found for all PSI factors and support for hopelessness mediating the problem-solving-suicide ideation relationship.

Table 3.1 Cont'd

Cross-Sectional Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source	Gender and Age			
Eskin et al. (2006) Turkey	121 Outpatients	52 male and 69 female Mean age 36.3 (SD 1.9) Range 17 - 63	Asked 3 questions developed for study about suicide ideation and 2 about suicide attempts.	PSI (Heppner & Peterson, 1982)	PSI found to predict suicide ideation and suicide attempts.
D'Zurilla, et al. (1998) USA	Study 2 100 general admission patients from a psychiatric hospital	30 male and 70 females mean age 37.1	Single item self-appraisal of suicide ideation	SPSI-R (D'Zurilla et al., 2002)	PPO was found to be significantly negatively associated with suicide ideation. NPO was found to be significantly positively associated with suicide ideation. Problem-solving accounted for 12.1 % of the variance in self-appraised suicide ideation.

Table 3.1 Cont'd

Cross-Sectional Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source	Gender and Age			
D'Zurrilla, et al. (1998) USA	Study 3 61 psychiatric patients	24 males and 37 females mean age 32.4	SPS (Cull & Gill, 1982)	SPSI-R (D'Zurilla et al., 2001)	A significantly negative association was found between PPO, RPS and suicide ideation. A significantly positive association was found between NPO, ICS, AS and suicide ideation. Problem-solving deficits accounted for 55.4% of the variance in suicidal risk.
Rudd et al. (1994) USA	100 psychiatric patients	82 male and 18 female Mean age 22.97 Range 18 - 37	Modified Scale for Suicide Ideation (Miller et al., 1986)	PSI (Heppner & Peterson, 1982)	Problem-solving appraisal was found to be significantly positively associated with suicide ideation and to predict suicide ideation.

Table 3.1 Cont'd

Cross-Sectional Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source	Gender and Age			
Rudd et al. (1996) USA	Total 332 psychiatric service personnel. 273 male and 59 female Mean age 22.7 (SD 2.7) 136 ideators 128 attempters 68 multiple attempters		MSSI (Miller et al., 1986) SPS (Cull & Gill, 1989)	PSI (Heppner, 1988)	Problem-solving was significantly correlated with suicide ideation and the multiple attempters were found to have more impaired problem-solving skills compared to attempters or ideators.

SPSI-R: Social problem-solving Inventory-Revised; PSI: Problem-solving Inventory; MEPS: Means End Problem-solving Task; SSI: Scale for Suicide Ideation; MSSI: Modified Scale for Suicide Ideation; SIS: Suicide Ideation Scale; SPS: Suicide Probability Scale; BDI-ii: Beck depression Inventory; PSC: Problem-solving confidence; AA: Approach avoidance style; PPO: positive problem orientation; RPS: rational problem-solving; NPO: negative problem orientation; ICS: impulsive-careless style; AS: avoidance style.

3.4.1.2 Summary

In summary, these studies taken together, suggest that problem-solving, when assessed by questionnaire is significantly related to suicide ideation, however, in the single study in which it was used, the MEPS did not predict suicide ideation. In addition, only three cross-sectional studies examined suicidal behaviour in the general population.

3.4.1.3 Clinical population Studies.

Six of the cross-sectional studies included clinical participants, four of which used the PSI scale. Dixon, Heppner and Rudd (1994) found that problem-solving appraisal had an indirect effect on suicidal ideation, where hopelessness mediated the relationship between problem-solving appraisal and suicide ideation. Eskin, Akoglu and Uygur (2006) found that problem-solving ability was more effective in predicting both suicide ideation and suicide attempts than the number of traumatic events. Importantly, in their sample Eskin et al. (2006) found that one unit of increase in negative assessment of problem-solving ability increased the risk of suicide ideation by approximately three fold in psychiatric patients. Rudd, Rajab and Dahm (1994) found support for problem-solving appraisal as a predictor of hopelessness and suicide ideation. In a later study, Rudd, Joiner and Rajab (1996) reported that individuals with multiple suicide attempts appraised themselves as having poorer problem-solving abilities than ideators and those who had made a single suicide attempt. They further reported that problem-solving was significantly associated with suicidal ideation.

In summary, these four studies yielded evidence in support of a problem-solving-suicide ideation relationship.

The two remaining clinical studies (D'Zurilla, Chang, Nottingham & Laccini, 1998; study 2 and 3) employed the SPSI-R. In one of D'Zurilla and colleagues' studies (study 2) positive problem orientation (PPO) was negatively associated with suicidal ideation whereas negative problem orientation (NPO) was positively associated with suicidal ideation. In addition, problem-solving deficits accounted for 12.1% of the variance in suicide risk. In their third study D'Zurilla et al. (1988) found a significant negative association between PPO, rational problem-solving (RPS) and suicide ideation and a significant positive association between NPO, impulsive/careless problem-solving (ICS), avoidance style (AS) and suicide ideation. Strikingly, problem-solving accounted for 55.4% of the variance in suicidal risk.

3.4.1.4 Summary

Each of the studies in this section employed process measures; four using the PSI and two the SPSI-R all of which yielded support for a relationship between social problem-solving and suicide ideation. Only one study (Eskin et al., 2006) employed a measure of suicide behaviour. Importantly all of the studies found a significant association between problem-solving and suicide ideation, however studies using the SPSI-R provided more detail regarding the nature of relationship in terms of the problem-solving style and orientation.

3.4.2 Case-Control Studies

3.4.2.1 General Population Studies.

Seven studies were with general populations, (Biggam & Power, 1999*a,b;* Clum, Yang, Febbraro, Canfield & Arsdel, 1996; Eidhin, Sheehy, O'Sullivan, McLeavey, 2002; Ivanoff, Smyth, Grochowski, Jang and Klein, 1992; Linda, marroquin and Miranda, 2012 and Schotte & Clum, 1982; see table 2). Six studies employed the MEPS, four of those were with a prison population[1] and two were with a student population. Biggam and Power (1999a) found in a prison population that those with a history of suicidality who were not currently suicidal did not display any differences in problem-solving ability compared to the control group. However, there was a difference in problem solving deficits between the group that were not currently suicidal and those that were currently suicidal. This suggests that problem-solving may be a state corollary of suicidality as well as acting as a potential trait like vulnerability factor. Biggam and Power (1999b) further found that high levels of psychological distress were associated with deficits in problem-solving and that the suicidal group had more deficits in problem-solving ability and higher levels of psychological distress than the victims of bullying, those on protection (inmates who have been removed from routine circulation and placed on protection for their own safety) and those in the control group. It is worthy of note that this later study also reported floor effects for an offender population in problem-solving ability.

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[1] For the present purposes, studies that included prisoners were included in the general population section rather than the clinical studies section.

Table 3.2

Case-Control Studies of Problem-solving and Suicidality (n=22)

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
General Population (N=7)					
Biggam & Power (1999a)* UK	61 inmates in total Mean age 18.8 (SD 1.2) Range 16 - 21		Engaged in DSH in previous 72 hrs. and placed in strict suicidal supervision.	MEPS (Platt & Spivack, 1975)	Among those with a history of parasuicide, those who were currently suicidal had more deficits in problem-solving ability than those who were not currently suicidal. No difference in problem-solving among those who were not currently suicidal as a factor of parasuicide history.
	15 parasuicide history and currently suicidal 21 history but not currently suicidal	25 with no history of suicide attempts nor currently suicidal			
Biggam & Power (1999b) UK	100 inmates in total Mean age 18.7 (SD 1.3) Range 16 - 21		No measure recorded Inmates on strict suicide supervision who are thought to be of immediate and high level of suicide risk.	MEPS (Platt & Spivack, 1975)	The suicidal group was found to have the most problem-solving deficits differing from the control group on irrelevant and passive means.
	25 placed on protection 25 currently under suicidal supervision 25 victims of bullying	25 in routine circulation regarded as reasonably well adjusted to prison life.			

Table 3.2 cont'd

Case-Control Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
Clum et al. (1996) USA	66 Depressed high suicidal college students Mean age 19.76 (SD 1.76) Range 18 – 24 32 male and 34 female	63 Depressed low suicidal college students Mean age 18.78 (SD 1.11) Range 18 – 24 19 male and 44 female	SSI (Beck et al., 1979) MSSI (Miller et al., 1986)	SPSI (D'Zurilla & Nezu, 1990) SPSI – R (D'Zurilla et al., 1994)	Correlations found between all the SPSO sub-scales. Found a difference in problem orientation between the DHS and the DLS groups with the SPSI only.
Eidhin et al. (2002) Ireland	46 Prisoners (all male) 15 Current suicide ideators, mean age 21.9 (SD 4.8) 12 past history of suicide Mean age 24.8 (SD 3.8)	19 no previous history Mean age 25.6 (SD 10.7)	SSI (Beck et al 1988)	MEPS (Platt et al., 1971)	Found no difference between 3 groups for generation of relevant means and irrelevant means. Control group produced more active means and current ideators produced more passive relevant means than the past suicide and control group.

Table 3.2 cont'd

Case-Control Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
*Ivanoff et al. (1992) USA	48 male inmates with parasuicide history. Mean age 31.4	43 male inmates with no parasuicide history Mean age 31.4	Prison suicide behaviour interview (PSBI; Ivanoff & Jang, 1991)	MEPS (Platt et al., 1971)	No significant differences between those with a history of parasuicide and those with no history in problem-solving performance.
Linda et al. (2012) USA	Total of 96 college students 73 female and 19 male 37 College students with a past suicide attempt	57 college students without a past suicide attempt.	Past history identified using questions form the young adult version of the Diagnostic Interview Schedule for children (Shaffer et al., 2000) BSS (Beck & Steer, 1991)	MEPS (Platt & Spivack, 1975)	Those with a history of a past suicide attempt had significantly higher passive means than those without a suicide attempt history. A two way interaction was found between life event stress and passive problem-solving as well as a three way interaction between past suicide attempt, life event stress and passive means to predict suicide ideation.

Table 3.2 cont'd

Case-Control Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
Schotte & Clum (1982) USA	175 Students 96 suicide ideators 47 male and 49 female	79 No suicidal thoughts 40 male and 39 female	SSI (Beck et al., 1979)	MEPS (Platt et al., 1971)	Poor problem solvers under high stress had higher suicidal intent than the control group.
Clinical Population (n=15)					
Dieserud et al. (2001) Norway	72 suicide attempters Mean 39.6 Range 18 – 75 43% male and 57% female.	51 outpatients with no history of suicidal behaviour. Mean age 40.7 Range 18 – 68 37% male and 63 % female	Suicide Ideation operationalized by means of a sum score index from item 9 of the BDI and item 19 of the abbreviated Hopkins Symptom Check List.	PSI (Heppner & Peterson, 1982) MEPS (Platt & Spivack (1975)	Found a significant difference between means on MEPS and that both the PSI and the MEPS correlated with suicide attempts and ideation.
Gibbs et al. (2009) USA	18 depressed older adults with recent suicide attempt (group A). 27 non-suicidal depressed older adults (group D).	19 non-depressed controls (Group C).	SSI (Beck et al., 1999) SIS (Beck et al., 1974) Suicide lethality scale (Beck et al., 1974)	SPSI – R – S (D'Zurilla et al., 2002)	Group A was found to have higher NPO than groups D & C. Groups A & D had lower scores on PPO than group C. Group A perceived themselves more impulsive/careless than D & C. Group A scored higher on dysfunctional SPS than other groups.

Table 3.2 cont'd

Case-Control Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
Howat & Davidson (2002) UK	18 Parasuicidal patients Mean age 71.67 (SD 6.54) 10 male and 8 female. 18 patients receiving treatment for depression Mean age 75 (SD 4.27) 7 male and 11 female.	22 community controls Mean age 77.27 (SD 6.56) 7 male and 15 female.	Parasuicide episode occurred in last 14 days.	MEPS (Platt & Spivack (1975). Modified for use with older adults.	Controlling for depression older adults with a recent episode of parasuicide were found to be poorer at generating relevant means than community controls, but were not significantly different from the depressed patients.
Jeglic et al. (2005) USA	63 attempters with a history of family suicide, 34 male and 39 female. Mean age 36.33 (SD 10.8).	117 without a history of family suicide, 51 male and 65 female Mean age 33.37 (SD 9.28)	SSI (Beck et al.,1997;1979) SIS (Beck et al., 1974) Scales for suicide ideations current and worst (Beck et al., 1997; 1979)	SPSI – R – SF (D'Zurilla et al., 2002)	NPO was found to mediate the relationship between family history and suicide attempts.
Kiavani (2005) IRAN	20 suicide attempters 8 men and 12 women, Mean age 28.05	20 healthy non-suicide patients, mean age 27.65 group matched for gender	Entry into study based on admission to psychiatric ward following a suicide attempt.	MEPS (Platt et al.,1975)	Significant differences in all MEPS measures between groups, in addition suicide group also took longer to complete the task.

Table 3.2 cont'd

Case-Control Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
Kiavani et al. (2011) IRAN	20 depressed patients with suicide ideation 10 male mean age 25.5 10 female mean age 29.7	20 depressed patients with no suicide ideation 10 male mean age 5.2 10 female mean age 28.7	SSI (Beck et al., 1979)	Culturally modified MEPS (Platt & Spivack, 1975)	Paired samples t-test found there to be differences in effectiveness and relevancy of scores in MEPS between the two groups.
Linehan et al. (1987) USA	123 Psychiatric patients 57 male and 82 female Mean age 28.9 Range 14 - 64	16 Hospitalised medical control group 9 male and 7 female Mean age 32.6 Range 13 - 61	SIS (Beck et al., 1974) Suicide behaviour questionnaire (SBQ; Linehan et al., 1983)	MEPS (Platt et al., 1971)	Parasuicidal patients had less active and greater passive means than suicide ideators and non-suicidal group. Interpersonal problem-solving deficits differentiated between parasuicidal and suicide ideators.
Maurex et al. (2010) Sweden	47 Female borderline Personality Disorder Patients Mean age 30.5 (SD 8.1)	30 women matched for educational level Mean age 25.5 (10)	Suicide Attempt Self-Injury (Linehan et al 2006). Only administered to the BDP patients.	MEPS (Platt & Spivack (1989).	Found a significantly lower number of means for the BDP group

Table 3.2 cont'd

Case-Control Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
McLeavey et al. (1987) Ireland	40 self-poisoners mean age 26.18 (SD 9.12), 25 female and 15 male.	40 psychiatric controls mean age 30.12 (SD 8.95), 23 female and 17 male. 20 non-patient controls mean age 23.65 (SD 6.52) 10 female and 10 male	Determined by hospital presentation.	SRPS Optimal thinking test Awareness of consequence test MEPS	The MEPS found the self-poisoning group from both controls on a number of indices of problem-solving.
Orbach et al. (1990) Israel	13 suicide attempters 16 suicide ideators Age range 18 – 45 Average age 31.	31 non-suicidal Age range 18 – 45 Average age 31.	Depression and Suicide Questionnaire (Zung, 1974)	Problem-solving Task (Orbach et al., (1990)	Suicide attempters and ideators showed less versatility, relevance, reference to the future; more negative affect and avoidant in the problem-solving categories.
Ozguven (2003) Turkey	83 crisis patients with suicide attempt in last week 64 crisis patients with no suicidal history	70 patients with no psychological problem	Suicidal index comprised of 3 questions relating to suicide	PSI (Heppner & Peterson, 1982) Turkish adaption (Sahin et al., 1983)	Found the crisis patients with suicidal history had poorer problem-solving skills than the other two groups.

Table 3.2 cont'd

Case-Control Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
Pollock & Williams (2001) UK	24 first time suicide attempters 10 male and 14 female	24 psychiatric controls 24 community controls	SSI (Beck et al., 1979)	MEPS (Platt et al., 1975)	Suicide attempters were found to have fewer relevant means and less effective solutions than the other two groups. They were also found to have more severe problem-solving deficits than psychiatric controls.
Schotte & Clum (1987) USA	50 suicidal patients 100 participants 72 male and 28 female Mean age 29.9 Range 20 – 48	50 non-suicidal patients	SSI (Beck et al., 1979)	MEPS (Platt et al., 1975)	Found that ideators have more deficits in social problem-solving. On the MEPS there was a sig difference between groups in the number of relevant means.
Szanto et al. (2012)	24 Depressed with suicide attempt (GP A) 38% male, mean age 68.2 (SD 8.7) 38 depressed non suicide (GP D) 34% male, mean age 70.2 (SD 7.7)	28 No psychiatric history (GP C) 61% male, mean age 69.6 (SD 6.3)	No measure, a previous suicide attempt was defined as a self-injurious act with the intent to die (O'Carroll criteria)	SPSI-R (D'Zurilla, et al., 1998).	Groups A & D had lower scores in PPO than group C. Group A was higher in NPO than group D and group C, with group D scoring lower than group C. Groups A & D lower in RPS than group C.

Table 3.2 cont'd

Case-Control Studies of Problem-solving and Suicidality

Study Country	Population		Suicide Risk	Social Problem-solving	Main Findings
	Cases	Controls			
Szanto et al. (2012) Cont'd					Group A had lower scores than group D and C on the ICS sub-scale. Groups A and D scored higher in AS than group C.
Williams et al. (2005) UK	19 who had experienced major depression and suicidal ideation Mean age 42.9 (SD 12) 15 history of major depression but no suicidal ideation. Mean age 43.6 (SD 9.2)	22 no history of major depression or suicidality Mean age 49.6 (SD 7.3)	BSS (Beck et al., 1988)	MEPS (Marx et al., 1992; Platt et al., 1975).	After a mood induction both suicidal and non-suicidal groups were less effective at problem solving. It was only after the mood induction that the effectiveness of the suicidal group was reduced compared to the controls.

SPSI-R: Social problem-solving Inventory-Revised; PSI: Problem-solving Inventory; MEPS: Means End Problem-solving Task; SSI: Scale for Suicide Ideation; MSSI:
*Prisoners are included in general population studies rather than clinical populations

Eidhin et al (2002) found that there was no significant difference between current ideators, those with a previous history of parasuicide (defined as an episode of self-harm irrespective of suicide intent) and those in the control group in the generation of relevant means and irrelevant means. However, despite a small sample size, they did find a difference between groups on the generation of active means, and in particular it was those in the control group who offered more active means than the inmates with a history of parasuicide. Ivanoff et al (1992) found no difference in problem-solving performance between those with a suicidal history and those without. They further stated that problem-solving deficits did not predispose male in-mates under stress to depression, hopelessness or suicidal ideation. Linda et al. (2012) examined passive and active means in a student population, they found that those students with a past suicide attempt had significantly higher passive means than those without a past history. They further investigated the moderating role of passive and active problem-solving along with suicide attempt history, on the relation between negative life stress and suicide ideation. The study found that there was a weaker relationship between life stress and suicide ideation at high and average levels of relevant problem-solving than at low levels for suicide attempters but not non-attempters. In addition, passive problem-solving buffered the effects of negative life stress on suicide ideation among suicide attempters. Also using a student population Schotte and Clum (1982) found that poor problem-solvers under high stress had higher suicidal intent than the non-suicidal controls. In addition they argued that decrements in problem-solving play a key role in the development of suicide ideation.

Finally, both the SPSI-R and the SPSI were employed by Clum et al (1998) to test the validity of both measures in the context of suicidality. This study yielded differences between a high suicidal group compared with a low suicidal group of college students with the SPSI but not with the SPSI-R.

To summarise, the main measure used in the studies that employed a case control design was the MEPS where all the studies found problem-solving skills to be deficient in suicidal groups relative to comparison groups. In addition, Clum et al (1996) also found differences in problem-solving skills in a suicidal group using the SPSI. Nevertheless, no difference in problem-solving skills was found in a suicidal group using the SPSI-R (Clum et al., 1996).

3.4.2.2 Clinical Population Studies.

The MEPS was employed in ten out of the 15 case-control clinical population studies (table 2). Howat and Davidson (2002) found that parasuicide patients were poorer at generating relevant means than depressed controls and a community control group. In

addition they posited that deficits in problem-solving exhibited in older adults cannot be entirely explained by depression. Kiavani (2005) also found there to be a significant difference in all the MEPS measures between the suicidal and control group; in addition they found that that the suicidal group took longer to respond to the task. A later study by Kiavani et al. (2011) which investigated the negative aspects of memory retrieval and social problem-solving in two groups of clinically depressed patients found that ideators had significantly lower scores on effective means and marginally lower scores on relevancy scores between ideators and non-ideators. Linehan, Camper, Chiles and Strosahl (1987) stated that interpersonal problem-solving deficits are a stable characteristic of parasuicide individuals. The authors of this study posited that if problem-solving deficits were caused by stress then all the parasuicide individuals and those with a history of parasuicide would have scored lower than individuals admitted to hospital for other reasons. Maurex, Lekander, Nilsonne, Andersson, Asberg and Ohman (2010) compared patients with borderline personality disorder (BPD) who had made at least two suicide attempts and normal controls. Employing the MEPS they found that there was a difference in the number of relevant means between the BPD and the control group. In addition, when they separated the BPD group into those who were currently depressed and those who were not currently depressed they found no difference in the number of relevant means generated by those patients, however, they did find a difference between the currently depressed BPD and the control group. Pollock and Williams (2001) found that suicide attempters reported fewer relevant means and less effective solutions than psychiatric patients. Schotte and Clum (1987) found strong support for their diathesis-stress model of suicidal behaviour and concluded that ideators had more deficits in social problem-solving than a non-suicidal group. In addition, although Williams, Barnhofer, Crane and Beck (2005) found no difference in the means produced by suicidal versus non-suicidal groups following a mood induction (assessed via the MEPS) they found that the effectiveness of the solutions decreased in the suicidal group only.

Dieserud, Roysamb, Ekeberg & Kraft (2001) used the MEPS along with the PSI, and found support for Schotte and Clum's diathesis-stress model of suicidality. The diathesis stress model posits that deficits in social problem-solving skills predispose an individual under chronic stress to depression, hopelessness and suicide ideation. The authors of this study also found correlations with the PSI and the MEPS with suicide attempts and ideation.

Interpersonal cognitive problem-solving tests devised by Platt and Spivack (1977). They found that the self-poisoning group along with the psychiatric control group differed significantly from the non-patient control group in the MEPS in the predicted direction, in addition the self-poisoning group differed significantly from both groups on this measure; these findings were also replicated using the optimal thinking test (Platt & Spivack, 1977). Those in the self-poisoning group also differed significantly from those in the other two groups on Platt and Spivack's second interpersonal problem-solving task, the awareness of consequences test (Platt & Spivack, 1977). Finally, the self-poisoning group differed significantly from the non-hospital control group but not the psychiatric control group on the self-rating problem-solving scale (SRPS; Platt & Spivack, 1977).

Three studies (Gibbs, Dombrovski, Morse, Siegle, Houck & Szanto, 2009; Jeglic, Sharp, Chapman Brown & Beck, 2005 and Szanto, Dombrovski, Sahakian, Mulsant, Houck, Reynolds & Clark, 2012) measured problem-solving with the SPSI-R SF. First, Gibbs et al (2009) measured problem-solving in three groups of older adults. Gibbs and colleagues reduced the data to dysfunctional and functional problem-solving factors and found that suicide attempters scored higher on the dysfunctional problem-solving factor and lower scores on the functional problem-solving factor, along with the depressed not suicidal group. Second, Jeglic and colleagues (2005) found that negative problem orientation mediated the relationship between family history of suicide attempts and number of suicide attempts. Their findings thereby suggesting that a family history of suicide attempts may lead to the development of a negative problem orientation which in turn increases risk of suicidal behaviour. Finally, Szanto et al. (2012) investigated social emotion recognition and social functioning with social problem-solving in late life depression. This study found significant differences between depressed individuals with and without a history of suicide attempt in in NPO and ICS. In addition they found that depressed patients with or without a past suicide attempt scored lower on PPO and RPS and higher in AS than those who were not depressed. In other words individuals who are depressed with a past suicide attempt are more likely to have higher scores on dysfunctional sub-scales of the SPSI-R. The PSI was employed in one other study (Ozguven, Soykan, Haran and Glencoz, 2003) wherein suicidal individuals in crisis who had a suicidal history exhibited poorer problem-solving skills than those without such a history.

Finally, the review yielded a single clinical, case-control study, which compared suicide attempters with ideators and controls whilst employing the problem-solving task (Orbach

et al., 1990). Orbach and colleagues found that attempters and ideators had lower scores in versatility of solutions, direct confrontation, relevance of solutions, positive affect and orientation to the future than controls. These findings show the distinct differences between the process of problem-solving between suicidal individuals and non-suicidal individuals.

3.4.3 Prospective/Longitudinal Studies

3.4.3.1 General Population Studies.

Only four general population studies met the criteria for inclusion (Chang, 1998; D'Zurilla, Chang, Nottingham & Laccini, 1998; Priester & Clum, 1993a; Priester & Clum, 1993b, see table 3), each recruiting from a student population. Two studies used the SPSI-R and found that negative problem orientation (NPO) was significantly positively associated with suicide ideation (Chang, 1998 and D'Zurilla et al., 1998). One study used the MEPS (Priester & Clum, 1993a) and a further study used the PSI (Priester & Clum, 1993b). Chang (1998) followed up participants four weeks later and found social problem-solving to be a more useful predictor of suicide potential than hopelessness. He also found partial support for the predictive utility of social problem-solving in accounting for suicidal risk, with problem-solving accounting for 8% of the variance beyond what was accounted for by ethnic status and perfectionism. However, problem-solving did not add incremental validity in predicting hopelessness again after accounting for ethnic status and hopelessness. D'Zurilla et al. (study 1; 1998) found positive problem orientation (PPO) to be significantly negatively associated with suicide ideation whereas impulsive/carelessness style (ICS) and avoidance style (AS) were found to be significantly positively associated with suicide ideation. Importantly, problem-solving deficits accounted for 30.5% of the variance in suicidal risk, when participants were followed up six weeks later after controlling for gender.

TABLE 3.3

Longitudinal/Prospective Studies of Problem-solving and Suicidality (n=9)

Study (Country)	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source and follow-up	Gender and Age			
General Population (N=4)					
Chang (1998) USA	Students 89 Asian American 96 Caucasian American 4 weeks later (80%)	38 Male 51 female 32 male 64 female Mean Age 19.1 and range 17 - 34	SPS (Cull & Gill, 1982)	SPSI-R (D'Zurilla et al., 2002)	NPO was significantly positively correlated with Suicide ideation. SPS was found to be a unique predictor of suicide potential but not hopelessness.
D'Zurilla, et al. (1998) USA	Study 1 283 Students 6 weeks later	98 Male and 185 female Mean age 18.7	SPS (Cull & Gill, 1982)	SPSI-R (D'Zurilla et al., 2002)	PPO was found to be significantly negatively correlated with suicide ideation. NPO, ICs and AS was found to be significantly positively correlated with suicide ideation. Problem-solving deficits accounted for 30.5% of the variance in suicidal risk.

TABLE 3.3 cont'd
Longitudinal/Prospective Studies of Problem-solving and Suicidality

Study (Country)	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source and follow-up	Gender and Age			
Priester & Clum (1993a) USA	282 University Students Approx 2 weeks later		MSSI (Miller et al., 1986)	Adaptation of MEPS (Schotte & Clum, 1987)	Relevant and irrelevant means correlated with suicide ideation; relevant means and negative consequences predicted suicide ideation at T2; and the interactions of no of relevant means and consequences with stress were significant predictors of suicide ideation.
Priester & Clum (1993b) USA	303 University Students Approx 2 weeks later		MSSI (Miller et al., 1986)	PSI (Hepner, 1986)	Only problem-solving confidence was significantly associated with suicide ideation. Appraisal of problem-solving skills was not found to predict suicide ideation at T2.

TABLE 3.3 cont'd

Longitudinal/Prospective Studies of Problem-solving and Suicidality

Study (Country)	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source and follow-up	Gender and Age			
Clinical Population (N= 5)					
Dieserud et al. (2003) Norway	50 suicide attempters from local general hospital. 18 months later	17 male (mean age 43) and 33 female (mean age 40)	SIS (Beck et al., 1974) Repeat suicide attempts	MEPS (Platt et al., 1975) PSI (Heppner & Peterson, 1982)	In univariate logistic regression only low self-appraised problem-solving predicted repetition of suicide attempt however when age, gender, previous attempts and suicide intent were controlled for interpersonal problem-solving also emerged as a significant predictor.
M[c]Auliffe et al. (2006) Multi-centre study	836 medically treated deliberate self-harm patients from 12 European regions 1 Year later		Structured interview	Utrecht Coping List (Schreurs et al., 1988)	Found that passive/avoidance was independently associated with repetition of deliberate self-harm and active handling coping style was associated with reduced risk of repetition.

TABLE 3.3 cont'd

Longitudinal/Prospective Studies of Problem-solving and Suicidality

Study (Country)	Population		Suicide Risk	Social Problem-solving	Main Findings
	Source and follow-up	Gender and Age			
McAuliffe et al. (2008) Ireland	152 Deliberate Self-harm patients from hospital A&E department. 1 year follow-up.	57 male and 95 female Age range 18 - 64	SIS (Beck et al., 1974) Deliberate self-harm episodes	Optimal Thinking Test (Platt & Spivak, 1977)	Found that if first time self-harmers had difficulty generating alternative options then they were more likely to self-harm within one year.
Pollock & Williams (2004) UK	24 Suicide attempters 24 non-suicidal psychiatric control group. 6 weeks later	10 male and 14 female 10 male and 14 female Age range 21 - 72	SSI (Beck et al., 1979)	MEPS (Platt et al., 1975)	The suicide attempter group responded with fewer means and less effective solutions than the matched psychiatric controls.
Schotte, Cools & Payvar (1990) USA	36 suicide ideators One-week later	14 male and 22 female Mean age 37.1	SSI (Beck et al., 1979)	MMEPS (Platt et al., 1975)	Found that reductions in mood and suicide intent are associated with improvements in problem-solving skills over time.

SPSI-R: Social problem-solving Inventory-Revised; PSI: Problem-solving Inventory; MEPS: Means End Problem-solving Task; SSI: Scale for Suicide Ideation; MSSI: Modified Scale for Suicide Ideation; SIS: Suicide Ideation Scale; SPS: Suicide Probability Scale; PSC: Problem-solving confidence; AA: Approach avoidance style; PPO: positive problem orientation; NPO: negative problem orientation; ICS: impulsive-careless style; AS: avoidance style.

Priester and Clum (1993a) used Schotte and Clum's (1987) modified version of the MEPS and found the number of relevant and irrelevant means were correlated with suicide ideation at time two. Regression analysis revealed that the number of relevant means and the number of negative consequences both significantly and uniquely predicted suicide ideation at time two beyond the variance explained by suicide ideation at Time 1 and stress. Finally, the number of relevant means by stress interaction, and number of consequences by stress interaction also emerged as significant predictors of suicide ideation. These findings suggest that problem-solving both alone and interacting with stress can predict symptoms of suicide ideation. This latter study tested the students six to eight days before their exams and then again two to eight days after their exams and found that the number of relevant means predicted suicide ideation.

Priester and Clum (1993b) employed the PSI and only found problem-solving confidence to be correlated with suicide ideation (2 weeks later) and did not find any further relationships between the two variables.

3.4.3.2 Summary

Studies employing the SPSI-R found that PPO is negatively associated with suicide ideation whereas NPO, ICS and AS are positively associated with suicide ideation. Social problem-solving was also found to be a predictor of suicide potential. In addition, problem-solving confidence (PSI) and the number of relevant means (MEPS) were negatively associated with suicide ideation.

3.4.3.3 Longitudinal Clinical Population Studies.

Five clinical studies met the criteria for a longitudinal study design (Dieserud, Roysamb, Braverman, Dalgard and Ekeberg, 2003; McAuliffe et al, 2006, 2008; Pollock & Williams, 2004 and Schotte, Cools & Payvar, 1990).

Three studies employed the MEPS (Dieserud et al, 2003; Schotte et al 1990 and Pollock & Williams, 2004). Schotte et al. (1990) found improvements in mood and suicide intent over one week were associated with improvements in interpersonal problem-solving skills. They further suggested that problem-solving deficits appear represent more of a state vulnerability rather than trait vulnerability. Finally, Pollock and Williams (2004) found in their study that suicide attempters displayed fewer problem-solving abilities than matched

psychiatric controls. This difference also persisted despite mood change, in other words problem-solving deficits could not be accounted for by changes in mood.

Using the MEPS and the PSI, Dieserud et al. (2003) found no significant correlations between problem-solving and suicidality. However, they found that self-appraised problem-solving capacity predicted repetition of suicide attempt, and when previous attempts, suicide intent, gender, age and medical risk were controlled for, self-appraised problem-solving capacity and interpersonal problem-solving skills emerged as significant predictors of suicide attempts. This suggests that after a suicide attempt, if an individual appraises their problem-solving capacity as poor then they are at increased risk of repeating their attempt compared to someone who has more confidence in their problem-solving confidence.

McAuliffe et al (2006) investigated problem-solving in a multi-centre study with a sample of medically treated deliberate self-harm patients, of which 59% were repeaters. Using the five dimensions of the Utrecht Coping List (UCL; Schreurs et al, 1988), they found that repeaters reported higher passive-avoidance problem-solving style and there was a significant association between passive-avoidance and active handling of problem-solving and self-harm repetition. In addition these authors also found that repeaters scored higher on negative expression and that the pernicious effects of the latter were particularly marked in male repeaters compared to non-repeaters; and that high active handling was associated with a lower risk of repetition.

In 2008, McAuliffe et al completed a further study of hospital treated self-harm patients, this time using the Optimal Thinking Test (Platt & Spivack, 1977). They found that patients presenting for the first time with an episode of deliberate self-harm who have difficulty generating alternative options to problems were more likely than repeaters to engage in further self-harm within a year.

3.4.3.4 Summary
Studies which employed the MEPS found that improved mood relates to improved problem-solving and that individuals with a history of suicide attempts are more likely to have fewer and less effective means. Whilst the Optimal thinking task found that individuals who reported self- harmers generated fewer alternative options and the Utrecht coping list found that avoidance was independently associated with repetition of self-harm.

Comparing the results of different measures highlights that social problem-solving is found to be dysfunctional in individuals with a history of suicide behaviour.

3.4.4 Relationship between social problem-solving and suicide ideation or behaviour
Given the heterogeneity of the sample composition and inconsistent variable operationalization, to aid the reader, Table 3.4 summarises whether there was evidence for *any* significant relationships, between social problem-solving and suicide ideation and behaviour in each study as a function of problem-solving measure. From this table it is clear that the most commonly used measure across all studies was the MEPS and that the majority of evidence for a relationship between problem-solving and suicidality is derived from MEPS studies. Although the PSI was the most frequently used measure in cross-sectional studies, only one of these studies investigated its relationship with suicidal behaviour (rather than ideation). Indeed more generally it is evident that relatively few studies have investigated the relationship between the interpersonal problem-solving and suicide behaviour, irrespective of study design.

Table 3.4: Study design with measures recorded and results found

Study Design / Measure	Suicide Ideation	Suicide Behaviour
Cross-Sectional – General Population		
MEPS	√	
PSI	√ √ √ √	
SPSI-R	√	√ √ √
Other	√ √	
Cross-Sectional - Clinical		
PSI	√ √ √ √	√
SPSI-R	√ √	
Case-Control – General population		
MEPS	√ √ X	√ √ √
SPSI-R	√ X	
Case-control - Clinical		
MEPS	√ √ √ √√	√ √ √ √ √ √
PSI	√ √	√
SPSI-R	√	√ √
Other	√	√ √ √√
Longitudinal – General population		
MEPS	√	
PSI	√	
SPSI-R	√ √	
Longitudinal - Clinical		
MEPS	√	√ √
PSI		√
Other		√ √

√ = Each tick represents an association observed between a measure of social problem-solving and suicide ideation or behaviour in a specific study.
X = Each cross represents a failure to find any such association (i.e. the authors report non-significant associations between suicidality and social problem-solving. As some studies employed more than one measure of problem-solving and may have measured behaviour and ideation the number of ticks and crosses exceed the number of studies reviewed.

3.5 Discussion

3.5.1 Social problem-solving and suicidality

This systematic review demonstrates that poor problem-solving is associated with increased suicidality; yet the exact nature of the relationship is somewhat more difficult to decipher. As can be seen in Table 4, a relationship between problem-solving and suicidality was found in over 99 % of the studies, although the majority of the evidence is in support of the relationship between social problem-solving and suicide ideation (n= 32) rather than behaviour (n=16; note that six studies investigated ideation and behaviour). Needless to say absence of evidence does not equal evidence of absence. Indeed in the few studies which did investigate the relationship between social problem-solving and suicidal behaviour, all but one yielded a significant association. However, a detailed synthesis of the findings is hampered by the disparate measures of both problem-solving and suicidality employed across the studies.

3.5.2 measures of social problem-solving

The most commonly used problem-solving measure was the means end problem-solving task (MEPS; Platt & Spivack, 1975), which as an outcome measure, attempts to tap into an individual's actual problem-solving ability. In this review 21 out of 46 studies used this measure, two of which (Dierserud et al., 2001; 2003) employed the MEPS alongside the problem-solving inventory, one study employed three additional problems-solving measures (McLeavey et al., 1987) and three studies employed a modified version of the means end problem-solving task. Of the 21 studies using the MEPS, 16 were case-control studies and ten were clinical population studies. It is noteworthy that four of the general population studies were carried out with prison populations. Four studies employed the MEPS in a longitudinal design, three of which utilised clinical populations and one study used the MEPS in a cross-sectional design with a general population.   Taking the findings of these studies together, there is clear evidence that poor problem-solving ability is associated with increased suicide risk. This is further highlighted in Table 4; performance on the MEPS differentiated participants with and without suicidal history in the general population studies. Table 4 also shows that ten studies using the MEPS found a positive relationship between suicide ideation and social problem-solving whereas only one yielded non-significant results. Furthermore, the 11 studies which investigated suicidal behaviour yielded a significant problem-solving-behaviour relationship.

Closer inspection of the MEPS studies suggests that individuals who are suicidal report less relevant means, are more passive in their problem-solving strategies (Linehan et al, 1987), and are less effective in their problem-solving strategies (Marx et al, 1992). It is important to note that, although there was good case-control evidence, only one study (Dieserud et al 2003) found problem-solving ability to be a predictor of suicidal behaviour, after controlling for related factors. Further to this, Dieserud et al (2001) suggest that problem-solving forms a distinct cognitive pathway to suicidality which is separate from the depression and hopelessness pathways.

As noted above, one study that employed the MEPS did not yield significant findings. Ivanoff and colleagues (1992) failed to find any significant differences between case and control groups, however they suggest that their null findings were confounded by floor effects. Dieserud et al (2003) also reported conflicting results; they found some predictive utility of problem-solving ability yet found no correlation between the MEPS and suicide ideation. It is also worthy of note that they reported a composite MEPS score rather than reporting the separate components of the MEPS.

Although the problem-solving inventory (PSI) was a commonly used process measure (n=12), yielding significant correlations between problem-solving and suicide ideation in all but one study (Dieserud et al, 2003), the main association across the studies was between the *total* problem-solving score and suicide ideation. The only construct within the PSI to yield significant findings with suicide ideation was problem-solving confidence; this was found in three studies (Clum & Febbraro, 1994; Dixon et al 1991; Priester & Clum, 1993b). In addition the studies using the PSI measure were predominantly testing whether problem-solving predicted suicide ideation and whether its relationship with suicidality was direct or indirect. In sum the results are mixed with this measure due to inconsistencies in scoring the PSI. Conversely the 12 studies using the social problem-solving inventory (SPSI-R; D'Zurilla, Nezu & Maydeu-Olivares, 2002) yielded more consistent findings. Interestingly in comparison to the PSI, studies using the SPSI-R mainly tested the individual constructs within the scale, not just the total score and all yielded significant correlations with suicide ideation. This measure also predicted a significant amount of the suicide ideation variance across a number of studies. The SPSI-R may be a more useful measure than the PSI, as it allows one to tease apart the components of problem-solving that are dysfunctional and investigate their relationship with suicidality in more detail. Studies suing this measure consistently showed that

negative problem orientation and impulsive behaviour combined appear to be the most pernicious aspects of problem-solving in relation to suicidality. Therefore this measure appears to yield more detailed analysis in relation to the areas of problem-solving that are a risk factor in suicide ideation.

Five studies in this review used other less commonly reported problem-solving measures. All of these studies found a positive relationship between problem-solving and behaviour. However, as the findings from these studies tend not to have been replicated it is difficult to generalise from them.

3.5.3 Study designs

The majority of the studies in this review were case-control (n=22) in design with nine longitudinal and 19 cross-sectional studies. In addition, most case-control studies employed the MEPS and found a difference in problem-solving ability in individuals who have high levels of suicide ideation versus controls. Another noteworthy point relating to the types of studies concerns the target populations. This review yielded 22 general population studies, although four of these were conducted with prisoners; a further 26 studies were conducted with clinical populations. More studies are required, therefore, to examine problem-solving in diverse general population samples which go beyond undergraduate student populations.

3.5.4 Future research

A question that is of considerable importance both theoretically as well as clinically is whether problem-solving is a trait vulnerability factor or whether it is state dependant? Schotte and Clum (19882; 1987) suggest that problem-solving conveys trait vulnerability to suicidality and many studies have provided evidence to support this theory (Dixon et al., 1991; 1994 and Rudd et al., 1994 and Priester & Clum, 1993b). However, there is some evidence that problem-solving may exert short-term state-dependent effects as well. For example, Biggam and Power (1999a) found that problem-solving performance is poor in a crisis and can rapidly recover after the crisis, which led Williams et al (2005) to suggest that the diathesis stress model is therefore insufficient to explain the nature of the relationship between problem-solving and suicidality. Specifically, Williams et al (2005) found that individuals who had reported an episode of depression in the past experienced significant changes in their problem-solving ability after a mood induction suggesting that problem-solving ability is also a state vulnerability factor. More research is required to

determine the conditions under which problem-solving exerts state versus trait-like influences on suicide risk.

As noted above, population differences were evident across all study designs, only one third (n=7) of the case-control studies looked at general population participants. By contrast, only six out of 17 of the cross-sectional studies were with clinical samples and all of the general population studies investigated student populations. It therefore is not clear the extent to which poor social problem-solving is a major risk factor in the general population beyond students.

The majority of the research identified in this review focuses on Western countries. Most studies were conducted in the USA (n=21), followed by six studies conducted in the UK, four in Ireland and three in Turkey, with few studies conducted in other countries. Chang's (2002) study of Asian Americans and Caucasian Americans highlights the potential importance of cultural factors. He found that Asian Americans had higher negative problem orientation and more impulsive/careless style than Caucasian Americans, yet he found no significant differences in the functional problem solving styles of positive orientation and rational problem-solving. More studies are required, therefore, to investigate social problem-solving and suicidality in non-Western societies.

The majority of study participants were female, with only one study investigating gender differences (McAuliffe, 2006). This study employed the UCL (Schreurs et al., 1988) and found that males had lower scores in the problem-sharing factor than females, suggesting, that males are less likely to talk about their problems. Given the marked difference in suicide rates in men versus women in most Western countries, detailed research into potential gender differences is long overdue. The age range in general population studies was from 16 to 53 years and in clinical population studies 17 to 72 years. It is worthy of note that two clinical population studies focused their research on older adults and general population studies predominantly used student populations which are traditionally a younger population group.

The findings of this review have important clinical implications to be considered. The main finding appears to be the utility in looking at the different areas of problem-solving, this is highlighted in the use of the SPSI-R which investigates problem orientation and problem-solving skills. These cognitive and behavioural strands of problem-solving are

critically linked to risk and protective factors in suicidality. This means that in relation to problem orientation, if one is positive in their ability to solve a problem it can be construed as a protective factor. Linking this to problem-solving skills training within a clinical intervention can induce confidence in future problem-solving. Alternatively without any skills or confidence in their ability studies have shown that this leads to higher levels of hopelessness which in turns leads to suicide ideation.

3.5.5 Limitations and suggestions for future research

This review highlighted several limitations to consider when examining the relationship between problem-solving and suicidality. The first limitation is in relation to the measurement of suicidality and problem-solving. The 46 papers in this review used 22 different measures of suicide ideation and behaviour and some studies (n=6) used no measure but compared individuals with and without a history of suicidal behaviour. The most commonly used measures for suicide ideation were the scale for suicide ideation (SSI; n=14; Beck et al, 1979), the Miller suicide ideation scale (n=8; Miller et al, 1986) and the suicide probability scale (n=6; Cull & Gill, 1982). Many studies utilized answers to pre-determined questions about prior behaviour or thoughts to identify group membership. We propose that a standard reliable and valid measure of suicide ideation and behaviour should be employed. The SSI is the most commonly used measure for ideation however there is no clear measure that is commonly employed to measure suicide behaviour; the most common method in this review is past suicide behaviour which could be recommend to ensure better comparison across studies. Intent was measured either by using the Beck et al (1974) suicide intent scale, the MSSI (Miller et al, 1986) or some studies designed or adapted questionnaires to assess intent. Some studies did not measure intent, these were studies that employed no measure of suicidality and participants were categorised based on previous suicide history.

Another difficulty when comparing studies was the wide range of measures employed to assess problem-solving. There were nine different measures of problem-solving used in this review, the most common of which was the MEPS. This outcome measure has several potential limitations, which are worth noting. First, the number of questions/scenarios used across studies varies from three to ten with little justification for the selection of questions/scenarios. In addition, studies also varied in how the questions were worded. Some studies asked participants to imagine a hypothetical scenario whereas other studies ask the participant to specifically imagine encountering the problem themself. This

variation is problematic when one attempts to compare the results of studies that used different versions of the MEPS. Based on the findings, five appears to be the number of scenarios most frequently used, the most frequently used scenarios are difficult to identify because not all studies report which scenarios were used in the study. Finally, scoring, again this is various throughout studies but it seems that areas that are pertinent to findings are active/passive means, number of relevant means and effectiveness of means.

Given the relative absence of research investigating social problem-solving and suicidal behaviour (as distinct from suicide ideation), particularly with general populations it is suggested that this area should be explored further. In addition, given the dearth of prospective studies, more longitudinal studies are essential in order to examine the predictive utility of problem-solving and suicidality. Future research should also investigate the specific constructs of problem-solving and how an individuals problem-solving style is affected by psychological distress.

Finally, it is important to highlight a major limitation to the methodology of this review. The studies within this systematic review were not examined in relation to their methodological quality, therefore the results from each study were compared equally. The omission of a quality assessment framework examining the methodological rigour of each study, therefore means that this review fails to highlight the main findings from the strongest studies, for example longitudinal or case-control in comparison to cross-sectional studies. In addition this review failed to investigate if the literature had controlled for the compounding impact of psychotropic medication.

3.5.6 Conclusion

This review has found clear evidence of a relationship between poor social problem-solving and increased suicidality. From the evidence to date, the MEPS and the SPSI-R are the two measures that most reliably yield an association between problem-solving and suicidality. However, there are a number of significant gaps within the literature, in particular more studies using a longitudinal design and measuring suicidal behaviour are urgently required.

This results of this review guides the rest of the thesis in terms of the measures of social problem-solving that are employed, i.e., the SPSI-R and the MEPS. It also forms the basis for the need to update the MEPS, which is the basis for the research reported in Chapter 6.

Chapter Four: Methods

4.1 Outline

The following chapter outlines the measures employed throughout this thesis. As there is an overlap in the measures used throughout the studies, this chapter aims to avoid unnecessary repetition later in the thesis.

4.2 Introduction

Individual empirical chapter's within this thesis contain a brief summary of the measures used alongside the procedure employed. Cronbach's alpha levels (measure of internal consistency) and Kappa coefficients (measure of inter-rater reliability) are reported by study within each experimental chapter, as appropriate. Table 4.1 provides a summary of the measures used within each individual study; this is followed by a detailed description of each of the measures in turn. In addition, each measure is included in the appendices (Appendix 1 to Appendix 11).

As the methods employed for revising the MEPS do not overlap with any other study in this thesis, they are described in full within the relevant empirical chapter (Chapter 6). Finally, this chapter ends by describing how each of the studies in this thesis relate to each other.

4.3 Measures

4.3.1 Social Problem-Solving

The Social Problem-Solving Inventory–Revised: Short Form (SPSI-R: SF; D'Zurilla, Nezu & Maydeu-Olivares, 2002) is a 25-item self-report questionnaire with five sub-scales each of which is designed to tap into one of the five constructs that form the theoretical model of social problem-solving (D'Zurilla & Nezu, 1990; see Appendix 1). Those subscales are: Positive Problem Orientation (PPO; 'Whenever I have a problem I believe it can be solved'); Negative Problem Orientation (NPO; 'I feel threatened and afraid when I have an important problem to solve'); Rational Problem Solving (RPS; 'when I have a decision to make, I try to predict the positive and negative consequences of each option'); Impulsivity/ Carelessness Style (ICS; 'When I am trying to solve a problem I go for the first good idea that comes to mind') and Avoidance Style (AS; 'I wait to see if a problem will resolve itself first, before trying to solve it myself'). Items were designed to reflect cognitive,

affective or behavioural responses to real-life social problem-solving situations. Participants are asked to rate the extent to which each statement is true on a five-point Likert-type scale (0 = not at all true of me to 4 = extremely true of me).

Total scores are computed for each of the sub-scales as well as an overall total problem-solving score. Following reverse scoring of negatively worded items, higher scores on the total SPSI-R:SF are indicative of thoughts, emotions and behaviours typically associated with better social problem-solving ability.

Table 4.1: Summary of measures used in each study

	Measures at Time One	Measures at Time Two
Chapter 5 Prospective Study	Social Problem-solving (SPSI-R-SF) Rumination (short RSQ) Impulsivity Goal Adjustment (GAS) Defeat Entrapment Rescue Hopelessness (BHS) Stress Depression (BDI-II) Suicide ideation (SPS)	Stress Hopelessness Depression Suicide Ideation Self-harm
Chapter 6 Revising the MEPS	MEPS (Platt & Spivack, 1975) MEPS-R	
Chapter 7 Testing MEPS-R Face to face	Social problem-solving (SPSI-R-SF) Stress Depression (BDI-II) Defeat MEPS-R	
Chapter7 Testing MEPS-R On-line	Social problem-solving (SPSI-R-SF) Stress Depression (BDI-II) Defeat Suicide ideation (BSSI) MEPS-R	
Chapter 8 Experimental Study	Social problem-solving (SPSI-R-SF) Stress Depression (BDI-II) Defeat Entrapment Suicide ideation (BSSI) Self-harm MEPS-R	

In relation to the specific constructs, higher scores on positive problem orientation (PPO) indicate a greater tendency to appraise a problem as a challenge rather than a threat and the belief that successful problem-solving takes time, effort and persistence. Higher scores on the rational problem-solving scale (RPS) indicate that the person carefully and

systematically gathers information and facts, identifies a variety of different alternative solutions (generation of alternative solutions), evaluates possible consequences, judges and compares the alternatives, chooses (decision-making) and then implements a solution while carefully monitoring and evaluating the outcomes (solution implementation and verification). Both of the latter constructs are indicative of functional or good problem-solving whereas low scores on NPO, ICS and AS are indicative of poor social problem-solving function.

In other words, lower scores on a negative problem orientation (NPO) indicate a greater tendency to view a problem as a significant threat to well-being, pessimism, negative outcome expectancies and low self-efficacy and low frustration tolerance.

Low scores on the impulsivity/carelessness style scale (ICS) indicate that a person scans few solution alternatives; consequences and solution outcomes emerge quickly, carelessly and unsystematically. A low score on avoidance style (AS) indicates that a person prefers to avoid problems rather than confront them and attempts to shift the responsibility for solving their problem to others (D'Zurilla et al., 2002). The reliability and validity of the scale has previously been demonstrated by Hawkins, Sofronoff and Sheffield (2008) and D'Zurilla et al. (2002).

4.3.2 Rumination

The Rumination Response Scale (RRS) of the Response Style Questionnaire (RSQ) (Nolen-Hoeksema & Morrow, 1991) consists of 22 items, which record the extent to which individuals repeatedly focus on the causes, meanings, and consequences of their negative mood. The RRS is also available as a 10-item measure (RRS short; Davies & Nolen-Hoeksema, 2000) which is employed in this study to measure rumination (see Appendix 2). Employing a factor analysis (Treynor, Gonzalez & Nolen-Hoeksema, 2003) identified two separate sub-scales. The first, brooding, consists of five items that assess the extent to which individuals passively focus on the reasons for their distress (e.g., 'how often do you think about a recent situation, wishing it had gone better?'). Reflective pondering or reflection, the second scale also consists of five items and assesses the degree to which individuals engage in cognitive problem-solving to relieve their distress (e.g., 'How often do you analyse recent events to try to understand why you are depressed'). Respondents are asked to indicate how often they think or do each item from almost never (1) to almost always (4). Test-retest of the reflective and brooding components of rumination over one

year has been demonstrated (Treynor et al., 2003).

4.3.3 Goal Adjustment

The Goal Adjustment Scale (GAS: Wrosch, Scheier, Miller et al., 2003; see Appendix 3) is a 10 item instrument that consist of two subscales: (i) goal disengagement (four items) and, (ii) goal reengagement (six items). Goal disengagement measures one's perceived difficulty in reducing effort and relinquishing commitment toward unobtainable goals (e.g., 'it's easy for me to reduce my effort toward the goal'). The reengagement subscale taps one's perceived ability to reengage in other new goals if they face constraints on goal pursuits (e.g., 'I think about other new goals to pursue'). Participants were asked to think about how they would usually react when forced to stop pursuing an important goal and indicate the extent of their agreement with each statement using a 5-point scale. Goal disengagement was calculated by computing the mean of four items (items 1, 3, 6 and 8 – items 3 and 6 are reverse coded). Goal reengagement was calculated by computing the mean of the remaining six items (items 2, 4, 5, 7, 9, 10). Higher scores on the scale are indicative of an increased ability to disengage from existing goals or reengage with new goals, following a threat to goal pursuit. The Goal Adjustment Scale has been well validated in a wide range of populations (e.g., Miller & Wrosh, 2007).

4.3.4 Defeat

Defeat is conceptualised as sensitivity to environmental cues that signal defeat, and which can give rise to an overpowering feeling of needing to escape. Feelings of defeat were measured using the Defeat Scale (Gilbert & Allan, 1998; see Appendix 4). This is a 16 item self-report measure of perceived failed struggle and loss of rank (e.g. 'I feel defeated by life'). Respondents indicated on a five point Likert-type scale the extent to which each item described their feelings (0 = not at all to 4 = extremely). Items 2, 4 and 9 on the scale are reverse scored and total scores are then calculated with higher scores indicating high levels of defeat. This scale has been found to have good psychometric properties and significantly correlates with depression (Gilbert & Allan, 1998; Gilbert, Allan & Brough, 2002).

4.3.5 Entrapment

Entrapment represents the sense of being unable to escape the feeling of defeat and rejection, and is measured by the Entrapment Scale (Gilbert & Allan, 1998; see Appendix 5). This is a 16-item measure of entrapment, which includes two subscales: internal

entrapment (perception of entrapment by one's own thoughts and feelings: e.g., 'I feel powerless to change myself'; 6 items) and external entrapment (perceptions of entrapment by external situations: e.g., 'I feel trapped by other people'; 10 items). Respondents indicated on a five point Likert-type scale the extent to which each item described their feelings (0 = not at all to 4 = extremely). This scale has been found to be reliable and valid (Gilbert & Allan, 1998).

4.3.6 Rescue (Social Support)

Rescue factors were operationalized as social support, which was measured by the ENRICHD Social Support Instrument (ESSI; Vaglio, Conrad, Poston, O'Keefe, et al. 2004; see Appendix 6). This is a seven-item, self-report measure of social support. Participants were asked to rate the extent of their agreement in relation to different aspects of social support. Answers range from 0 (none of the time) to 4 (all of the time). Individual answers are then summed for a total score with higher scores indicating greater social support. This scale has been found to have good psychometric properties (Vaglio et al., 2004).

4.4 Baseline Wellbeing/Distress Measures

4.4.1 Stress

The Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983; see Appendix 7) was developed to provide a measure of stress appraisal, specifically, the extent to which an individual perceives life as outwith their control, unpredictable and demanding. The PSS is a 14-item measure of global self-appraised stress (e.g. 'Felt that things were going your way') Participants indicated how they had been feeling over a specified period of time on a five-point scale ranging from 0 (never) to 4 (very often). Higher scores indicate greater levels of perceived stress and low scores reflected low levels of stress. A shorter, 4-item, version of the PSS (Cohen et al., 1983) is also available and was used in this study to reduce the burden of questions on participants (items 2, 6, 7 and 14). Items 6 and 7 are reverse scored. Predictive validities and internal and test-retest reliabilities of the scale have been established as good (Cohen, et al., 1983).

4.4.2 Hopelessness

The Beck Hopelessness Scale (BHS; Beck, Weissman, Lester & Trexler, 1974; see Appendix 8) measures pessimism towards the future (e.g., 'It's very unlikely that I will get any real satisfaction in the future'). This 20-item scale asks participants to indicate their

agreement or disagreement with each item (true or false). Items 2,4,7,9,11,12,14,16,17,18 and 20 are scored 1 point for 'true' and 0 points for 'false', then items 1,3,5,8,10,13,15 and 19 are scored 1 point for 'false' and 0 points for 'true'. Scores of 15 to 20 indicate severe, 9 to 14 – moderate; 4 to 8 – mild and 0 to 3 - minimal levels of hopelessness. This is a reliable and valid measure that has been shown to predict eventual suicide (Beck, Steer, Kovacs et al., 1985 and Holden & Fekken, 1988).

4.4.3 Depression

The Beck Depression Inventory-II (BDI-II, Beck, Steer & Brown, 1996; see Appendix 9) was used as a self-report measure of depression. It is a 21 question self-report inventory; each item has four possible responses and each answer can be scored on a value of 0 to 3. Each of the 21 items on the scale measures how an individual has been feeling in the last two weeks. The sum of all BDI scores indicate the severity of the depression. The maximum possible score is 63. This measure is widely used, it has been found to yield internally consistent and valid scores and has good construct validity (Dozois, Dobson & Ahnberg, 1998; Schotte, Maes, Cluydts, DeDoncker, & Cosyns, 1997).

4.4.4 Suicide Ideation

Two measures of suicidal ideation were employed.

(1) Suicidal ideation was assessed using the suicidal ideation subscale of the Suicide Probability Scale (Cull & Gill, 1988; see appendix 10). The subscale is comprised of eight items pertaining to suicidal cognitions, negative affect, and presence of a suicide plan (e.g., 'I feel that people would be better off if I were dead'). Participants were asked to indicate how often they feel each statement applies to them from none or a little of the time (1) to most or all of the time (4). Maximum score is 32. The scale has acceptable reliability and validity (Cull & Gill, 1988).

(2) Suicide ideation was also assessed using the Beck Scale for Suicidal Ideation (BSSI; Beck & Steer, 1993; see Appendix 11). The BSSI is a well-established 21-item scale measuring suicidal thinking over preceding seven days. Items are scored 0 to 2 for example 'I have no desire to kill myself' (0) to 'I have a moderate to strong desire to kill myself '(2). The self-report version of the scale has good concurrent validity and internal consistency (Luxton, Rudd, Reger & Gahm, 2011).

4.4.5 Self-harm

Self-harm was recorded if a respondent answered yes to the following question 'have you ever deliberately taken an overdose (e.g., pills or other medication) or tried to harm yourself in some other way (such as cut yourself)?' If participants answered yes to this item they were then asked when they last self-harmed.

Participants were also asked four questions to determine whether they have ever engaged in/or seriously thought about self-harm.

1. 'Have you ever seriously thought of taking your life, but not actually attempted to do so?'
2. 'Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?'
3. 'Have you ever seriously thought about trying to deliberately harm yourself but not with the intention of killing yourself and not actually done so?'
4. 'Have you ever deliberately harmed yourself in any way but not with the intention of killing yourself?'

These questions are taken from the Child and Adolescent Self-Harm in Europe Study (Madge, Hewitt, Hawton et al, 2008) and the British Psychiatric Morbidity Study (McManus, Meltzer, Brugha, Bebbington & Jenkins, 2009). They have been widely used in a range of other studies (e.g., O'Connor, Rasmussen, & Hawton, 2012).

4.5 Means End Problem-solving task-Revised (MEPS-R)

4.5.1 MEPS-R

The measure employed was a revised measure of Platt and Spivack's (1975) original ten scenarios. Details describing the procedure for developing the scenarios are explained in Chapter 6. The ten revised scenarios that comprise the MEPS-R are listed below:

1. You and your partner have recently been having a lot of arguments and you want to do something to make things better between you both.
The story ends with you arguing less.

2. You come home after being out and realise that you have lost your wallet/purse or mobile.
The story ends with you finding your wallet/purse or mobile.

3. You have just moved and want to meet new people in the area.

The story ends with you meeting new people in the area.

4. You notice that a friend seems to be avoiding you and you want things to be how they were previously.

The story ends with all being well between you and your friend again.

5. You are having problems getting along with a colleague at work

The story ends with you and your colleague getting along better.

6. Money is going to be tight this month as you have received an unexpected bill.

The story ends with you being able to pay all your bills.

7. You and a friend have been messaging or texting and you are upset by something that they have written.

The story ends with you no longer being upset.

8. You are worried about the health of a close friend or relative and you are not sure what to do.

The story ends with you being less worried about your close friend/relative's health.

9. Recently, a friend has been repeatedly letting you down.

The story ends with you no longer feeling let down.

10. You have been really worried about what a friend thinks about you.

The story ends with you feeling less worried about what your friend thinks about you.

4.5.2 Procedure for use of MEPS-R

The MEPS-R was administered using two different methods. First, during the face-to-face study (Chapter 7) and the experimental study (Chapter 8) the scenarios were read out to the participants by the experimenter. Second, in the on-line study (Chapter 7), where a remote access website was employed (i.e. there was no contact between the experimenter and the participant for the delivery of the MEPS-R), participants read instructions and completed the MEPS-R on-line.

In the face-to-face and the experimental studies participants were briefed that ten scenarios
would be read aloud to them; in addition they were told that they would be shown a card
with the scenario written on it. Participants were advised that each scenario included a
problem to be solved and that they would also be provided with the ending to the problem.
Participants were then informed that they were required to describe the best way to solve
the problem, in other words they must connect the beginning and the end to each of the
scenarios, providing the 'ideal strategy' to solving the problem (Marx, Williams &
Claridge,1992).

The ten scenarios were randomised using a web-based randomiser programme to allocate
the order of the scenarios for each participant in both the face-to-face study and the online
study testing the MEPS-R. In the experimental study the scenarios were divided into set A
(comprising of scenarios 1,3,5,7 and 9) and set B (scenarios 2,4,6,8 and 10), participants
were randomly allocated to either set A or set B.

In both the face-to-face and experimental studies participants relayed their responses
verbally to the experimenter who in turn wrote their responses down on proforma sheets.
The responses were then transferred onto a excel document ready for scoring. The
procedure was different for the online study, where the external website recorded the
responses to the scenarios, which were typed in by the participants. The software
programme then converted all of the responses for all of the participants onto a PDF sheet,
which was then used to score the responses.

4.5.3 Scoring

The same method was employed for scoring the responses for all three MEPS studies. For
each MEPS-R scenario, two dependent variables were derived, overall effectiveness and
relevant mean steps for each scenario (Williams, Barnhofer, Crane and Beck, 2005). The
overall effectiveness of the participant's responses for each scenario was rated on a 7-point
Likert-type scale (1 = not at all effective to 7 = extremely effective); the scores were then
totaled for each participant on all ten scenarios. Relevant means (active problem-solving
steps) were scored using category sheets (see Appendix 12 for a full description). The total
number of categories (mean steps) was totaled for each participant per scenario, then the
scores for each participant's ten scenarios were totaled which gave each participant a total
relevant means score across all ten scenarios. Scoring in the experimental study involved
summing the scores for effectiveness and relevant means before and after the mood

induction following the same procedure. Thus, there was a total score for group A and B scenarios.

Scoring was conducted by two independent raters (see Chapter 7 for more details on coding framework), consistency between raters was established on a random sample of 50% of the cases. Each of the ratings is reported in the chapter for each study.

4.6 Visual Analogue Scale (VAS) mood rating

During the experimental study (Chapter 8) participants were asked to rate their mood on three 100mm Visual Analogue scales (VAS; Appendix 13) at five different points throughout the study. For each rating the statement 'at this moment I feel….' was printed above the line and either 'defeat', 'happy' or 'sad' were printed below the line, anchored on a scale of 'not at all' to 'extremely' (consistent with Johnston, Tarrier & Gooding, 2008). The five occasions were, once before the first set of MEPS-R scenarios (set A or B), then after the first set of scenarios, once before the mood induction and then again after the negative mood induction and then at the end of the study after the positive mood induction (see each experimental chapter for full procedural details).

4.7 Manipulation Procedure

In Chapter 8 participants were randomised into either an experimental (defeat) condition, or a control (no defeat) condition using a web-based randomiser programme to allocate participants into each condition. Defeat/no defeat was induced following procedures adapted from Pegg, Deakin, Anderson and Elliott (2006) by Johnson et al. (2008). Both manipulations were comprised of two 30 trial computerised tasks (anagrams) which run on e-prime software. There were two versions of the task, one impossible and one achievable version. Participants in the defeat (experimental) condition receive the impossible version of the tasks and those in the no defeat (control) condition receive the achievable version.

In the anagram task, participants were required to form new words using all the letters in the target word (e.g. room could be created from moor). There were two versions of the task, one impossible and one achievable version. Each task contained 30 trials, and in the impossible version, seven of these were unsolvable. The pass rate was set at 23 and participants were encouraged to score above this. The achievable version contains 23 of the trials from the impossible version, but in place of the impossible trials it includes seven

trials that were highly achievable, and the pass rate was set at 15. Johnson et al. (2008) and O'Connor and Williams (2014) have found that this manipulation successfully induces defeat.

4.7.1 Positive mood induction

This was a series of clips that was edited into a ten-minute video to show participants. It had been developed by colleagues at Harvard University for another mood induction study. Clips in the video included animals, children and adults all involved in some event that can be construed as 'funny'. The aim of the induction was to induce positive feelings in participants following the defeat induction.

4.8 Overview of Thesis

Figure 3.1 outlines how the studies that constitute the main body of this thesis inter-relate. This thesis begins with a systematic review of the literature which had two primary aims; firstly, to investigate the relationship between social problem-solving and suicidality in adults and secondly, to review the measures of social problem-solving employed in suicide research. As a result of this review the SPSI-R-SF was found to be the most suitable process measure of social problem-solving for this thesis. In addition, the review highlighted the need to revise the original MEPS scenarios thereby laying the foundation for the development of the MEPS-R.

The thesis then divides into two different sections; firstly, a prospective study investigating social problem-solving within the IMV framework and then secondly the revision of the MEPS (Platt & Spivack, 1975) into the MEPS-R. A prospective study design (Chapter 5) was employed to investigate social problem-solving within the context of the IMV model, crucially, by employing the widely used SPSI-R-SF. In addition, the original MEPS scenarios were revised and updated (Chapter 6) leading to the development of the revised MEPS (MEPS-R) which is comprised of ten revised and updated scenarios. These scenarios were subsequently tested using two methods (Chapter 7). The MEPS-R was tested using face-to-face interviews and on-line self-completion. In addition, to enable further analysis of the new measure, other well established correlates of psychological distress were also included. Importantly, the new scenarios were tested on-line using a remote access website. The final study in this thesis (Chapter 8) was experimental in design, it followed on from the prospective study where it employed the SPS-R-SF and explored the role of social problem-solving and defeat in more depth. This final study also employed the new MEPS-R.

In short, this thesis resulted in the revision of the original MEPS scenarios into the MEPS-R. It involved the initial testing of the revised scenarios by employing two different methods which were on-line, (testing the measure using a remote access website) and experimental in nature (the administration of the MEPS-R and the SPSI-R-SF in a face to face setting). It also investigated how social problem-solving is related to established suicide risk factors within a new theoretical framework.

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                    │     Chapter 3       │
                    │  Systematic Review  │
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                         │     │    Chapter 6     │
                         │     │ Revising the MEPS│
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              │     Chapter 5      │  │    Chapter 7     │
              │ Prospective Study  │  │  Testing MEPS-R  │
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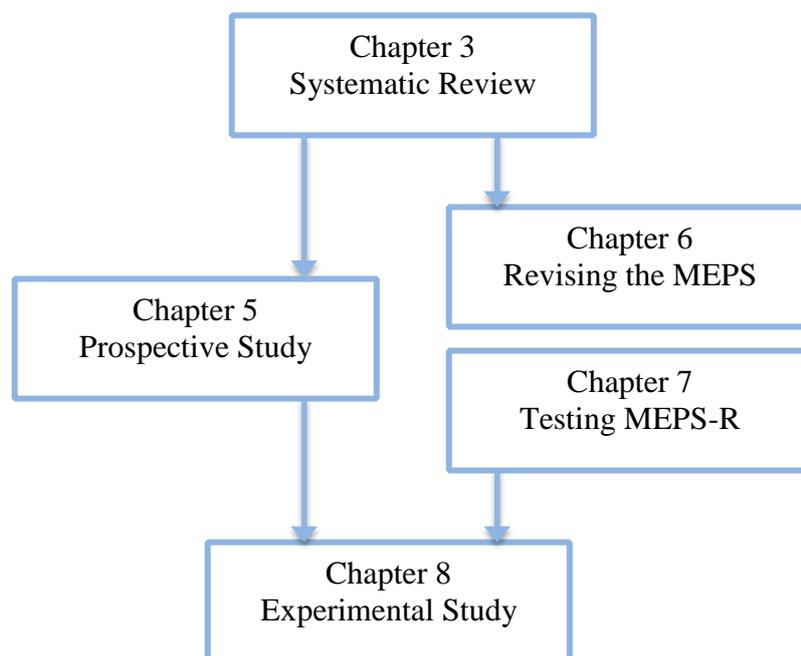
Figure 4.1 Overview of main body of this thesis

Chapter Five: A prospective study to examine the relationship between social-problem-solving and suicide risk factors within the IMV model

5.1 Abstract

Aims

The aims of this study were two-fold, firstly, to test social problem-solving as a motivational moderator within the Integrated Motivational model of suicidal behaviour (IMV). Secondly, to further investigate the relationship between social problem-solving, rumination, goal adjustment, psychological distress and suicidal behaviour.

Method

At time one, 322 university students completed self-report measures of social problem-solving, rumination, goal adjustment, stress, hopelessness, depression, suicide ideation and self-harm on-line. At time two, 2–4 months later, 220 participants re-completed self-reports measures of stress, hopelessness and suicide ideation.

Results

A series of t-tests, MANOVAs and multiple hierarchical regression analyses were used to investigate the moderating and mediating effects of social problem-solving within the IMV model. Negative Problem Orientation (NPO) was found to differentiate individuals who reported self-harm from those with no history of self-harm. The dysfunctional social problem-solving subscales were associated with psychological distress and NPO and Avoidance Style (AS) were found to mediate the defeat-entrapment relationship. Rational Problem-Solving (RPS) and goal reengagement were found to be moderators within the IMV model and brooding rumination was found to be a mediator in the defeat-entrapment relationship.

Conclusions

NPO was found to be the most pernicious subscale of the social problem-solving inventory. Support was found for social problem-solving as a risk factor within the IMV model.

5.2 Introduction and Overview

Social problem-solving has been the subject of considerable attention in relation to suicidal behaviour for some time now (some of the earliest studies date back to the 1960s; Neuringer, 1967, see Chapter 1). Studies consistently show that it is a key risk factor for suicidal behaviour. Indeed, two comprehensive reviews of the literature have highlighted the importance of this proximal risk factor within the suicidal process (Pollock & Williams, 1998; Speckens & Hawton, 2005). Indeed Pollock and Williams (1998) stated that social problem-solving is an 'important variable' in the aetiology of suicidal behaviour and in a systematic review of adolescent research, Speckens and Hawton (2005) found evidence of deficits in social problem-solving among suicide attempters. Moreover, the later review concluded that the association between social problem-solving and suicidal behaviour was strongest in clinical populations.

However, as noted in Chapter 3, a frequent problem with research in this area is the diversity of measures employed across studies which has limited our ability to combine findings across studies. Therefore, to address this issue, in this chapter we have focused on the most widely used self-report questionnaire measure, the Social Problem-solving Inventory-Revised (SPSI-R; D'Zurilla, Nezu & Maydeu-Olivares, 2002), to investigate the relationship between social problem-solving and correlates of suicide risk in more depth. As previously detailed in Chapter 2, theoretical models are key to guide understanding of the psychological processes involved in this thesis; we are employing the Integrated Motivational Volitional Model of suicidal behaviour (IMV; O'Connor, 2011) to this end. By using the IMV model as a theoretical framework and the SPSI-R as a measure of social problem-solving, in this chapter we investigated the nature of the relationship between problem-solving, defeat, entrapment, rumination, goal adjustment and suicidal ideation/behaviour.

5.2.1 Measuring social problem-solving

To enable a closer examination of the relationship between social problem-solving and other proximal risk factors, consideration must be given to selecting the best measure with which to conduct this investigation. In a previous chapter (Chapter 3) the Social problem-solving inventory (SPSI-R) and the Problem Solving Inventory (PSI) were identified as the most commonly used process measures of social problem-solving. Indeed, Pollock and Williams (1998) highlighted the PSI as the most commonly used measure in their review

but also stated that the SPSI-R was 'gaining in popularity'. Further to this, in their systematic review, Speckens and Hawton (2005) reported that the SPSI-R was the most extensively used measure in an adolescent population and that the PSI only measured an individual's self-appraisal of their problem-solving ability whereas the SPSI-R measured orientation and skills. D'Zurilla and Maydeu-Olivares (1995) reviewed most of the measures of social problem-solving and concluded that they all have short-comings but that of all the process measures (see more details in Chapter 1 and 3) the SPSI appears to have the strongest support in test design and implementation. Finally Sadowski, Moore and Kelley (1994) suggest that the subscales of the SPSI-R may be useful in investigating the differences between different clinical groups.

As noted in Sadowski et al. (1994), a key strength of the SPSI-R is that it is comprised of five subscales, two of which tap problem-solving orientation and three of which record problem-solving style. The extra sensitivity provided by the subscales has been useful in identifying specific types of social problem-solving which may be more pertinent to assessing suicide risk (Reinecke, Dubois & Schultz, 2001; D'Zurilla & Maydeu-Olivares, 1995, see also Chapter 3). For example, D'Zurilla and Maydeau-Olivares (1995) found that NPO and AS were significantly related to suicide risk. Despite these welcome advances, key questions still remain unanswered. For example, what is the relationship between the subscales and other established risk factors for suicidal behaviour?

5.2.2 Social problem-solving and psychological distress
D'Zurilla et al. (1998) specifically employed the SPSI-R in two separate studies with different populations (college population and a general population) with the aim to investigate the relationship between hopelessness, depression and suicide risk. They found that positive problem orientation (PPO) was significantly negatively associated with hopelessness, depression and suicide ideation whilst negative problem orientation (NPO) was significantly positively associated with the same variables. In a third study with a suicidal clinical population they found that rational problem-solving (RPS) was an important predictor variable for suicide risk (D'Zurilla et al., 1998). This study focused on suicide ideation, therefore these results may not generalise to a self-harm population.

Although the evidence provided in this thesis thus far (Chapter 3) has shown that there is an inverse relationship between effective social problem-solving ability and suicidality and that depression is a major factor that underpins social problem-solving (Speckens and

Hawton, 2005) what is less clear is the nature of the relationship, beyond the empirical fact that depressed individuals possess poorer problem-solving ability than those who are not depressed (Marx, Williams & Claridge, 1992).

A further issue that requires attention is whether social problem-solving is a moderator or a mediator in the stress-suicide risk relationship. Indeed, Chang (2002) tried to address this by examining the role of social problem-solving as a moderator and mediator of the relationship between life stress and suicide ideation in a college sample. He found that social problem-solving partially mediated the influence of life stress on suicide ideation independent of suicide history, and that life stress was the stronger predictor than social problem-solving. The study also found no evidence for social problem-solving moderating the life-stress-suicide ideation relationship. Although this study was promising, as it used the total SPSI-R score only, therefore it is vital that one examines the relationship between the specific dimensions of the social problem-solving and suicidality.

In another more recent study, Gibbs, Dombrovski, Morse, Siegle, Houck and Szanto (2009) administered the SPSI-R to older clinical participants within a case control design. They found that both those who had attempted suicide or who were depressed scored lower on the PPO subscale than a group of non-depressed individuals. Furthermore, scores on the NPO and ICS subscales were also significantly higher in the suicide attempter group than the depressed and non-depressed groups. So, although these studies show that dysfunctional problem-solving is associated with psychological distress, among those who have thoughts of suicide, less is known about the relationship between different problem-solving styles and actual self-harm. Therefore, we aim to investigate whether those with and without a history of self-harm exhibit different patterns of social problem-solving.

One recent study has endeavoured to address this dearth in research. Turner, Chapman and Layden (2012) recruited individuals who report self-harm from non-suicidal self-injury (NSSI) websites. They examined how functions of NSSI are associated with specific affective traits, emotion regulation and social problem-solving. Turner et al. (2012) found that NPO, ICS and AS were significantly positively related to emotion regulation strategies of individuals who engage in NSSI. Emotion regulation strategies are posited to be functions that reflect the individual's attempts to escape or down-regulate intense negative emotions. In other words, this suggests that high dysfunctional problem-solving is associated with strategies to escape negative emotions consistent with the IMV model.

Chesin and Jeglic (2012) have also examined self-harm in a cross-sectional study of college students. They found a negative association between PPO and suicidal behaviour and that PPO statistically predicted suicidal behaviour. This seems to highlight that deficits in a positive orientation to problems, or seeing problems more as a threat than a challenge, is also an important factor in the social problem-solving- suicidality relationship. Taken together, these recent studies highlight the utility of attempting to identify specific types of social problem-solving which are more strongly associated with suicidality including actual self-harm.

5.2.3 The Integrated Motivational Model of suicidal behaviour and social problem-solving

The IMV model of suicidal behaviour (O'Connor, 2011; see Chapter 2 for further details) is a tripartite model that attempts to explain suicide and self-harm. The motivational phase of the model is the ideation/intention formation phase, of which the key variables are defeat and entrapment. Within this phase of the model social problem-solving is posited to be a threat to self moderator (TSM) which is a factor that facilitates or obstructs movement between defeat and entrapment. According to the model, poor or dysfunctional social problem-solving increases the risk that an individual will move from perceptions of defeat to feeling trapped and that there is no way of escaping the current situation. As yet no study has tested social problem-solving within the IMV model. According to the model it is hypothesised that dysfunctional social problem-solving can potentially increase the likelihood of perceptions of entrapment by acting as a TSM.

5.2.3.1 Rumination and social problem-solving

Although rumination is a well established correlate of depression, it is only in the past 20 years or so that its relationship with social problem-solving has been recognised with Lyumbomirsky & Nolen-Hoeksema (1995) finding that as individuals become more and more focused on thinking about the cause of their distress (i.e. they ruminate) they become less focused on trying to solve a problem which is counterproductive.

In a case-control study Watkins and Baracaia (2002) also investigated the relationship between rumination and problem-solving in a different way. They found that the 'cognitive style' of an individual influenced the outcome of problem-solving using the MEPS. Specifically, they compared a group of participants who had recovered from depression and a group who were currently depressed and found that both groups exhibited poor problem-solving ability when their 'cognitive style' (rumination) was activated. This

led the authors to conclude that social problem-solving is a consequence of state-orientated rumination and that rumination leads to poorer social problem-solving.

Also employing the MEPS, Donaldson and Lam (2004) found that depressed individuals provided less effective problem-solving solutions and exhibited higher levels of rumination than a control group who were not depressed. Indeed, when these authors induced rumination they found that there was a deterioration in problem-solving in the depressed group but not in the control group. This suggests that the effects of rumination are most marked in individuals with a depressive history. Watkins and Mould (2005) also conducted an experimental study investigating ruminative styles in depressed and never depressed patients. Participants were randomised into either abstract or concrete thinking groups and asked to complete the MEPS. They found that social problem-solving was poorer after individuals had engaged in abstract ruminative focus. These experimental studies add to the naturalistic literature as they demonstrate that rumination has both state and trait components and both are associated with social problem-solving ability.

As noted above, although rumination is a widely used construct within the psychopathology literature, about a decade ago, Treynor, Gonzalez and Nolen-Hoeksema (2003) argued that rumination is comprised of two components: brooding and reflection. Brooding refers to ruminative thoughts in which one compares their current situation with an unachieved benchmark, whilst reflection (or reflective pondering) refers to self-focus aimed at problem-solving in response to depressed mood. As a consequence, most recent studies have operationalized rumination in terms of brooding and reflection.

A good example of a study which has investigated the differential relationship between brooding and reflection and suicidality is that conducted by Crane and colleagues (2007). Although numerous studies have demonstrated that brooding is associated with suicidal ideation (e.g. O'Connor & Noyce, 2008), they found that it may not be the high levels of brooding but rather the depletion of reflection that is most associated with increased suicide risk. However, as the Crane et al. study was small scale, it is important to explore the relationship between the different dimensions of rumination and suicidality in larger scale studies.

In addition, although these recent studies show that there is a relationship between rumination and social problem-solving, as all of these studies employed the MEPS (which

show that rumination is related to poorer problem-solving performance) the relationship between problem-solving orientation/skills and rumination is currently unknown.

5.2.3.2 Goal adjustment and social problem-solving

Although goal adjustment (goal reengagement and disengagement) and social problem-solving are key proximal risk factors within the IMV model, to the knowledge of the author, no research to date has explored the relationship between social problem-solving and goal regulation. However, it is clear from previous research that goal reengagement is a strong predictor of suicidal behaviour (O'Connor et al., 2012), therefore, although it is not clear how it is related to social problem-solving, according to the IMV model, it is likely that goal reengagement is strongly associated with defeat and entrapment.

In summary, the present study extends previous research by investigating in detail the nature of the relationship between social problem-solving, rumination, goal adjustment and suicidality explicitly within the IMV model of suicidal behaviour.

5.2.4 Study Aims

The current study had two aims, first to work explicitly within the IMV model to test how social problem-solving fits within the model. Second, to further investigate the relationship between social problem-solving, rumination, goal adjustment and suicidality.

5.2.5 Research questions and hypothesis

Based on the review of previous research, the following research questions and hypotheses were formulated.

1. Do individuals who report self-harm differ in social problem-solving orientation and defeat and entrapment compared to those without a history of self-harm?

Given that the SPSI-R has five sub-scales, two of which are posited to be adaptive (positive) and three are thought to be dysfunctional and based on previous research findings we hypothesised that:

Hypothesis 1. Individuals who report self-harm would have higher levels of NPO, ICS and AS and lower levels of PPO and RPS than those who do not. Consistent with the IMV model, we hypothesised that those who report self-harm would exhibit higher levels of

defeat and entrapment and lower levels of social support than those who do not report self-harm (hypothesis 2).

2. What is the nature of the relationship between the subscales of the SPSI-R and psychological distress, rumination and goal adjustment?

We hypothesised that NPO, ICS and AS would be positively associated with stress, hopelessness, depression, defeat, entrapment and suicide ideation whilst PPO and RPS would be negatively associated with these variables (hypothesis 3).

It was further hypothesised that brooding rumination would be positively associated with NPO, ICS and AS and negatively associated with PPO and RPS (hypothesis 4). It was hypothesised that goal disengagement would be positively associated with PPO and RPS and negatively associated with NPO, ICS and AS (hypothesis 5). Finally, it was hypothesised that goal reengagement would be negatively associated with NPO, ICS and AS and positively associated with PPO and RPS (hypothesis 6).

3. Do all the sub-scales on the SPSI-R predict hopelessness and suicide ideation whilst controlling for depression?

Following previous research (e.g., Reneicke et al, 2001) we hypothesised that NPO, ICS and AS would be the strongest social problem-solving predictors of hopelessness and suicide ideation whilst controlling for depression (hypothesis 7). To minimise the likelihood that any emergent relationships are accounted for by the concurrent low mood, depression is controlled for in all analyses.

4. Consistent with the IMV model, does rumination moderate the defeat-entrapment relationship?

Following the IMV model it was hypothesised that rumination, specifically brooding, would moderate the defeat-entrapment relationship (hypothesis 8).

5. Following the IMV model, to what extent do the dimensions of social problem-solving (as assessed via the SPSI-R) moderate the defeat-entrapment relationship?

Based on the IMV model, we predicted that NPO, ICS and AS would moderate the defeat-entrapment relationship (hypothesis 9).

6. Following the IMV model does goal reengagement moderate the entrapment-suicidal ideation relationship at T1?

Based on previous research (e.g. O'Connor et al., 2012) and the IMV model it was predicted that goal reengagement would moderate the entrapment-suicide ideation relationship (hypothesis 10).

7. To what extent do the dimensions of social problem-solving (as assessed via the SPSI-R) mediate the defeat entrapment relationship?

We predicted that NPO, ICS and AS would mediate the defeat-entrapment relationship (hypothesis 11).

8. Does rumination mediate the defeat-entrapment relationship?

It was hypothesised that rumination, specifically brooding, would mediate the defeat-entrapment relationship (hypothesis 12).

5.3 Method

5.3.1 Participants

Recruitment included two main methods. Students were recruited via the university's on-line experimental management system and participants received one course credit for their participation. Snowballing techniques were employed to yield a sample from the general population. The study was conducted via an independent on-line web-site. Ethical approval was granted from the University ethics committee.

At Time 1 (T1) 322 healthy adults were recruited from university undergraduate population (n=259) and general population (n=63) samples, with a total mean age of 24.8 years (SD=10.07), range from 17 years to 70 years. There were 261 females (81%), mean age of 23.79 years (SD= 9.13) and 61 males (18.9%) with a mean age of 27 to 53 years (SD= 13.13). Males were found to be significantly older than females, and this was found to be significant t (72.63) = 2.09, p = .04.

At T1 student participants included 48 males (mean age: 22.54, SD=7.87) and 211 females (mean age: 20.95 years, SD=6.35) yielding a total of 259 participants (80.4%) with an overall mean age of 21.24 years (SD= 6.67). A total of 63 participants (19.6%) were recruited from the general population with an overall mean age of 37.78 years (SD= 10.79) and a range of 22 years to 70 years, this included 12 males (mean age: 47.50 years, SD

=10.8) and 51 females (mean age: 35.49 years, SD= 6.35). There was a significant difference in age between those participants recruited from student and general population samples t (73.91) = -11.64, p = <.001).

A total of 220 participants completed Time 2 (T2) measures (two to four months later, with a median follow-up of 10weeks), thereby yielding a 68% follow-up rate with a mean age of 23.31 years (SD=8.92) and an age range of 17 to 63 years. There were 39 males (17.7%) with a mean age of 28.32 years (SD=13.52) and 181 (82.3%) females with a mean age of 22.23 years (SD=7.19). The mean age for males was found to be higher in males than females and this difference was found to be significant t (42.74)= 2.72, p = .009.

T2 yielded 186 (84.5%) participants from a student population and 34 (15.5%) from the general public. The mean age of the student participants was 20.69 years (SD=5.61) and the range was 17 to 63. There were 155 females with a mean age of 20.17 years (SD=4.44) that ranged from 17 years to 49 years and 31 male students with a mean age of 23.26 years (SD=9.22) that ranged from 17 years to 63 years. At T2 there were 34 general population participants with a mean age of 37.65 years (SD=10.07) that ranged from 22 years to 58 years. From those participants recruited form the general population there were 26 females with a mean age of 34.5 years (SD=8.27) that ranged from 22 years to 48 years and 8 males with a mean age of 47.87 years (SD=8.77) that ranged from 32 years to 58 years. The student mean age was found to be 20.69 years which was significantly lower than the general population mean age (37.65 years) t (36.83) = -.956, p < .001.

5.3.2 Measures

5.3.2.1 Baseline measures

Full details of the measures can be found in Chapter 4.

Hopelessness

The Beck Hopelessness Scale (BHS; Beck, Weissman, Lester & Trexler, 1974) measures pessimism towards the future (e.g., 'It's very unlikely that I will get any real satisfaction in the future'). This 20-item scale asks participants to indicate their agreement or disagreement with each item. Higher scores indicate greater levels of hopelessness. Cronbach's α was .90 at T1 and .93 at T2.

Depression

The Beck Depression Inventory (BDI; BDI-II, 1996) was used to measure depression. It is a 21 question self-report inventory; each with four possible responses and each answer can be scored on a value of 0 to 3. The sum of all BDI scores indicate the severity of the depression. The maximum score is 63. Cronbach's alpha for T1 was .94 and for T2 it was also .94.

Suicide Ideation

Suicidal ideation was assessed using the suicidal ideation subscale of the Suicide Probability Scale (Cull & Gill, 1988). The subscale is comprised of eight items pertaining to suicidal cognitions, negative affect, and presence of a suicide plan (e.g., 'I feel that people would be better off if I were dead'). Participants were asked to indicate how often they feel the statement applies to them from none or a little of the time (1) to most or all of the time (4). Maximum score is 32. The scale has shown reliability and validity (Cull & Gill, 1988). Cronbach's alpha at T1 was .85 and at T2 it was .80.

Self-harm

Self-harm was recorded if a respondent answered yes to the following question "have you ever deliberately taken an overdose (e.g., pills or other medication) or tried to harm yourself in some other way (such as cut yourself)?' If participants reported self-harm they were then asked when they had last self-harmed.

5.3.2.2 Predictor measures

Defeat

Defeat is conceptualised as sensitivity to environmental cues that signal defeat, and which give rise to an overpowering feeling of needing to escape. Feelings of defeat were measured using the Defeat Scale (Gilbert & Allan, 1998). This is a 16 item self-report measure of perceived failed struggle and loss of rank (e.g. 'I feel defeated by life'). Respondents indicated on a five point Likert-type scale the extent to which each item described their feelings (0 = not at all to 4 = extremely). This scale has been found to have good psychometric properties (Gilbert & Allan, 1998; Gilbert et al., 2002). Internal consistency in the present sample was very good (Cronbach's α = .94) at T1.

Entrapment

Entrapment represents the sense of being unable to escape the feeling of defeat and rejection, and is measured by the Entrapment Scale (Gilbert & Allan, 1998). This is a 16-

item measure of entrapment, which includes two subscales: internal entrapment (defined as perception of entrapment by one's own thoughts and feelings: e.g., 'I feel powerless to change myself'; 6 items) and external entrapment (defined as perceptions of entrapment by external situations: e.g., 'I feel trapped by other people'; 10 items). Cronbach's α = .96 at T1.

Social Support

Perceived social support was measured by the ENRICHD Social Support Instrument (ESSI; Vaglio et al, 2004). This is a seven-item, self-report measure of social support. Participants were asked to rate the extent of their agreement in relation to different aspects of social support. Answers range from 0 (none of the time) to 4 (all of the time). Individual answers are then summed for a total score with higher scores indicating greater social support. This scale has been found to have good psychometric properties (Vaglio et al, 2004). Cronbach α was .89 at T1.

Stress

The Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983) was developed to provide a measure of stress appraisal, specifically, the extent to which an individual perceives life as out with their control, unpredictable and demanding. The PSS is a 14-item measure of global self-appraised stress (e.g. 'Felt that things were going your way'). Participants indicated how they had been feeling over a four week period of time on a five-point scale ranging from 0 (never) to 4 (very often). Higher scores indicate greater levels of perceived stress. Test-retest validity of the PSS over a six week period has been reported as r = .55 (Cohen et al., 1983). A shorter, 4-item, version of the PSS (Cohen et al., 1983) is also available and was used in this study to reduce the burden of questions on participants (items 2, 6, 7 and 14). Internal consistency (Cronbach's α) of the PSS-Short was .80 at T1 and .88 at T2.

Social Problem Solving

Social problem-solving was assessed via the Social Problem-Solving Inventory – Revised: Short Form (SPSI-R: S; D'Zurilla, Nezu & Maydeu-Olivares, 2002). The SPSI-R: S is a 25- item self-report questionnaire with five sub-scales: Positive Problem Orientation (PPO), Negative Problem Orientation (NPO), Rational Problem Solving (RPS), Impulsivity/Carelessness Style (ICS) and Avoidance Style (AS). Examples of items include 'I feel threatened and afraid when I have an important problem to solve' and

'When my first efforts fail, I get very frustrated'. Participants rate the extent to which each statement is true on a five-point Likert scale.

Higher scores on negative problem orientation indicate a greater tendency to view a problem as a significant threat to well-being, pessimism, negative outcome expectancies and low self-efficacy (Bandura, 1997) and low frustration tolerance. Higher scores on a positive problem orientation indicate a greater tendency to appraise a problem as a challenge rather than a threat, to be more optimistic, and exhibit higher levels of positive outcome expectancies and self-efficacy (Bandura, 1997), and the belief that successful problem-solving takes times, effort and persistence. A high score on rational problem-solving indicates that the person carefully and systematically gathers information and facts, identifies a variety of different alternative solutions (generation of alternative solutions), evaluates possible consequences, judges and compares the alternatives, chooses (decision-making) and then implements a solution while carefully monitoring and evaluating the outcomes (solution implementation and verification). A high score on impulsivity/carelessness style indicates that a person scans only a few solution alternatives, consequences and solution outcomes quickly, carelessly and unsystematically. A high score on avoidance style indicates that a person prefers to avoid problems rather than to confront them and attempts to shift the responsibility for solving his or her problem to others. Higher scores on positive problem orientation and rational–problem-solving and lower scores in the remaining scales are considered to reflect functional, constructive, adaptive and affect problem-solving (D'Zurilla et al., 2002).

Scores were calculated by summing each of the scores in the five sub-scales and internal reliability was as follows: PPO: Cronbach's $\alpha = .78$; NPO: Cronbach's $\alpha = .84$; RPS: Cronbach's $\alpha = .73$; ICS: Cronbach's $\alpha = .70$ and AS: Cronbach's $\alpha = .78$.

Rumination

The Rumination Response Scale (RRS) of the Response Style Questionnaire (RSQ) (Nolen-Hoeksema & Morrow, 1991) consists of 22 items, which record the extent to which individuals repeatedly focus on the causes, meanings, and consequences of their negative mood. The RRS is also available as a 10-item measure which was employed in this study to measure rumination. As noted above, a recent factor analysis (Treynor et al., 2003) has identified two separate sub-scales. The first, brooding, consists of five items that assess the extent to which individuals passively focus on the reasons for their distress (e.g., ' how

often do you think about a recent situation, wishing it had gone better?'). Reflective pondering or reflection, the second scale, which also consists of five items assesses the degree to which individuals engage in cognitive problem-solving to relieve their distress (e.g., 'How often do you analyse recent events to try to understand why you are depressed'). Respondents are asked to indicate how often they think about or do each item from almost never (1) to almost always (4). Cronbach's α for this study was .88 for the total scale, .84 for brooding rumination and .80 for reflective rumination.

Goal adjustment

The Goal Adjustment Scale (GAS: Wrosch, Scheier, Miller et al., 2003) is a 10 item instrument that consist of two subscales: (i) goal disengagement (four items) and, (ii) goal reengagement (six items). Goal disengagement measures one's perceived difficulty in reducing effort and relinquishing commitment toward unobtainable goals (e.g., 'it's easy for me to reduce my effort toward the goal'). The reengagement subscale taps one's perceived ability to reengage in other new goals if they face constraints on goal pursuits (e.g., 'I think about other new goals to pursue'). Participants were asked to think about how they would usually react when forced to stop pursuing an important goal and to indicate the extent of their agreement with each statement using a 5-point scale. Goal disengagement was calculated by computing the mean of four items (items 1, 3, 6 and 8 – items 3 and 6 are reverse coded). Goal reengagement was calculated by computing the mean of the remaining six items (items 2, 4, 5, 7, 9, 10). Higher scores on the scale are indicative of an increased ability to disengage from existing goals or reengage with new goals, following a threat to goal pursuit. Cronbach's alphas were recorded as α = .75 for goal disengagement and .87 for goal reengagement.

Time 2 Measures

At T2 approximately two to four months later participants were emailed and asked to complete the following outcome measures; stress, depression, hopelessness, suicidal ideation and self harm.

5.3.3 Procedure

All potential participants were given a brief introduction to what the study would require and invited to participate. To ensure anonymity but to allow participants' but to allow responses at T1 and T2 to be linked, participants were asked to answer four short questions, which would help identify them anonymously and confidentially. These

questions consisted of the following: age, gender, date of birth, first two letters of mother's first name, first two letters of home town and last two letters of post-code. At the end of the questionnaire participants were provided with information and contact details for relevant support agencies if they felt they required some support due to the issues raised in the questionnaire (see Appendix 14). Ethical approval had been obtained from the university's Psychology Department's ethics committee before commencement of the study.

5.3.4 Statistical analysis

Descriptive statistics were conducted to establish the details of the study sample and this included frequency of self-harm. The relationship between all of the study variables was investigated via Pearson's correlations analyses. MANOVAs were carried out to identify differences between relevant groups (i.e., self-harm). Regression analyses were carried out to test which variables predicted hopelessness and suicide ideation. As it is well established that depression is associated with suicidal ideation, in all analyses depression was controlled for in the first model. Initially all analyses were conducted for total entrapment, external entrapment and internal entrapment, in the interests of brevity, however, the total entrapment and external entrapment scores are not reported here. Finally, mediation and moderation analysis were carried out consistent with Baron and Kenny (1986) and Aitken and West (1991) to determine the effects of possible mediators and moderators within the IMV model. According to Kenny et al. (1998), mediation (i.e., the mediator carries the influence of the IV to the DV) is demonstrated when the following conditions are met: (1) the IV affects the mediator; (2) the IV affects the DV; (3) the mediator affects the DV when the IV is controlled for; and (4) full mediation is confirmed when the association between the IV and the DV is reduced to non-significant after the effect of the mediator is controlled for. If conditions one to three are met then partial mediation is indicated. A Sobel test is then run to test the significance of the indirect effect (Preacher & Hayes, 2004). The data was analysed using SPSS version 19 for windows.

5.4 Results

Before the analyses specific to the 12 hypotheses are presented, the frequency of self-harm within the sample is reported.

5.4.1 Frequency of Self-harm in the sample

Among the 322 participants who completed measures at T1, 71 (22%) reported having self-harmed at some stage in the past. At T2, 11 (3.4%) reported having self-harmed since they completed the first part of the study. At T1, 119 (46%) of the participants reported having had thoughts about self-harming at some time in the past and at T2, 23 (7.1%) reported having had thoughts of self-harm since they had last took part in the study.

5.4.2 Differences between groups

Hypothesis 1: Individuals who report self-harm would have higher levels of NPO, ICS and AS and lower levels of PPO and RPS than those who do not

Table 5.1: Means and SDs for the problem-solving subscales as a function of self-harm history (as assessed at Time1)

	Self-harm in past (N=71)	No self-harm in the past (N = 243)	F	P
PPO	5.99 (SD=5.25)	7.11 SD=5.41)	2.51	.114
NPO	6.75 (SD=5.29)	4.68 (SD=4.62)	9.86	.001
RPS	6.07 (SD=5.04)	6.26 (SD=5.24)	.088	.788
ICS	4.06 (SD=4.11)	3.44 (SD=3.80)	1.25	.236
AS	4.89 (SD=4.49)	3.75 (SD=4.18)	3.70	.049

PPO = Positive problem orientation; NPO= Negative problem orientation; RPS= Rational problem-solving; ICS= Impulsive careless problem-solving and AS= Avoidance problem-solving style.

A one-way between groups multivariate analysis of variance was performed to investigate the differences between individuals who reported self-harm at T1 and those who did not on the social problem-solving subscales. There was a statistically significant difference between those who had reported self-harm and those who did not report self-harm on the combined dependent variables, $F_{(5, 312)} = 3.64$, p =.003; wilks lambda = .94. When the results for the dependent variables were considered separately, using a Bonferroni correction method (which involved comparing the p values of the largest effect to alpha divided by the number of dependant variables (e.g., .05/5 = .01), yielding an adjusted alpha level of .01)), the only dependent variable to reach statistical significance was NPO, $F_{(1, 316)} = 10.26$, p= .001, partial eta squared = .031.

Hypothesis 2: Consistent with the IMV model we hypothesised that those who report self-harm would exhibit higher levels of defeat and entrapment and lower levels of social support than those who do not report self-harm.

Table 5.2: Means and standard deviations for defeat, internal entrapment and social support as a function of self-harm history

	Self-harm in the past (N=71)	No self-harm in the past (N = 245)	F	P
Defeat	24.08 (SD=14.11)	15.39 (SD = 11.75)	26.70	<.001
Internal Entrapment	22.27 (SD= 16.25)	12.13 (SD= 14.03)	27.40	< .001
Social support	21.51 (SD =5.32)	24.17 (SD= 4.68)	16.75	< .001

A one-way between groups multivariate analysis of variance was performed to investigate the differences between individuals who reported self-harm and those who did not in terms

of defeat, internal entrapment and social support. There was a statistically significant difference between those who had reported self-harm and those who did not report self-harm on the combined dependent variables F (3, 311) = 10.79, p <.001; wilks lambda = .906. When the results for the dependent variables were considered separately all were statistical significant, using a Bonferroni adjusted alpha level of .017, the test-statistics were as follows: defeat F (1, 314) = 27.39, p <.001, partial eta squared = .08; internal entrapment F (1, 314)= 26.71, p<.001, partial eta squared = .078 and social support F (1,314)= 16.75, p< .001, partial eta squared = .051.

5.4.3 Correlations

Table 1 shows the zero order correlations for all of the study variables. Due to the high number of correlations a Bonferroni adjusted alpha level of .0025 (.05/20) was employed. All the problem-solving constructs were significantly correlated with each other. PPO was positively correlated with NPO (r = .33, p <.001), RPS (r = .80, p <.001), ICS (r = .50, p <.001) and AS (r = .33, p <.001). NPO was significantly correlated with RPS (r = .49, p <.001), ICS (r = .59, p <.001), and AS (r = .75, p <.001); RPS was positively significantly correlated to ICS (r = .40, p <.001) and AS (r = .49, p <.001) and ICS was also positively correlated with AS (r = .71, p <.001).

5.4.3.1 Relationship between social problem-solving, psychological distress, rumination and goal adjustment.

Hypothesis 3: We hypothesised that NPO, ICS and AS would be positively associated with stress, hopelessness, depression, defeat and entrapment and suicide ideation, whilst PPO and RPS would be negatively associated with these variables.

NPO was positively and significantly associated with stress at T1 (r = .46, p <.001), and at T2 (r = .40, p <.001), with depression at T1 (r = .47, p <.001), and T2 (r = .76, p <.001), hopelessness at T1 (r = .67, p <.001), and at T2 (r = .42, p <.001), suicide ideation at T1 (r = .36, p <.001), and at T2 (r = .31, p <.001) and with internal entrapment (r = .49, p <.001) and defeat (r = .46, p <.001).

AS was positively and significantly associated with stress at T1 (r = .31, p <.001), and at T2 (r = .21, p <.001), with depression at T1 (r = .29, p <.001), and at T2 (r = .29, p <.001), hopelessness at T1 (r = .50, p <.001), and at T2 (r = .26, p <.001), suicide ideation at T1 (r = .24, p <.001), and at T2 (r = .19, p <.01) and with internal entrapment (r = .33, p <.001) and defeat (r = .32, p <.001).

PPO was only found to be negatively associated with stress at T1 (r = -.21, p <.001) and at T2 (r = -.29, p <.001), and with hopelessness T1 (r = .71, p < .001) and at T2 (r = -.28, p <.001) and defeat (r = -.27, p <.001).

RPS was only found to be negatively associated with T1 hopelessness (r = .71, p <.001).

Hypothesis 4: It was hypothesised that brooding rumination would be positively associated with NPO, ICS and AS and negatively associated with PPO and RPS.

Brooding rumination was found to be significantly and positively associated with NPO (r = .49, p <.001), and AS (r = .36, p <.001). Brooding rumination was not associated with RPS.

Hypothesis 5: It was hypothesised that goal disengagement would be positively associated with PPO and RPS and negatively associated with NPO, ICS and AS.

Goal disengagement was found to be significantly negatively associated with PPO ($r = -.19$, $p < .001$) however it was not found to be associated with NPO, RPS, ICS or AS.

Hypothesis 6: It was further hypothesised that goal reengagement would be negatively associated with NPO, ICS and AS and positively associated with PPO and RPS.

Goal reengagement was found to be significantly negatively associated with NPO ($r = -.25$, $p < .001$), however, it was not found to be associated with PPO, RPS, ICS and AS.

Table 5.3 Zero order correlations, mean scores and standard deviations for all study measures

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-																				
2.	.63***	-																			
3.	.72***	.62***	-																		
4	.55***	.70***	.80***	-																	
5.	.16	.08	.62	.16	-																
6.	.51***	.62***	.69***	.76***	.095	-															
7.	.46***	.39***	.68***	.58***	.13	.63***	-														
8.	.33***	.44***	.55***	.76***	.08	.68***	.66***	-													
9.	.14	.07	.15	.19	.86***	.09	.12	-.12	_												
10.	-.075	-.05	-.10	-.09	-.11	-.06	-.08	-.06	-.01	_											
11	-.31***	-.32***	-.40***	-.34***	-.18	-.42***	-.35***	-.28**	-.09	-.01											
12	.66***	.60***	.73***	.62***	.13	.68***	.56***	.49***	-14	-.01	-.32***	_									
13.	.68***	.58***	.78***	.68***	.19***	.72***	.61***	.48	-.20***	.06	-.33	.79***	_								
14.	.74***	.64***	.81***	.66***	.15	.73***	.60***	.50***	-.12	.001	-.34***	.79***	.81***	_							
15.	.47***	.37***	.52***	.42***	.14	.40***	.37***	.30***	-.22	-.05	-.17	.52***	.55***	.54***	_						
16.	.30***	.25***	.35***	.37***	.15	.30***	.24***	.28***	.28	-.09	-.02	.42***	.45***	.40***	.61***	_					
17.	-.21***	-29***	-.17***	-.14	.71***	-.28***	-.14	-.10	.77	-.19***	.08	-21***	-.17	-.27***	-.16	.038	_				
18.	.46***	.40***	.47***	.47***	.67***	.42***	.36***	.31***	.78***	-.08	-.25***	.44***	.49***	.46***	.49***	.39***	.33***	_			
19.	-.02	-.08	-.01	.005	.71***	-.01	-.01	-.05	.83***	-.17	.001	-.02	-.080	-.074	.092	.28	.80***	.49***	_		
20.	.11	.08	.16	.16	.31	.08	.17	.16	.77***	.04	-.13	.13	.11	.14	.13	.07	.50***	.59***	.40***	_	
21.	.31***	.21**	.29***	.29***	.65***	.26***	.24***	.19	-.80***	.06	-.16	.30***	.33***	.32***	.36***	.29***	.33****	.75***	.49***	.71***	-
Mean	6.86	6.53	11.66	11.41	3.74	4.79	5.58	6.68	23.56	11.11	20.97	8.88	5.36	17.25	11.41	10.75	6.84	5.11	6.20	3.54	3.98
SD	3.23	3.22	10.67	11.66	3.92	5.18	1.45	1.59	5.03	3.13	3.88	9.15	6.71	12.74	3.44	3.44	5.37	4.83	5.18	3.86	4.26

1.StressT1; 2. StressT2; 3.T1 Depression; 4. T2 depression; 5. T1 Hopelessness; 6. T2 hopelessness; 7. T1 suicide ideation; 8. T2 suicide ideation; 9. Social support; 10. Goal disengagement; 11. Goal reengagement; 12. External entrapment; 13. Internal entrapment; 14. defeat; 15. brooding; 16. reflection; 17. Positive Problem Orientation; 18. Negative Problem Orientation; 19. Rational Problem Solving; 20. Impulsive/Careless Style; 21. Avoidance Style.

*Correlation is significant at ***p <.001

5.4.4 Social problem-solving as a predictor of psychological distress

Hypothesis 7: It was hypothesised that NPO, ICS and AS would be the strongest social problem-solving predictors of hopelessness and suicide ideation at T1 and T2 whilst controlling for depression at T1.

A series of hierarchical regression analyses was conducted to test whether social problem-solving predicted hopelessness and suicide ideation at time 1(T1) and time 2 (T2) whilst controlling for depression at time 1.

Table 5.4: Hierarchical regression analysis of social problem-solving as a predictor of hopelessness at T1 with depression being controlled for at T1

Step/predictor	β	ΔR^2 for step	total R^2
1. Depression	.620***	.38***	.38**
2. Depression	.399**	.16***	.54***
PPO	-.213**		
NPO	.305***		
RPS	.106		
ICS	-.001		
AS	.176**		

PPO- positive problem orientation, NPO – negative problem orientation, RPS – rational problem-solving, ICS – impulsivity/careless style and AS – avoidance style
* P< .05; ** p < .01; *** p< .001

Table 5.4 shows the output for the multiple regression analysis, investigating whether the individual social problem-solving subscales predict hopelessness at T1. After controlling for depression at T1 the additional variance accounted for by the problem-solving constructs was 16%, F (6, 315) 62.39, p< .001. The problem-solving constructs found to make a significant contribution to the model were PPO (β = -.213, t (315) = -3.003, p =.003); NPO (β = .305, t (315) = 4.66, p <.001) and AS (β = .176, t (315) = 2.55, p =.011).

Table 5.5: Hierarchical regression analysis of social problem-solving as a predictor of hopelessness at T2 with depression and hopelessness being controlled for at T1

Step/predictor	β	ΔR^2 for step	total R^2
1. Depression	.689***	.588***	.588***
2. Depression	.563***	.028**	.616**
Hopelessness	.476***		
PPO	-.132		
NPO	.021		
RPS	-.015		
ICS	-.051		
AS	- .017		

PPO- positive problem orientation, NPO – negative problem orientation, RPS – rational problem-solving, ICS – impulsivity/careless style and AS – avoidance style
* p< .05; ** p < .01; *** p< .001

Table 5.5 shows the output for the multiple regression analysis. The inclusions of the social problem-solving constructs as predictors of hopelessness at T2 after controlling for depression and hopelessness at T1 accounted for an additional 2.8% of the variance (F (7, 212) 48.54, p< .001. None of the problem-solving constructs was found to make an individual significant contribution to the final model.

In summary, social problem-solving was found to account for an additional 16% of the variance at T1 whilst controlling for depression. The specific constructs of problem-solving which were found to make a significant contribution were PPO, NPO and AS. At T2 none of the problem-solving constructs was found to significantly predict suicide ideation whilst controlling for T1 depression and hopelessness.

Table 5.6: Hierarchical regression analysis of social problem-solving as a predictor of suicide ideation at T1 with depression being controlled for at T1

Step/predictor	β	ΔR^2 for step	total R^2
1. Depression	.658***	.403***	.403***
2. Depression	.628***	.006	.410
PPO	-.098		
NPO	- .035		
RPS	.035		
ICS	.095		
AS	-.025		

PPO- positive problem orientation, NPO – negative problem orientation, RPS – rational problem-solving, ICS – impulsivity/careless style and AS – avoidance style
* p< .05; ** p < .01; *** p<.001

Table 5.6 shows the output for the multiple regression analysis, investigating whether social problem-solving predicts suicide ideation at T1 after T1 depression was controlled.

Problem-solving accounted for an addition 0.6% of the variance, but was non-significant
and none of the individual problem-solving constructs was found to have a significant
effect.

**Table 5.7: Hierarchical regression analysis of social problem-solving as a predictor of
suicide ideation at T2 with T1 depression and T1 suicide ideation being controlled for**

Step/predictor	β	ΔR^2 for step	total R^2
1. Depression	.163***	.523***	.308***
2. Depression	.185**	.007	.598
Suicide ideation	.610***		
PPO	**.**082		
NPO	-.004		
RPS	.072		
ICS	.062		
AS	-.055		

PPO- positive problem orientation, NPO – negative problem orientation, RPS – rational problem-solving,
ICS – impulsivity/careless style and AS – avoidance style
* $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.7 shows the output for the multiple regression analysis, investigating whether
social problem-solving predicts suicide ideation at T2 after depression and suicide ideation
were controlled for at T1. Problem-solving accounted for an addition 0.7% of the variance
($F_{(7, 211)} = 33.96$, $p < .001$) but none of the problem-solving subscales was found to make
a significant contribution.

In summary, social problem-solving was not found to predict suicide ideation at T1 or T2
whilst controlling for depression at T1 or baseline mood/suicidal ideation in the T2
analsysis. Therefore hypothesis 7 was only partially supported in that social problem-
solving and in particular PPO, NPO and AS predicted hopelessness at T1 whilst
controlling for depression.

5.4.5 Moderation analysis

A series of hierarchical regression analyses were used to test (hypothesis 8) whether
brooding rumination, (hypothesis 9) NPO, ICS and AS would moderate the defeat-
entrapment relationship and (hypothesis 10) whether goal reengagement moderates the
entrapment-suicide ideation relationship as predicted by the IMV model.

Prior to analysis, all of the data were centred before inclusion in the regression analyses as
recommended by Aiken and West (1991). In the first step of each regression the predictor

and moderating variables were entered. Step 2 involved entering a multiplicative term to test for interaction effects. Significant interactions were plotted at high and low levels of each of the interaction terms, consonant with Aitken and West (1991). These interactions were then probed post-hoc using simple slope analysis to determine whether either slope significantly differed from zero, as recommended by Aitken and West (1991).

Hypothesis 8: Following the IMV model we predicted that rumination, specifically brooding would moderate the defeat-entrapment relationship.

Hierarchical regression analyses were conducted to test whether rumination moderated the defeat-entrapment relationship (see Figure 5.3). Three regression analyses were conducted in relation to entrapment: (i) total entrapment, (ii) external entrapment and (iii) internal entrapment for both brooding and reflective pondering (i.e., 6 in total). As significant findings were only found for internal entrapment, the outputs for the total and external entrapment are not reported here.
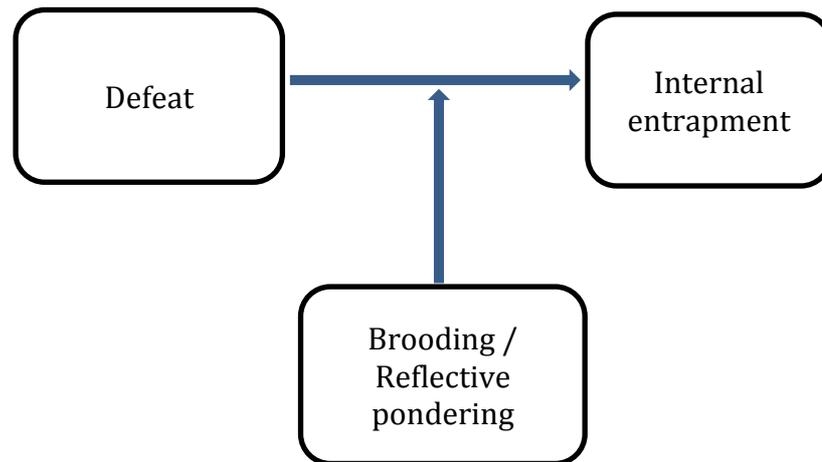
Figure 5.1: Diagrammatic representation of brooding and reflective pondering as moderators of the defeat-entrapment relationship

Firstly, defeat and brooding rumination were entered at step 1, explaining 68% of the variance in internal entrapment. After entry of the defeat by brooding interaction at step 2, R square change indicated that the additional variance explained by the model was an additional .2%, which was found to be non-significant (F (3,312)= 222.58, ns; see Table 5.8).

For the second regression, defeat and reflective pondering were entered at step 1 explaining 68% of the variance. After entry of the defeat by reflective pondering interaction at step 2, R square change indicated that the additional variance explained by

the model was .3%, which was also found to be non-significant (F (3,312)= 225.61, ns; see Table 5.8).

Table 5.8: Hierarchical regression analyses of brooding and reflective pondering as a moderator of the defeat-entrapment relationship.

Step/variable	β at step	ΔR^2 for step	Total R^2
Defeat	.711***		
Brooding	.156***	.679***	.679***
Defeat x brooding	.050	.002	.682
Defeat	.736***		
Reflective pondering	.156***	.682	.682
Defeat x reflective pondering	.054	.003	.685

*p < .05; ** p < .005, ***p <.001

In relation to hypothesis 8 brooding and reflective pondering were not found to moderate the defeat-internal entrapment relationship.

Hypothesis 9: Based on the IMV model we predicted that NPO, ICS and AS would moderate the defeat-entrapment relationship at T1.

To investigate hypothesis 9, five separate regression analyses were conducted, one for each of the social problem-solving subscales (i.e., PPO, NPO, RPS, ICS and AS) to investigate each as a moderator of the defeat-internal entrapment relationship.
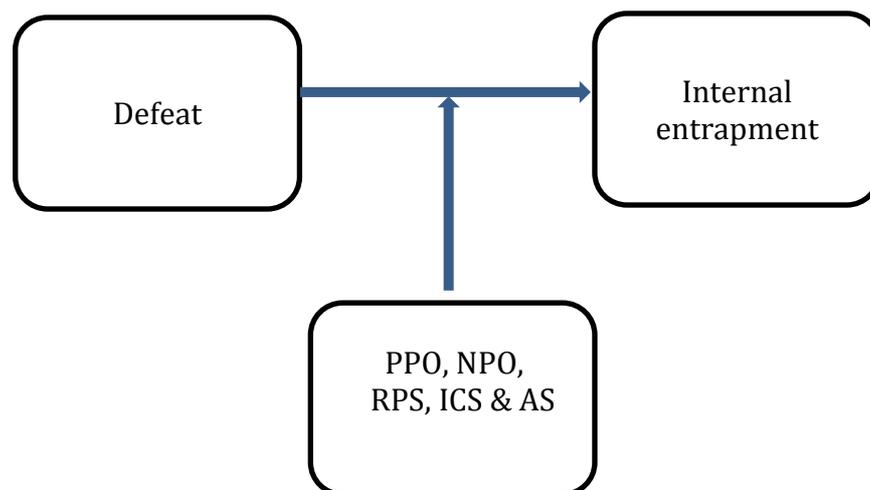
Figure 5.2: Diagrammatic representation of PPO, NPO, RPS, ICS and AS as moderators of the defeat-entrapment relationship

Defeat and positive problem orientation (PPO) were entered at step 1 explaining 67% of the variance (see Table 5.9). After entry of the defeat by PPO interaction at step 2 R squared change indicated that the additional variance accounted for was .3% which was

found to be non-significant F (3,313) 210.68, ns. Positive problem orientation was not found to moderate the defeat-entrapment relationship.

Table 5.9: Hierarchical regression analysis of positive problem-orientation as a moderator of the defeat-entrapment relationship.

Step/variable	β at step	ΔR^2 for step	Total R^2
Defeat	**.**844***		
PPO	.070*	.666	.666
Defeat x PPO	.058	.003	.669

*p < .05; ** p < .005, ***p <.001

Defeat and negative problem orientation were entered at step 1 explaining 73% of the variance (see Table 5.10). After entry of the defeat by NPO interaction at step 2 R squared change indicated that the additional variance accounted for .1% which was not found to be significant F (3-313) 279.92, ns.

Table 5.10: Hierarchical regression analysis of negative problem-orientation as a moderator of the defeat-entrapment relationship.

Step/variable	β at step	ΔR^2 for step	Total R^2
Defeat	.788***		
NPO	.127***	.728	.728
Defeat x NPO	-.001	.000	.728

*p < .05; ** p < .005, ***p <.001

Negative problem orientation was, therefore, found not to moderate the defeat-entrapment relationship.

Defeat and avoidance problem-solving style were entered at step 1 explaining 72% of the variance. After entry of the defeat by AS interaction at step 2 R squared change indicated that there was no additional variance to the model, F (3,13) 268.31, ns.

Table 5.11: Hierarchical regression analysis of avoidance style problem-solving as a moderator of the defeat-entrapment relationship.

Step/variable	β at step	ΔR^2 for step	Total R^2
Defeat	.825***		
AS	.069*	.720	.720
Defeat x AS	-.002	.000	.720

*p < .05; ** p < .005, ***p <.001

Avoidance problem-solving style was not found to moderate the defeat-entrapment relationship.

Defeat and impulsive/careless problem-solving style were entered at step 1 explaining 66% of the variance. After entry of the defeat by ICS interaction at step 2 R squared change indicated that there was no additional variance to the model, F (3,13) 204.99, ns.

Table 5.12: Hierarchical regression analysis of avoidance style problem-solving as a moderator of the defeat-entrapment relationship.

Step/variable	β at step	ΔR^2 for step	Total R^2
Defeat	.816***		
ICS	-.008	.663	.663
Defeat x ICS	-.009	.000	.663

*p < .05; ** p < .005, ***p <.001

Impulsive-careless problem-solving style was not found to moderate the defeat-entrapment relationship.

Hierarchical regression analysis was then conducted to determine whether rational problem-solving (RPS) moderated the relationship between defeat and entrapment. Defeat and rational problem-solving were entered in the first step followed by the defeat by rational problem-solving multiplicative term at step two to test for interaction effects. At step 2, there was a significant effect for defeat (β= .833, t (312) = 2.807, p < .001) and RPS (β= .148, t (312) = 2.807, p<001) and the defeat-RPS interaction was also significant (β= .89, t (312)= 2.807, p =.005). The total variance explained by the model was 68.7% (F (3,311) = 230.55, p < .001).

Table 5.13: Hierarchical regression analysis of rational problem-solving as a moderator of the defeat-internal entrapment relationship.

Step/variable	β at step	ΔR^2 for step	Total R^2
1. **Defeat**	.825***		
RPS	.141***	.680***	.680***
2. **Defeat**	.833***		
RPS	.148***		
Defeat x RPS	.089**	.008**	.687

*p < .05; ** p < .005, ***p <.001
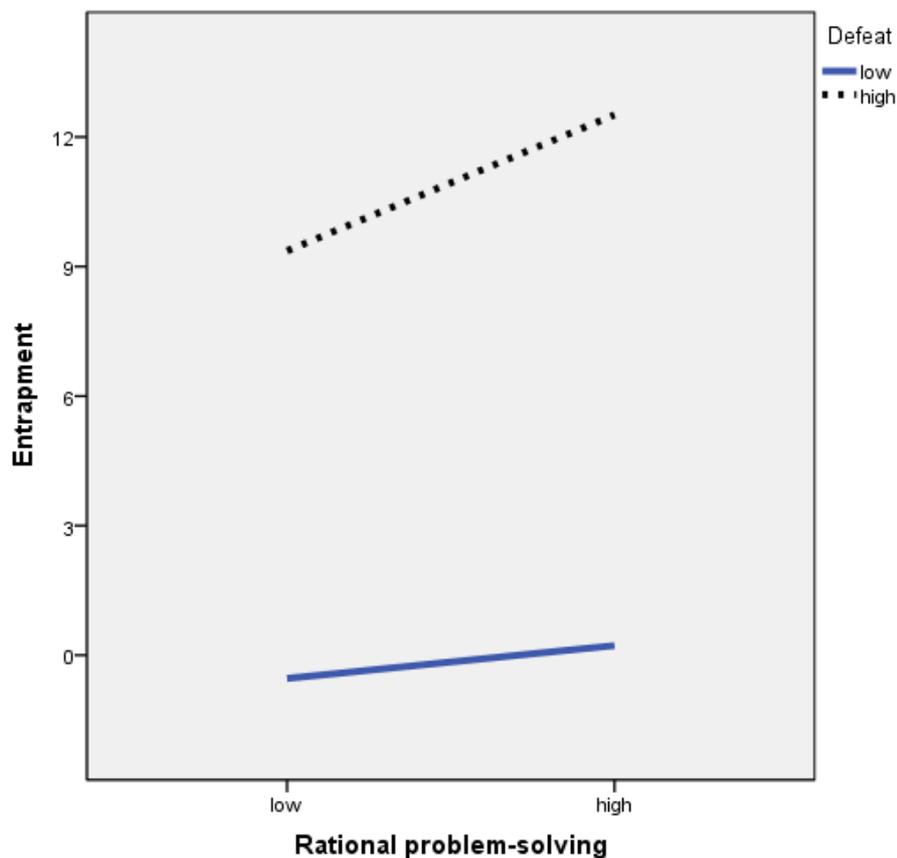
Figure 5.3: Interaction of RPS as a moderator of the defeat-entrapment relationship

To probe the interaction consistent with Aitken and West (1991), the regression lines were plotted at high (1 standard deviation above the mean) and low (1 standard deviation below the mean) levels of defeat and RPS (see Figure 5.3).

Further tests were conducted on the high and low defeat lines to determine if they differed significantly from zero. Application of the procedure outlined by Aitken and West revealed that the high defeat slope was significantly different from zero (β = .240, t (314)

5.07, p < .001) and that the low defeat slope was not significant (β = .057 t (314) 1.29, ns). In other words, those participants who were high on defeat and high on RPS reported significantly higher levels of entrapment than the low levels of RPS (Figure 5.5).

In summary rumination did not moderate the defeat-internal entrapment relationship and only one construct of social problem-solving, RPS was found to moderate the defeat-internal entrapment relationship.

Hypothesis 10: Based on the IMV model it was predicted that goal reengagement would moderate the entrapment-suicidal ideation relationship.
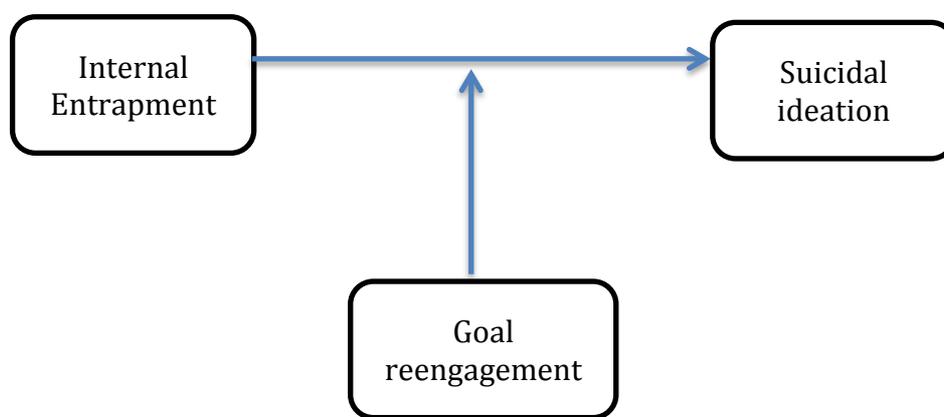
Figure 5.4: The moderation of goal reengagement in the internal entrapment-suicidal ideation relationship

Hierarchical regression analysis was conducted to determine whether goal reengagement moderated the relationship between internal entrapment and suicide ideation at T1 (see Table 5.14). Internal entrapment and goal reengagement were entered in the first step followed by the internal entrapment goal reengagement multiplicative term at step two to test for interaction effects. At step 2, internal entrapment (β= -.550, t (314) = 11.46, p <.001), goal reengagement (β=-.092, t (314) = -1.977,p <.05) and the internal entrapment goal reengagement interaction (β= -.110, t (312) = -2.385, p <.05) were all significant predictors. The variance explained by the model was 39.7% (F (3,314) = 68.996, p < .001).

Table 5.14: Hierarchical regression analysis of goal reengagement as a moderator of the internal entrapment-suicide ideation (T1) relationship

Step/variable	β at step	ΔR^2 for step	Total R^2
1.Entrapment	.580***		
Reengagement	-.103*	.386***	.386***
2. **Entrapment**	.550***		
Reengagement	-.092*		
Reengagement x entrapment	-.110*	.011**	.397*

Reengagement = goal reengagement; entrapment = internal entrapment

*p < .05; ** p < .005, ***p <.001
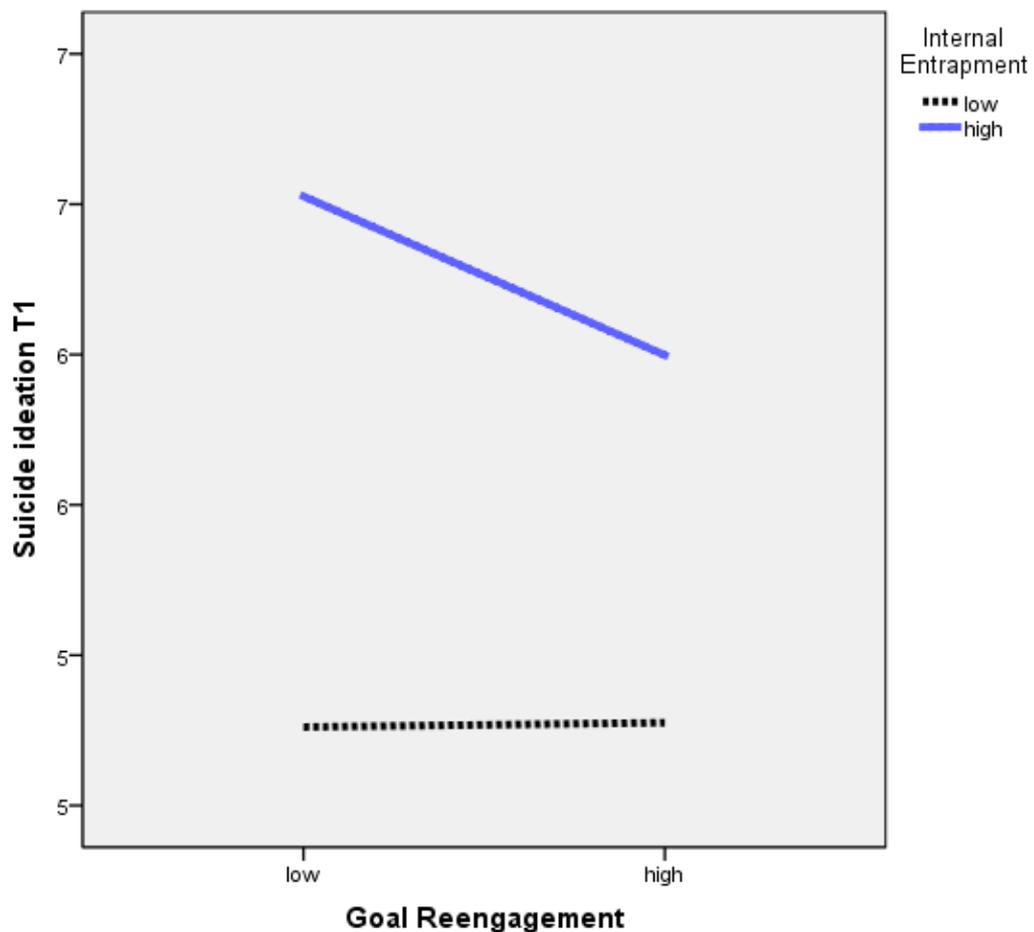
Figure 5.5: Interaction of goal reengagement as a moderator of the internal entrapment-suicide ideation relationship

To probe the interaction, consistent with Aitken and West (1991), the regression lines were plotted at high (1 standard deviation above the mean) and low (1 standard deviation below the mean) levels of internal entrapment and goal reengagement (see Figure 5.5). Further tests were conducted on the high and low internal entrapment lines to determine if they differed significantly from zero. Application of the procedure outlined by Aitken and West revealed that the high internal entrapment slope was significantly different from zero ($\beta = -.133$ t (314) = -2.765, p <.01) and the low internal entrapment slope was not significant ($\beta = -.032$ t (314) = -.615, ns). In other words, those participants who were high on internal entrapment and low on goal reengagement reported significantly higher levels of suicide ideation than those high on goal reengagement (Figure 5.7).

In summary the hypothesis that goal reengagement would moderate the internal entrapment-suicide ideation relationship was supported.

5.4.6 Mediation Analysis

In the next section, the role of social problem-solving and rumination as mediators of the defeat-entrapment relationship is explored. Following the procedure outlined by Baron and Kenny (1986), to test for mediation, a series of hierarchical regressions were performed, as outlined in Tables 5.15 to 5.17.

Mediation analysis was performed to determine whether the relationship between defeat and entrapment was mediated by (hypothesis 11) NPO, ICS and AS and (hypothesis 12) rumination. Regression analyses in relation to PPO, RPS and ICS as potential mediators of the defeat-entrapment relationship yielded no significance for mediation and in the interests of brevity are not reported here. With regards to rumination, reflective pondering also did not mediate the defeat-entrapment relationship.

Table 5.15 shows the output for the hierarchical multiple regression analyses exploring the relationship between defeat and internal entrapment with NPO assessed as a mediator in the defeat-entrapment relationship.
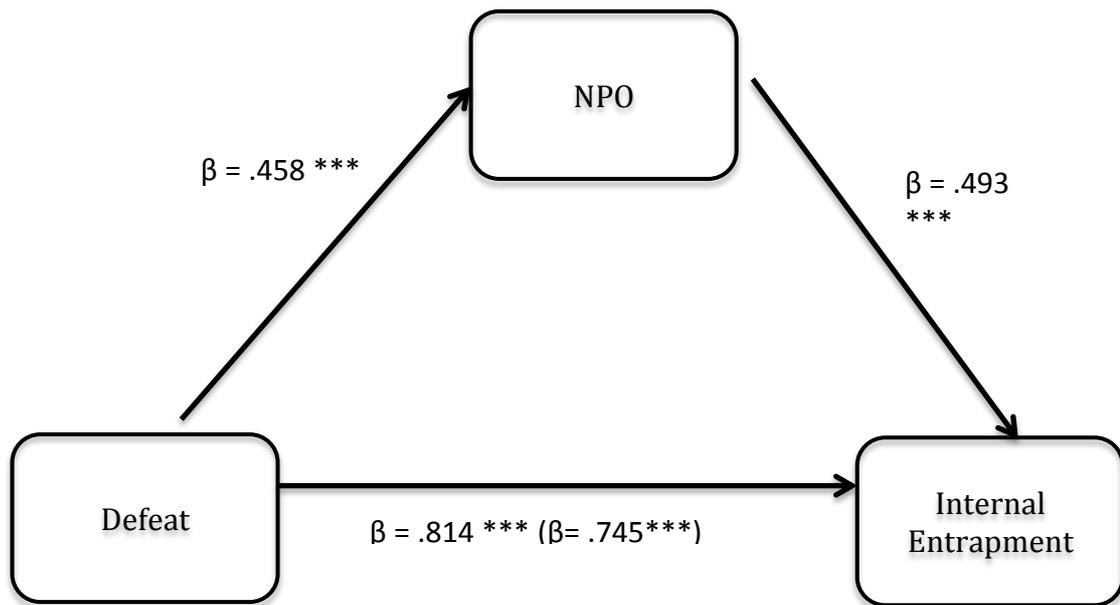
Figure 5.6: NPO as a mediator in the defeat-entrapment relationship

Figure 5.6 shows that NPO acts as a partial mediator of the defeat-entrapment relationship, as is shown by the reduction in the beta from .814 to .745 whilst still remaining significant. This reduction was confirmed as significant with a post hoc Sobel test (see below).

Table 5.15: Hierarchical regression analysis of the defeat-entrapment relationship with NPO as a mediator

Step/predictor	β (step 1)	R^2 change for step	Total R^2 change	P
1. Defeat	.814	.663***	.663***	<.001
2. Defeat	.745	.681***	.018***	<.001
NPO	.152			<.001

*** P < .001

Table 5.15 shows that defeat was entered at step 1, explaining 66% of the variance in internal entrapment. After entry of NPO at step 2 the total variance explained by the model as a whole was 68%, $F_{(2, 319)} = 341.17$, $p < .001$. NPO explained an additional 1.8% of the variance in internal entrapment after controlling for the effects of defeat, R squared change = .681, F change (1, 319) =18.297, $p < .001$. In the final model, NPO was significant (β= .152, $p < .001$), and the beta weight for defeat was reduced but still significant (β= .745, $p < .001$), suggesting that NPO partially mediates the relationship between defeat and internal entrapment.

A Sobel test was conducted to test whether there was a significant reduction in the beta weight of defeat. The reduction in beta weight (.814 to .745) was significant ($Z = .637$, $p < .001$) suggesting partial mediation of NPO on the relationship between defeat and internal entrapment. Therefore, NPO partially mediates the relationship between defeat and internal entrapment.

Table 5.16 shows the output for the hierarchical multiple regression investigating the relationship between defeat and internal entrapment with AS assessed as a mediator in the defeat-entrapment relationship.
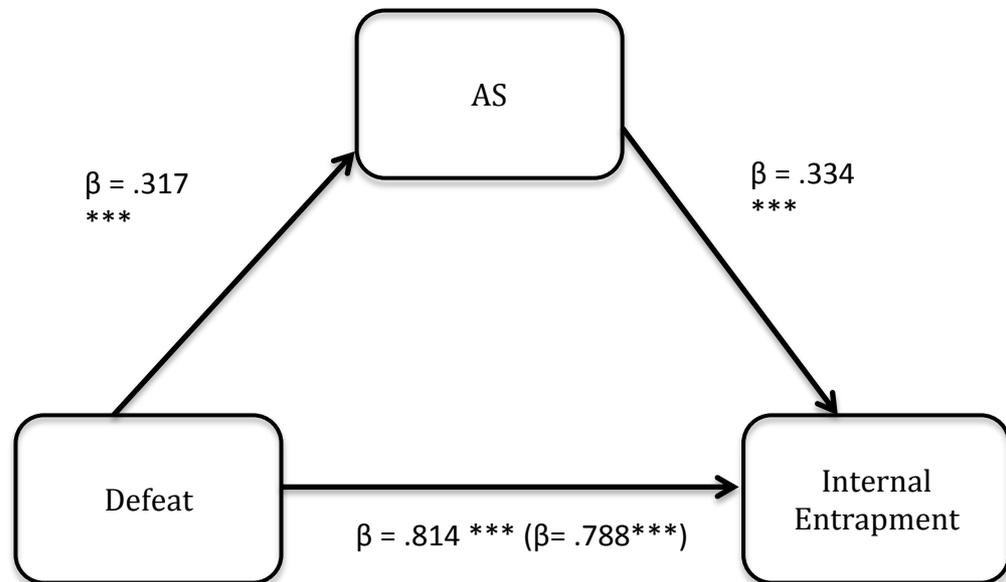
Figure 5.7: AS as a mediator in the defeat-entrapment relationship

Figure 5.7 shows that partial mediation was evident in the defeat-entrapment relationship with AS acting as a mediator, this was supported by the reduction in the beta from .814 to .788 with the latter remaining significant in the final model (full details below).

Table 5.16: Hierarchical regression analysis of the defeat-entrapment relationship with AS as a mediator

Step/predictor	β (step 1)	R^2 change for step	Total R^2 change	P
1. Defeat	.814	.663***	.663***	<.001
2. Defeat	.788	.667*	.006*	<.001
AS	.084			.013

AS: Avoidance problem style; Entrapment: internal entrapment

*** P < .001; * P < .05

Table 5.16 shows that defeat was entered at step 1, explaining 66% of the variance in internal entrapment. After entry of AS at step 2 the total variance explained by the model was 67%, F (2, 319) = 323.2, p < .001. AS explained an additional .6% of the variance in internal entrapment after controlling for the effects of defeat, R square change = .006, F change (1, 319) = 6.19, p = .013. In the final model AS was significant (β= .084, p = .013), and the beta weight for defeat was reduced but still significant (β= .788, p < .001), suggesting that AS partially mediates the relationship between defeat and internal entrapment.

A Sobel test was conducted to test whether there was a significant reduction in the beta weight of defeat. The reduction in beta weight (.814 to .788) was found to be significant (Z = 2.27, p = .02), suggesting partial mediation with AS on the defeat internal entrapment relationship.

Therefore, AS partially mediates the defeat-internal entrapment relationship.
In summary NPO and AS were both found to partially mediate the defeat-internal entrapment relationship.

Brooding rumination mediating the defeat-entrapment relationship.

Table 5.17 shows the output for the hierarchical multiple regression investigating whether brooding rumination mediates the relationship between defeat and internal entrapment.
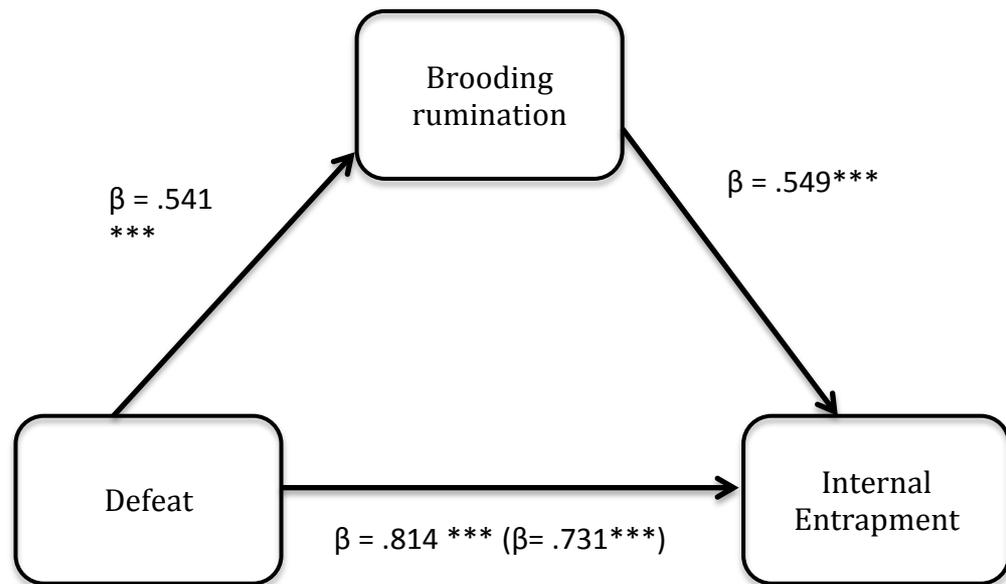
Figure 5.8: Brooding rumination as a mediator in the defeat-entrapment relationship

Figure 5.8 shows that partial mediation occurred in the defeat-entrapment relationship with brooding rumination acting as a mediator, this was shown with the reduction in the beta from .814 to .731 with the latter remaining significant in the final model. This was confirmed as significant with a post hoc Sobel test (see below).

Table 5.17: Hierarchical regression analysis of the defeat-entrapment relationship with brooding rumination as a mediator

Step/predictor	β (step 1)	R2 change for step	Total R2 change	P
1. Defeat	.814	.663***	.663***	<.001
2. Defeat	.731	.680***	.017***	<.001
Brooding rumination	.153			<.001

*** p < .001

Table 5.17 shows that defeat was entered at step 1, explaining 66% of the variance in internal entrapment. After entry of brooding rumination at step 2 the total variance explained by the model was 68% F (2, 219) = 338.481, p < .001. Brooding rumination explained an additional 1.7% of the variance in internal entrapment after controlling for the effects of defeat, R squared change = .017, F change (1, 319) = 16.48, p < .001. In the final model, brooding rumination was significant (β= .153, p < .001), and the beta weight

for defeat was reduced but still significant (β= .731, p < .001), suggesting that brooding rumination partially mediates the relationship between defeat and internal entrapment. A Sobel test was conducted to test whether there was a significant reduction in the beta weight of defeat. The reduction in beta weight (.814 to .731) was found to be significant (Z = 3.81, p < .001), suggesting partial mediation with brooding rumination on the defeat internal entrapment relationship.

Therefore, to conclude brooding rumination partially mediates the defeat internal entrapment relationship.

5.4.7 Multiple mediation

To supplement the individual mediation analyses, multiple mediation analyses were conducted to the relative mediating effect of NPO, AS and brooding rumination on the relationship between defeat and entrapment.
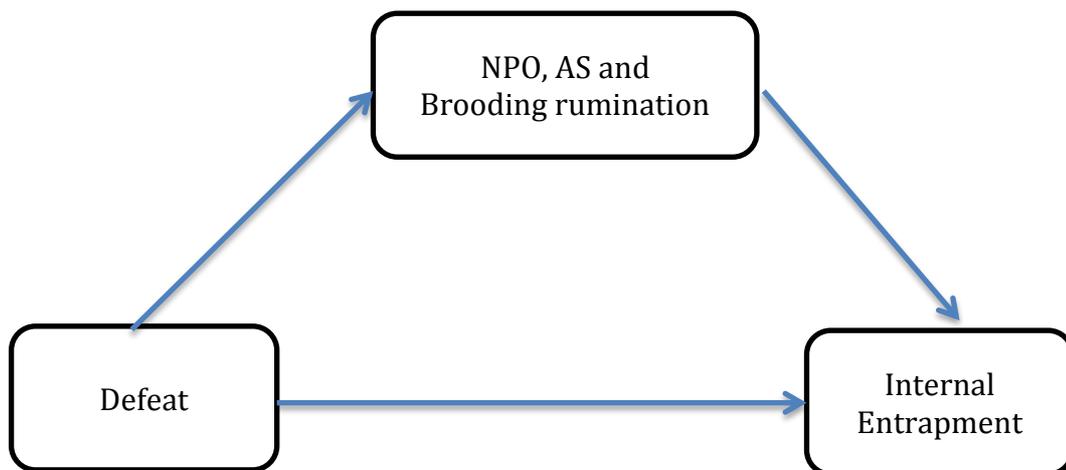
Figure 5.9: Multiple mediation of model with NPO, AS and brooding rumination as mediators of the defeat-entrapment relationship

Regression analysis were conducted to examine mediation effects in a multiple mediator model, following the procedure described by Preacher and Hayes (2008). The procedure involves calculating the total effect of an independent variable (IV) on a dependent variable (DV), given as a regression coefficient; the direct effect of an IV on a DV after factoring out the effect of the mediator on the DV, given as a regression coefficient; and then calculating the effect of the mediators on the DV (total effect of IV on DV – direct

effect of IV on DV). Mediation is considered to have occurred when the difference between the total and direct effect is significant.

In this model, the IV was defeat, the DV was internal entrapment and the mediators were NPO, AS and brooding rumination (in three mediating variables). Baseline measures for all the variables were entered as covariates in the model. Bootstrapping techniques were used to estimate the indirect effect of the IV on the DV based on 1000 bootstrap samples. Bootstrapping is recommended when using small samples in multiple mediator models, as the assumption of normality of the sampling distribution of the total and specific indirect effects may not be met (Preacher & Hayes, 2008).

The mediation analysis showed that, when considered together, the three variables mediated the relationship between defeat and entrapment. The total effect of defeat on entrapment was .429, p < .001 and the direct effect of defeat on entrapment with mediators was .368, p < .001. The difference between the total and direct effects minus the total direct effect through the three mediators had a point estimate of .062 and a bootstrap 95% CI of .033 to .094 (therefore there was a significant difference between the total and direct effect of defeat on entrapment). Analysis of the specific indirect effects showed that NPO and brooding rumination were significant mediators of the defeat-entrapment relationship with a 95% bootstrap CI of .014 to .063 and NPO as .006 to .066 respectively.

Therefore, this shows that both NPO and brooding rumination were significant mediators of the relationship between defeat and internal entrapment. Whereas, AS was not found to mediate the defeat-internal entrapment relationship in this model.

5.5 Discussion

The current study had two aims, first to work explicitly within the IMV model to test how social problem-solving fits within the model. Second, to further investigate the relationship between social problem-solving, rumination, goal adjustment and suicidality.

In the following section, the results are summarised (see Table 5.18) together with an appraisal of whether the findings support the study hypotheses. Partial support was found for hypothesis 1 where individuals who reported self-harm were found to be significantly different in NPO compared to individuals with no history of self-harm. Full support was found for hypothesis 2, where individuals who reported self-harm were found to have higher levels of defeat and entrapment with lower levels of social support than those with no history of self-harm.

The third hypothesis investigated the relationship between the subscales of the SPSI-R with psychological distress. RPS and ICS were the only two subscales, which were not significantly related to stress, and internal entrapment, whilst RPS was also found to have no significant relationship with defeat and suicide ideation. Partial support was found for hypothesis 4 whereby NPO and AS were associated with brooding rumination.

Hypotheses 5 and 6 investigated the relationship between goal disengagement, goal reengagement and the subscales social problem-solving. Partial support was found for both hypotheses whereby goal disengagement was found to be negatively associated with PPO (hypothesis 5), whilst goal reengagement was negatively associated with NPO (hypothesis 6).

To test hypothesis 7, the utility of the subscales social problem-solving subscales as statistical predictors of psychological distress was tested. Only NPO and AS were found to predict hopelessness at Time 1.

The next series of hypotheses investigated the moderating effects of rumination (hypothesis 8), the social problem-solving subscales (hypothesis 9) and goal reengagement (hypothesis 10) within the IMV model. Only partial support was found for these hypotheses as only RPS was found to moderate the defeat-entrapment relationship

The final set of analyses investigated mediation analysis whereby it was found that NPO, ICS and brooding rumination mediated the defeat-entrapment relationship (hypothesis 11 and 12 respectively).

5.5.1 Differences between groups

We hypothesised that, individuals who report self-harm would exhibit higher scores on the subscales of NPO, AS, ICS, and lower in PPO and RPS compared to those who did not report self-harm (hypothesis 1). However, contrary to the hypothesis, the analyses yielded only one significant difference between the groups, for NPO. The groups did not differ significantly on the other subscales These findings are similar to Gibbs et al. (2009) whereby they found that NPO and ICS scores were higher in suicide attempters than depressed and non-depressed groups and the suicide attempter and depressed groups were lower in PPO than either of the non-depressed groups. Taking Gibbs and the present results together the data suggest that individuals who report self-harm are more negative in their orientation towards problems that they encounter compared to those who have not self-harmed. Problem orientation reflects perceived control and ability to handle or cope with a problem. Those with a negative problem orientation are more likely to view a problem as a threat to their well-being, have self-doubt in their problem-solving abilities and more quickly become distressed when faced with a problem (D'Zurilla et al., 2004). Therefore it is not surprising that negative problem orientation is associated with self-harm. This runs in parallel with Williams' notion of entrapment, where perceived ability to escape from an aversive environment triggers escape motivations (Williams et al., 2005).

The present study also found that individuals who reported self-harm were higher in defeat, entrapment and lower in social support than individuals who did not report self-harm. This finding is consistent with the findings of Rasmussen et al. (2010). This suggests that individuals who are feeling that they are in a defeating situation and have the perception that they are unable to escape from this, due to the perceived absence of rescue factors are more likely to be individuals who have reported self-harm at some point in their life.

5.5.2 Relationship between social problem-solving and psychological distress

It was hypothesised that dysfunctional problem-solving (NPO, ICS & AS) would be positively associated with stress, hopelessness, depression and suicide ideation whilst PPO and RPS would be negatively associated. Both NPO and AS were significantly correlated

with stress, hopelessness, depression and suicide ideation at T1 and T2. The relationships were in the expected directions and the strongest relationship was between NPO and depression at T2 (r = .76), which was the only relationship to strengthen over time. There was a medium correlation (Pearson's r) between NPO and hopelessness at T1(r = .59) but this did not strengthen over time.

ICS was not significantly associated with stress, which is inconsistent with the reporting's of D'Zurilla et al. (1998) who found it to be positively associated with stress. This is an unexpected finding but it is worthy of note that D'Zurilla et al. (2002) did not measure stress but anxiety when testing the reliability of the scales. It could be that there is no relationship between one's impulsivity to solve problems and stress.

PPO was also found to be negatively associated with depression, hopelessness and suicide ideation, although it was not correlated with hopelessness at T1 or suicide ideation at T2. It is worthy of note that although this subscale was not in the expected direction with the dysfunctional SPSI-R subscales, the relationship between PPO and psychological distress was in the expected direction. When comparing these correlations with D'Zurilla et al. (2002) the correlations were slightly weaker in this study. This means that the more that an individual views a problem as a challenge then the less likely they are to feel stressed or be experiencing low mood.

RPS was only found to be positively but weakly associated with hopelessness at T2. Based on previous research, RPS is the subscale that has the least consistent results in the literature (D'Zurilla et al., 1998). Indeed it is routinely found not to have a significant relationship with other key study variables. For example D'Zurilla et al. (2002) found that it was not significantly associated with depression and that its relationship with hopelessness and suicidality was weak. In another study, D'Zurilla et al. (1998) employed the long form of the SPSI-R (which makes comparison difficult) which operationalized RPS as five subscales. In this case none of the five subscales was correlated with depression, and only two correlated with the suicide probability scale and hopelessness.

It was also hypothesised that the dysfunctional problem-solving subscales (NPO, ICS & AS) would be positively related to defeat and entrapment and that the functional subscales (PPO & RPS) would be negatively associated with defeat and entrapment. In the present sample, defeat was significantly correlated with all the SPSI-R subscales (except RPS) in

the expected directions. The strongest relationship was with NPO followed by AS, with the weakest relationship being with ICS. These results show that there is an association between feeling defeated and having a negative attitude towards problems and avoiding problems.

Internal and external entrapment were both found to be positively and significantly related to dysfunctional problem-solving, apart from ICS which was only significantly associated with external entrapment. This suggests that if one scores higher on dysfunctional social problem-solving style and orientation then they are likely to also report high levels of internal and external entrapment.

5.5.3 The relationship between social problem-solving, brooding rumination, goal disengagement and reengagement

The study hypothesis that brooding rumination would be positively associated with the dysfunctional constructs of social problem-solving (NPO, AS and ICS) was supported. NPO was found to have the strongest association with brooding rumination. This supports previous research that states that the more one tends to ruminate the more likely they are to have a negative orientation towards problems and then potentially dwell more on their problems, than trying to solve them (Treynor et al, 2003).

Goal disengagement was found to be negatively associated with PPO and RPS whilst goal re-engagement was found to be negatively associated with NPO, ICS and AS. These results suggest that a greater tendency to disengage from goals that are no longer worth pursuing is associated with poorer rational problem-solving (which involves weighing up the pros and cons and see problems as a challenge). In contrast the negative association between goal re-engagement and the dysfunctional subscales (NPO, ICS and AS) means that you are less likely to re-engage with new goals if you feel that problems are a threat and you are more likely to avoid dealing with problems.

5.5.4 Social problem-solving as a predictor of psychological distress

This study hypothesised that dysfunctional social problem-solving constructs would the strongest predictors of hopelessness and suicide ideation at T1 and T2, whilst controlling for depression (hypothesis 7). In this study, we were keen to explore the specific contributions of different types of problem-solving orientation and skills to explain the variance in psychological distress. The hypothesis was only partially supported because of

the significant findings to emerge from the analyses that were that PPO, NPO and AS predicted hopelessness at T1. None of the social problem-solving subscales predicted suicide ideation at (Time 1 or Time 2) or hopelessness at Time 2. These findings add to the extant published literature, which is littered with inconsistent findings. For example, Clum et al. (1996) also found that problem orientation was not related to suicide ideation when depression was controlled for. Furthermore, Clum et al. (1997) found that it was the avoidance subscale, as opposed to the approach subscale, that uniquely predicted suicide ideation. By contrast Dieserud et al. (2000) found that problem-solving deficits made a unique contribution independently of depression, in the prediction of suicide attempts. However, it is important to highlight that Dieserud et al. (2000) used a composite measure of social problem-solving which includes skills and orientation rather than testing the individual subscales. The results of the present study are consistent, with D'Zurilla et al. (1998) who also found that NPO was a predictor of hopelessness. Taking the predictive analyses as a whole, the data suggest that social problem-solving may not be uniquely predictive of suicidal ideation. It may be that social problem-solving is associated with depression and it is the depression which is, in part, responsible for the increased risk of suicidal ideation and behaviour rather than the social problem-solving itself. Indeed, in terms of the IMV model social problem-solving is not hypothesised to be a proximal predictor of suicidality, so the present findings support this view.

5.5.5 Mediation and moderation analysis

Social problem-solving

The findings of this study were mixed in relation to testing the role of social problem-solving within the IMV model. RPS was found to be the only moderator of the defeat-entrapment relationship. This may mean that by being high in rationalising problems, which describes weighing up the pros and cons to solutions, increases the risk of suicide via increased levels of entrapment. This was an unexpected finding given that one would intuitively expect rational problem-solving to be a protective factor. A similar finding was found in relation to PPO by Chesin and Jeglic (2012) where PPO was found to predict suicidal behaviour; this suggests that it is the absence of PPO that could increase suicide risk. The findings from this study would therefore suggest that if an individual is high on RPS this could mean that they are more likely to try to rationalise their problems – the downside is that if the problems are intractable, they are more aware of being trapped which could, in turn, increase the likelihood of hopelessness.

Given that social problem-solving and other cognitive risk factors are often also operationalized as mediators it was decided to test both types of relationships. Both NPO and AS were found to mediate the defeat-entrapment relationship. Although the present study was correlational in design, the finding suggest that viewing problems as a threat and avoiding problems are associated with increased perceptions of defeat which may in turn increase the likelihood that one feels trapped As no previous studies have tested the relationship between the subscales of the SPSI-R and defeat/entrapment, it is not possible to compare these results with other studies.

Rumination

It was hypothesised that brooding rumination would moderate the defeat-entrapment relationship (hypothesis 8), however, this hypothesis was not supported. Support was found, however, for hypothesis 12 that rumination would mediate the defeat-entrapment relationship. Subsequent mediation analysis found that brooding rumination partially mediated the defeat-internal entrapment relationship. It would therefore seem that brooding rumination partially bridges the relationship between defeat and entrapment.

5.5.6 Combined effects of brooding rumination and dysfunctional social problem-solving

Brooding rumination and NPO were both found to mediate the defeat-entrapment relationship within the multiple mediator model. This shows that both high levels of brooding and NPO are likely to partially bridge the relationship between defeat and entrapment. Previous studies have shown that cognitive style can influence social problem-solving performance (Watkins & Baracaia, 2002 and Watkins & Mould, 2005) but this study highlights that, as both these variables remain significant in the final model, there seems to be different pathways to explain the defeat-entrapment relationship.

5.5.7 The role of goal adjustment on the entrapment-suicide ideation relationship

As predicted (hypothesis 10), goal reengagement moderated the defeat-internal entrapment relationship. In other words, among those who feel defeated, if they tend not to pursue new goals (when faced with unachievable goals), they are more likely to also report feeling trapped. These results are consistent with the IMV model that goal re-engagement acts as a threat to self-moderator which increases the risk of defeat leading to perceptions of entrapment. This finding is consistent with previous research, namely O'Connor et al. (2012) who also found that goal regulation acts as a proximal risk factor in suicidal

behaviour. These findings also support the theory that goal reengagement acts as a moderator within the IMV model.

In summary findings of this study and the role of mediators and moderators within the IMV model were inconclusive. It is important to note that there is some conceptual overlap with mediation and moderation, variables can be both a mediator and moderator and both can work in tandem to influence the outcome. In an attempt to simplify the conceptual overlap this study worked on the premise that mediation is when an independent variable (IV) affects the dependant variable (DV), not directly but through a third variable, the mediator. Therefore, mediation is seeking to assess whether the relationship between the IV and the DV is direct or indirect via the mediator, whereas moderation is the combined effect of two variables on another, in other words a moderating variable affects the relationship between two other variables (Baron and Kenny, 1986). It is important to highlight that there is conceptual overlap in those definitions because both variables affect the outcome of the causal relationship. The literature on the conceptual distinction of mediation and moderation has become extremely complex and it is beyond the scope of this thesis to explore this issue in depth. Notwithstanding those difficulties, another important factor to consider is the IMV model of suicidal behaviour. This model postulates one pathway and it could therefore be that this is not enough detail to aid understanding of the multiple risk factors associated with suicidal behaviour.

5.5.8 Limitations

Although this study yielded a series of noteworthy findings, there are a number of study limitations. First, the use of self-report measures exclusively in this study is a potential limitation. Self-report measures are criticised for being susceptible to the influence of social desirability (Paulhus & Vazire, 2010), where participants respond in a manner which they believe is expected of them, rather than providing an accurate representation of their experiences and feelings. An attempt was made to minimise this by emphasising that the study was anonymous and confidential. In addition, the repeated use of self-report has the problem of shared method variance (Paulhus & Vazire, 2010). Shared method variance is the possibility of finding an association between two variables because of the similarities in the way they were measured. Although it is difficult to overcome this problem when you are trying to recruit a large group of participants in a relatively short timeframe, as the

hypotheses were formulated a priori, and were theory driven, we are confident (in so far as is possible) that the findings are not explained by shared method variance.

Another limitation with this study was that this study initially recruited participants at two different time points. This was as a result of a pragmatic consideration: the initial recruitment period yielded relatively low numbers of participants so we made a minor modification to the recruitment protocol and re-advertised the study to increase the numbers. For example, we changed the order of the questions, moving the self-harm questions from the start of the questionnaire packet to mid-way through the questionnaire. Although we had no direct evidence, we reasoned that the initial ordering of questions could have been off-putting for some participants.

Another issue worth highlighting was the brevity of the follow-up period and its impact on the analyses. Although we were keen to include a prospective component to this study, within the time constraints of the PhD it was not possible to have an extensive time period between Time 1 and Time 2. The consequence of this was that the participants did not differ very much in well-being between Time 1 and Time 2, which made it difficult to detect changes in wellbeing as a function of predictors or moderators. Future research should target a longer follow-up period or time periods which are known to be high versus low in stress.

Another challenge with a study of this kind is how best to test for statistical interactions in field studies. Ideally, we would have preferred to recruit a clinical sample, as this would have helped to ensure that we recruited sufficient participants with high as well as low scores on defeat, entrapment and suicide ideation. Therefore, a limitation of the present study was that overall, the participants were healthy and reported low levels of defeat and suicide ideation. As a consequence, the absence of many of the hypothesised interactions, could simply reflect the health of our sample and the fact that the variability of scores was not sufficiently diverse to detect the interactions. Future research, therefore, should endeavour to recruit large samples from a range of 'psychological distress' backgrounds to overcome this key limitation of the present study design.

Final limitations involve firstly the number of hypothesis outlined for this study. Twelve study hypotheses could be regarded as excessive and increases the likelihood of Type 1 errors. Future research should therefore restrict the number of hypotheses within a study

design, however it is worthy of not that this study was exploratory in nature which by its nature induces many hypotheses. The final limitation of this study is the lack of power analysis to determine the required sample size. Sample sizes were restricted and unknown due to the participants primarily being recruited from a university psychology department, however the number of regression predictors had been considered and the aim was to recruit 200 participants at both time points.

5.5.9 Implications and future directions

Notwithstanding the limitations, NPO appears to be the most pernicious dimension of social problem-solving within the context of the defeat-entrapment relationship. This would mean that challenging negative conditions appears to be the most appropriate method for reducing risk of entrapment. In addition, these findings emphasise the importance of cognitive processes, specifically one's initial appraisal of a problem. It appears that this may be an area for social problem-solving interventions to prioritise. Popular interventions like Cognitive Behavioural Therapy and Mindfulness are interventions that teach skills that individuals can use which could help them to deal with negative orientations to problems when they are first encountered.

This chapter has also highlighted the importance and utility of examining the relationship between the subscales of social problem-solving and other cognitive risk factors in the prediction of suicidal behaviour. It is therefore suggested that future research should continue to examine these relationships by employing the SPSI-R, specifically with a clinical population. This study also found support for social problem-solving as threat to self moderator within the IMV model, however, the findings were mixed as both mediation and moderation was found. It is suggested that future research investigates this relationship again to clarify the role of social problem-solving within the model, under stressful conditions. A clinical population may help to elucidate the role further as mean scores of defeat and entrapment were quite low in the sample of participants in this study.

Future research would also be recommended to investigate further the relationship between the subscales of the SPSI-R and goal adjustment, especially within a clinical population. The results of this study revealed an interesting pattern of findings with goal disengagement, reengagement and the functional/dysfunctional social problem-solving subscales. There is no research to compare these results with, therefore future research is required to establish if these results can be replicated.

5.5.10 Conclusion

The most pernicious social problem-solving subscale of the SPSI-R was NPO. It was found to differentiate between individuals who report self-harm and those who do not, to predict hopelessness and mediate the defeat-entrapment relationship. In addition this study has found evidence of both moderating and mediating pathways for social problem-solving within the IMV model.

6. A mixed method design to revise the original Means End Problem-Solving (MEPS) Procedure

6.1 Abstract

Objectives

This study had two main objectives; first, to investigate the applicability of the original Means End Problem-Solving Task (MEPS) procedure scenarios for today's society and the second, to develop new scenarios, which are applicable for today's society.

Design

A convergent mixed method design was employed to meet the study objectives. The original scenarios were evaluated using quantitative analysis and the new scenarios were developed using the constant comparison mixed method and consensus groups.

Method

Focus groups (FGs) were deemed the most appropriate method in which to collect both quantitative and qualitative data. The FGs consisted of two phases with a total of 50 participants from both a student and general population sample taking part. Two consensus meetings were convened to discuss and evaluate each version of the newly developed Means End Problem-Solving Task-Revised (MEPS-R).

Results

This study yielded the development of a revised and updated version (MEPS-R) of the original MEPS scenarios.

Conclusion

This study employed a mixed method design to evaluate the original scenarios of the MEPS and to develop new scenarios resulting in the MEPS-R. Future research should evaluate the utility of the MEPS-R as an appropriate measure of social problem-solving across clinical and non-clinical samples.

6.2 Introduction and Overview

This study builds upon the systematic review (Chapter 3), which identified limitations of the existing Means End Problem-Solving Task (Platt & Spivack, 1975) and recommended that it be revised and updated. Given this aim, a mixed method design was selected as the most appropriate research approach. In summary, as the original scenarios had been developed in the 1970s, they were deemed to be less applicable for today's society. In addition, although the MEPS has been widely employed within suicide research, the scenarios that authors use are not consistent across studies (rendering comparisons difficult). In the present study, therefore, the original scenarios were evaluated and new scenarios developed. Questionnaires provided quantitative data that enabled the applicability of the old scenarios to be assessed and group exercises provided qualitative data to generate new scenarios that would be applicable for today's society. As a result, the original ten scenarios were evaluated, some were retained (but re-worded), others were dropped from the task and replaced with new scenarios. These analyses yielded a new revised Means End Problem-Solving Task (MEPS-R).

There was clear evidence from the systematic review (Chapter 3) that the Means End Problem-Solving Task (MEPS) is one of the most popular measures of social problem-solving within suicide research. Nevertheless, although there have been appropriate adaptations Marx, Williams and Claridge, (1992) and Linehan, Camper, Chiles and Shearin, (1987) to how it is delivered and scored, there has been no attempt to revise the original scenarios by making them more applicable for today's society. This chapter outlines a mixed method study which investigated the utility of the original scenarios and their applicability to today's society and also the development of new scenarios with the overarching aim of developing a revised MEPS.

6.2.1 Means End Problem-Solving Procedure (MEPS)

The means end problem-solving procedure (MEPS; Platt & Spivack, 1975) assesses an individual's problem-solving skills; in other words it taps into their problem-solving performance (see Chapter 1 & 3). This form of problem-solving measurement is concerned with the quality of solutions; it is a measure of an individual's performance and their effectiveness to solve problematic situations. Platt and Spivack (1975) designed the MEPS as an element of real-life problem-solving, as means-end thinking, which taps an 'individual's ability to orient himself to, and conceptualise a means of moving toward a goal.' The original MEPS consists of ten scenarios, which require the participant to

imagine him or herself as the protagonist in a problem situation. Participants are then asked to produce a story in which the protagonist successfully resolves the problem to achieve a specified ending. This measure is today one of the most commonly used measure of social problem-solving in psychological health research. From the review reported in Chapter three, notwithstanding the difficulties with the measure, it is clear that numerous studies using the MEPS have found poor social problem-solving to be associated with psychological distress (including depression and suicidality); thereby illustrating the value of this measure.

6.2.2 Limitations of the MEPS

Table 6.1 Examples of the original MEPS scenarios

Scenario Number	Original Scenario
Two	*Harry/Harriet loved his girlfriend very much, but they had many arguments. One day she left him. Harry wanted things to be better.* *The story ends with everything fine between him and his girlfriend.* *You begin the story with his girlfriend leaving him after an argument.*
Four	*Charlie/Chelsea had just moved in that day and did not know anyone. Charlie wanted to have friends in the neighbourhood.* *The story ends with Charlie having many good friends and feeling at home in the neighbourhood.* *You begin the story with Charlie in his room immediately after arriving in the neighbourhood.*

Although widely used, in recent decades, concern has been expressed regarding the limitations of the MEPS as a measure of problem-solving, as outlined by House and Scott (1996). These authors stated that despite many studies using this measure the results are difficult to interpret and to compare due to different methods of operationalization. They also identified the following areas of contention within the task. First, it has been argued that there is a lack of realism in the problems, which may mean that the MEPS is a test of imagination rather than how a real problem should be solved. To address this issue Marx,

et al, (1992) changed the instructions such that participants were asked to provide the ideal strategy to solve a problem. However, House and Scott (1996) suggest that this change does not go far enough. Second, the task also provides an ending to each problem, which suggests that it is like being read a story and it may seem more like the participant is providing a narrative rather than actually trying to think of ways in which the problem can be solved. This also sets a predetermined outcome, which takes away the 'real life scenario' effect. Thirdly, studies are not consistent in the use of second or third person format. The original manual presents the questions in the third person; however, some studies have used the 2nd person. These different ways of presenting the problems can have an impact on how the participant will respond to the vignettes. Thus the presentation of a vignette may mean that an individual may not recognise it as a problem, moreover, what is a problem for one individual may not be a problem for another.

Previously, some authors have adapted the MEPS questions to suit their particular study participants (Schotte & Clum, 1987; Hawton, Kingsbury, Steinhardt, Jamoss & Fagg, 1999 and Howat & Davidson, 2002); this, in itself causes difficulty when attempting to compare results across studies and populations. Furthermore, studies range from the use of six scenarios (Ivanoff, Smyth, Grochowski, Jang & Klein, 1992) to three scenarios (Linehan et al, 1987). There is also inconsistency with the adaptation of questions, where authors have changed the wording to suit the specific characteristics of their population. There are also limitations with the original scenarios as some are highly unusual but more importantly many are not meaningful in today's society, for example scenario 5 in the original MEPS was "*During the Nazi occupation a man's wife and children were viciously tortured and killed by an SS trooper, and the man swore revenge. The story ends with the man killing the SS trooper. You begin when he sees the SS trooper.*" These issues may have an impact on the reliability and validity of the findings as well as the generalizability of results across studies, therefore it is important for the MEPS to contain scenarios that can accommodate diverse populations and be applicable for today's society.

6.2.3 Present study

Although the MEPS is extensively used in suicide research, as noted above, it has its limitations in that the scenarios have not been updated to ensure they are more applicable for today's society therefore it is vital that an updated version is available for use in future research. This study aims to revise the original MEPS by firstly (i) evaluating the original

MEPS scenarios and then secondly (ii) formulating new scenarios that are applicable for today's society. These two objectives require two different types of data collection; evaluation of the original MEPS requires a questionnaire format, which produces quantitative data. Whereas the second objective, to generate new scenarios, requires multiple perspectives from participants using group discussion to yield rich qualitative data. By allowing the objectives of the study to dictate the study design we must use a pragmatic worldview in the design of this study (Creswell, 2014).

To achieve the study objectives, this study used a convergent parallel mixed method design (Creswell & Plano Clark, 2011). This type of design uses quantitative and qualitative data, which are collected in parallel and then analysed separately; the results are then integrated to reach a conclusion. Focus groups were selected as the optimal method of data collection as they were deemed to be the most useful way to collect both the qualitative and quantitative data concurrently.

6.2.4 Focus Groups

Focus groups (FGs) are a form of group interview that capitalise on communication between research participants in order to generate data (Kitzinger, 1995). This is a method that specifically uses group interaction as part of the method instead of the researcher asking each person questions in turn. In essence FGs are a useful methodology for exploring and examining what people think, and what issues are important to them without making presumptions on their behalf. There are many advantages of this method which include gathering information by listening to people's views in a non-threatening environment. Essentially, FGs allow insight into shared understanding of everyday life and the facilitator plays a much-reduced role.

Nevertheless there are limitations to such an approach, which can include the researcher having less control over the data produced (Morgan, 1988). The researcher also has to allow participants to talk to one another, ask questions and express doubts and opinions while having very little control over the interaction other than generally keeping the participants focused on the topic. This can make them difficult to control but if the FG is designed too rigidly then this can impact on the group dynamics. Practically, a FG can be difficult to assemble and it cannot be guaranteed that all participants attend when required. FGs should run until a clear pattern emerges (Kruger, 1994), meaning that the number of groups can range from four to twelve. Kitzinger (1995) emphasises that it is important to

consider the aims of the project and resources available, but also that most researchers rely on four to five groups (Kitzinger, 1994). The numbers within each group are also subject to variation with some authors recommending between six and eight participants (Kruger & Casis, 2000) whereas Wilkinson (2003) suggests that FG size can be between six to twelve. Krueger (1994) has also endorsed the use of very small or mini-focus groups of four and Morgan (1997) has posited three members. These mini-focus groups are ideal for when individuals have specialised knowledge about the subject area.

It is not just the sample size that is important within a FG but whether one chooses a homogeneous or a divergent group should also be considered. Using a group that already know each other or have a shared history (homogenous) has the advantage that it can facilitate openness. The characteristics and similar levels of understanding of a topic, are important rather than focusing on diversity (Morgan, 1988). Essentially, the common demographics will depend on the focus and specific purpose of the research (Litosseliti, 2007). What is key is that participants are chosen to represent those segments of the population who will provide the most meaningful information in relation to the project's objectives (Millford, 2012). Importantly, it is vital that the number of participants enables all within the group to express their opinion and that it is also a manageable size for one person to facilitate.

Millford (2012) states that '*by skilfully managing group dynamics it is possible to cultivate natural conversation and discussion through synergy and snowballing*'. This is the role of the facilitator. It is essential, therefore, that the facilitator should possess good communication skills, be able to gather information, listen to people's views in a non-judgemental manner, not to teach, but to facilitate an atmosphere of openness. They must ensure that they do not express their own views so as not to introduce bias, keep the conversation flowing, prevent it from being dominated by the same participants and keep the discussion focused on the issue. This, then, will foster a more natural environment where participants can influence each other.

Finally, consideration must be given to the choice of venue; Krueger and Casis (2000) state that it should be comfortable, quiet and free from distraction. Practical issues around the location for each group need to be considered to ensure that there are no barriers to attending due to the location of the FG (Millford, 2012). The environment should be

natural and non-threatening which will allow for the gathering of information and listening to people's views.

6.2.5 Focus groups and modifying the original MEPS

There is no right way to conduct a focus group (Morgan, 2008) however it must involve a pragmatic approach built upon clear understanding of the goals and outcomes of the research. Therefore, the objectives of the research project are critical to the design and analysis of data and essentially the purpose should drive the analysis (Kruger & Casis, 2000).

This study was not formally testing a hypothesis, therefore FGs were deemed the ideal method to collect the data (Millford, 2012). The objectives of this research were two-fold: firstly to evaluate the applicability of the original MEPs scenarios and; secondly to identify or develop new scenarios. The focus groups were designed to ensure that both quantitative and qualitative data were collected. Quantitative data was analysed using SPSS 21 and qualitative data were analysed using constant comparison method, this is a process by which any newly collected data is compared with previous data, it is a continuous procedure which allows for constant changes to be made with data as new data emerges.

6.2.6 Ethical Considerations

Ethical considerations for FGs are the same as for other methods employed in psychological research (Hoffman, 1991). An important consideration is to ensure that all groups are briefed about confidentiality and respect within the boundaries of each group. For the present purposes, to ensure accurate recall of the content, all participants were also briefed that the researcher would take their notes at the end of the session.

6.2.7 Statement of Objectives

FGs, as a method of scientific research, afford disciplined inquiry, which is systematic and verifiable. It does not seek to control and predict but rather it seeks to provide understanding and insight. To this end, they are well suited to the study's objectives: The first objective was to investigate the applicability of the original scenarios for today's society by using quantitative analysis and the second objective was to develop new scenarios, which are applicable for today's society. The new scenarios were developed using the constant comparison method and this study employed a convergent mixed method design.

6.3 Method

6.3.1 Recruitment

A number of recruitment methods were employed. Student participants were recruited via adverts on the University portal along with other snowballing techniques, which involved emails to students and teaching assistants advertising the study in classes. General population participants were recruited through social media and the use of other snowballing techniques, which included emailing adverts for people to pass on to others they thought might be interested. Participants received an incentive of being entered into a prize draw for a £30.00 Amazon gift voucher within each group.

6.3.2 Pilot Focus Group

A pilot group was run to test the FG design. The pilot group followed the same procedure as phase 1 FGs (section 6.3.4.1) with the only additional component being that feedback was sought at the end of the session. The feedback session involved asking the participants how they felt about each activity, if they fully understood what was being asked of them in each activity and if there was anything they felt was not clear. The only negative feedback was in terms of remembering and understanding what social problem-solving was; it was suggested that information sheets might help. Therefore, a poster was designed for the FGs and enough copies for each individual person as an aid to understanding what social problem-solving entails.

6.3.3 Participants

The sample size was determined by the numbers required for FG analysis, which was between six and eight participants in each group. This was based on the number deemed manageable by one facilitator and if some participants failed to show then the numbers would still be reasonable for the running of the FG. There was a total of 50 participants, 36 in phase 1 FGs and 14 in phase 2 FGs (see details in Figure 6.1). The groups were divided into student population and general population samples and then further divided into age categories, which were 17 – 24 years and 25 years upwards. The rationale for the student population was that many studies that employ the MEPS use a student sample. Within the time constraints of the PhD, it was not possible to recruit a clinical sample for this study therefore a general population sample was deemed to be an appropriate sample.

Phase 1 Focus groups (N=36) Development of Version 1 MEPS-R

FG 1- Pilot: N= 7   FG 2- Student: N= 7   FG 3- Student N= 6

FG 4 - Gen Pop N= 8   FG 5- Gen Pop N= 8

QUANTITATIVE DATA   QUALITATIVE DATA

QUANTITATIVE ANALYSIS   QUALITATIVE ANALYSIS

Quantitative & Qualitative Results Integrated

Version 1 MEPS-R

Consensus MTG 1

Version 2 MEPS-R

Phase 2 Focus groups (N=14)

FG 6 -Gen pop N = 7   FG 7- Student N= 3   FG- 8 Student N= 4

QUANTITATIVE DATA   QUALITATIVE DATA

QUANTITATIVE ANALYSIS

Consensus MTG 2

Version 3 MEPS-R

FG: Focus Group sequential number; Gen Pop: general population and MTG: meeting

Figure 6.1 Procedural diagram for revising the original MEPS

6.3.3.1 Phase 1 Focus Group Participants

Phase 1 consisted of five FGs, all of which were homogenous groups. As the pilot FG had resulted in no changes to the study design it is included in all analyses. There was a total of 36 participants with an age range of 16 – 54 years and a mean age of 28.67 years (SD = 11.71). There were 22 females, age range 16 – 50 years and a mean age of 29.82 years (SD = 11.53) and 14 males, range 16 – 54 years with a mean age of 26.86 years (SD =12.2).

FG 1 was the pilot group and consisted of seven females, five of whom were employed within a university and two were postgraduate students. All the participants knew each other and knew the facilitator. The age range was 23 – 29 years with a mean age of 26.92 years (SD =2.1).

FG 2 consisted of seven psychology students (four females and three males), age range 18 – 21 years and a mean of 19.71 years (SD =1.25). Some of the participants knew each other, this was considered a homogenous group because they are of a similar age and all are undertaking the same degree so there was a level of familiarity with the group. None of the participants in this group knew the facilitator.

FG 3 was the second student group (six females and one male) with an age range of 28 years to 50 years with a mean age of 41.33 years (SD =7.47). This group of participants knew each other to varying degrees.

FG 4 was a general population group with an age range of 16 years to 19 years and a mean age of 17.5 years (SD =1.31) consisting of five males and three females. This group all knew each other well and some knew the facilitator. Some of the participants in this group were still at school, some were at college and some were working. All the participants in this group lived at home with their parents.

FG 5 was also a homogenous group which consisted of eight general population participants with an age range of 27 – 54 years and a mean age of 40.25 years (SD =10.94), with three males and five females. With the exception of one participant, they all knew the facilitator and they were in full time employment. All participants were homeowners.

6.3.3.2 Phase 2 Focus Groups participants

For phase two there was a total of 14 participants, with an age range of 19-54 years and a mean age of 33.93 years (SD =13.11) with 3 males, age range of 19-54 years, mean age of 38 years (SD =17.6) and 11 females with an age range of 19-54 years and a mean age of 32.82 years (SD =12.6). There were three separate groups in this phase of the study and all were homogenous groups.

FG 6 consisted of seven general population participants with an age range of 29 years to 54 years, mean age of 44.57 years (SD =8.66) and it consisted of five females and two males. All the participants knew the facilitator, but most of the participants did not know each other.

FG 7 was a student population with an age range from 20 years to 35 years (mean age 27 years (SD =7.55). It consisted of three females. Only one of this group knew the facilitator and all of the participants knew each other.

FG 8 was a student population and ages ranged from 19 years to 54 years with a mean age of 23 years (SD =1.92). This group consisted of one male and three females, none of the participants knew the facilitator and none of them knew each other.

6.3.4 Data Types

Within phase one FGs, quantitative data were collected via questionnaires that were completed by all participants (see Appendix 15). Qualitative data were collected via a group discussion wherein each group of participants was tasked with agreeing six social problem-solving scenarios (see Appendix 17), this data was written down by the participants and then typed up by the researcher. Phase 2 FGs involved the use of quantitative data collection whereby each participant completed a questionnaire. Qualitative data were recorded by the facilitator using discussion about the wording of each new scenario, comments were recorded by the researcher against each scenario. The following sections describe the procedural details for both phases of the FG administration.

6.3.4.1 Focus group design: Phase 1

The first phase of FGs was designed to last about two hours in duration and it entailed four different activities, which were a mixture of working in pairs, whole group work and working individually (Table 6.2). The four different activities were each designed for a specific purpose. Activity 1 was an individual activity, whereby participants responded to

questions regarding the original MEPS scenarios; this provided the quantitative data. The second activity was designed to build confidence in the group and encourage the participants to share their views, and to show that different views are good. A further aim of this activity was to help enhance their understanding and thus their confidence about what social problem-solving entails. The third activity was conducted in pairs, this involved identifying six scenarios that each pair thought would be appropriate for today's society. During this activity participants could move away from the confines of the group, participants were also invited to help themselves to soft drinks/refreshments. The aim of this activity was to enable participants to start thinking about new scenarios they would consider applicable for today's society. The fourth and final activity was the key part of the FG. Participants, as a group, were required to produce a list of six scenarios that the whole group agreed on which were most applicable for today's society using the paired lists as a tool (See Appendix 16 and 17). This phase resulted in version 1 of the MEPS-R.

Table 6.2: Phase 1 Focus Group Design

Activity/ Duration	Description
5 minutes	Introduction; information and consent forms
5 minutes	Icebreaker
1. 10 minutes	Individual Questionnaire (Quantitative data collection)
2. 10 minutes	Group discussion
3. 30 minutes	Paired exercise
4. 60 minutes	Group discussion (Qualitative data collection)
5 minutes	Debriefing

6.3.4.2 Focus group design: Phase 2

The second phase of the FGs was designed to last for about one hour and entailed two activities (see Table 6.3). After introductions and a briefing on what would happen during the focus group, each individual was given a questionnaire to complete (see Appendix 18). The structure of this questionnaire was the same as in phase 1, the only difference being that the scenarios had been modified in light of the findings from phase 1(version 2 MEPS-R).

Table 6.3: Phase 2 Focus Group Design

Activity/Duration	Description
5 minutes	Introduction; information and consent forms
5 minutes	Icebreaker
1. 10 minutes	Individual questionnaire (quantitative data collection)
2. 30 minutes	Discussion on wording of each scenarios
5 minutes	Debriefing

6.3.4.3 Facilitator and venues

The researcher acted as the facilitator for all of the groups. The researcher has been trained in facilitation skills and has considerable experience facilitating groups. The facilitator's role was flexible throughout each group and was responsive to the different dynamics of each group. Essentially the facilitator ensured that the discussions did not stray too far off the subject, kept an eye on time and ensured that all participants felt that their voice was being heard. In a similar vein the role also required facilitation of the group discussion to ensure that not just the strong voices were heard but also that all individuals felt that their contribution had been listened to by the group. The facilitator reflected back to the group and summarised conversations to enable them to keep focused. At the same time she remained impartial, and did not lead any of the groups down any specific area of discussion.

The student FGs took place in a university common room. The general population FGs were held in various venues; the key criteria for venue selection was ease of access for all and where people would feel most comfortable. Tea, coffee, cold drinks and snacks were made available at the FGs.

6.3.5 Focus Group Procedure

Ethical approval was gained from the University of Stirling's ethics department before commencement of the FGs. As there were no significant ethical implications that required declaring to the committee, a basic ethics information form was completed together with a protocol of the FGs. At the start of all groups the facilitator briefed the groups on what a FG was and answered any questions. Participants were informed about confidentiality and invited to read the information sheet and then sign the consent form. Next, everyone took part in an ice-breaker activity; this was tailored to meet the needs of each particular group. Participants were given a briefing on what was required before each activity thus allowing participants to clarify anything that was unclear.

6.3.5.1 Phase 1 Focus group procedure

Phase 1 FGs consisted of four activities. Activity 1 consisted of each individual completing a questionnaire (Appendix 14); this was the quantitative data collection component. The questionnaire consisted of the original ten scenarios from Platt and Spivack's (1975) Means End Problem-solving task. After each scenario there were two questions (the same for each scenario). The first question asked participants to rate 'how

easy or difficult is it for you to imagine being in this situation?' The second question then asked 'How applicable is the above scenario in today's society?' Each of the two scenarios was scored on a five point Likert-type scale with 1 = very difficult or very applicable and 5 = very easy, very applicable. Participants were required to circle their response to each question.

The second activity was a group activity which the facilitator led on and used a flip chart board to collate responses. The facilitator asked the participants to focus on the second question, which asked 'how applicable is this scenario in today's society?' Using a tally system, the facilitator then went through each scenarios and asked for example, 'how many people scored four on the scale for scenario 1'. This was repeated until all responses were recorded. The participants were being asked to share their scoring with the rest of the group, which was collated by the researcher on a flipchart. Participants were also encouraged to comment on the individual differences in responses. It was further highlighted to the participants that there were no right or wrong answers.

The third activity was carried out in pairs. Participants were informed that they had about 30 minutes to discuss scenarios that they felt would be suitable social problem-solving scenarios for today's society. Each pair was supplied with a sheet of A4 paper, and they were informed that they were required to list six scenarios between them (see Appendix 15).

The final activity involved the whole group and took approximately 60 minutes. Each pair was invited to read through their six social problem-solving scenarios, during which the facilitator recorded notes on a flip-chart. After which, each group was required to discuss the scenarios and agree which were the best. At the end of the session, each FG was asked to verify what was agreed (see Appendix 17).

6.3.5.2 Phase 2 FG procedure

The first activity involved each member of the group individually completing a questionnaire (Appendix 4). The questionnaire consisted of ten scenarios from the first round of FGs (version 2 MEPS-R). After each scenario there were two questions (the same for each scenario). The first question asked participants to rate 'how easy or difficult is it for you to imagine being in this situation? The second question then asked 'How applicable is the above scenario in today's society?' Each of the two questions was scored on a five point Likert-type scale with 1 = very difficult and 5 = very easy.

The second activity involved a group discussion. Participants were guided through each scenario in turn and asked what they thought about the wording of the scenario and if there was anything they struggled with or would change. The facilitator took notes during this session.

6.3.6 Overview of the Procedure

The first stage in this study was phase 1 of the FGs, which consisted of five different FG all with the same format which yielded both collected quantitative and qualitative data. The data were analysed separately and then integrated. This analysis led to the development of version 1 of the revised MEPS (MEPS-R). The next stage involved a consensus meeting where the results and new scenario themes were discussed, this resulted in the second version of the MEPS-R. The second phase of FGs involved testing version 2 of the MEPS-R using the same method as had been used to analyse the original MEPS. This, along with a discussion about the wording of each of the scenarios was conducted in this phase of FGs. The quantitative data were then analysed and a second consensus meeting (this consisted of the researcher and two supervisors) convened to discuss the results regarding the wording of the scenarios, which resulted in version 3 of the MEPS-R.

6.3.7 Data analysis

Quantitative data were analysed using SPSS 21 where descriptive statistics were used to generate the percentages of responses for each of the scenarios. Data from the questionnaires were collapsed, for example, scores on the Likert-type scale for responses 1 (very difficult) and 2 (difficult) were collapsed as participants were agreeing to the statement. The same procedure was employed for 4 (easy) and 5 (very easy). Qualitative analysis was conducted using steps two and three of constant comparative method (see section 6.4.2) to analyse the group scenarios from the FGs. As this study was a mixed method convergent design, quantitative and qualitative data were analysed separately and then integrated together.

6.4 Results

6.4.1 Quantitative analysis investigating the applicability of the original MEPs scenarios

All 36 individual responses (phase 1 FG participants) were inputted into SPSS to analyse the responses to the two questions concerning each of the original MEPS scenarios. For ease of presentation, the questions are shortened to 'self' and 'society' in Table 6.3. As noted earlier, percentages were calculated by collapsing the data for responses 1 and 2, in some instances there were no scores of '1' recorded at all and in those instances only the percentage for the scores on '2' were recorded. The same method was applied to the responses to each scenario where '4' and '5' were recorded as a response. Following discussion, the following threshold for accepting/rejecting a scenario was agreed: For a scenario to be accepted, 50% or more of the responses on each of the questions had to be 4 (easy or applicable) or 5 (very easy or very applicable) or 50% or above for statements responding 1 and 2. Responses of 'not sure' were not taken into consideration.

Table 6.3 shows that scenarios 2 (72.2% & 91.7%), 3 (86.1% & 86.1), 4 (66.7% & 55.5%), 8 (61.1% & 69.5%) and 10 (72.2% & 80.6%) were deemed applicable in that all the scores were equal to or over 50% meaning that these scenarios were viewed as being applicable for today's society and that one can very easily imagine oneself having to deal with that situation. The original scenarios 1, 5, 6, 7 and 9 were dropped because they did not meet the criteria at this stage of analysis to be included in the revised MEPS.

Table 6.4: Individual responses to questions regarding the ten original MEPS scenarios

Question/Scenario	Responses	Percentage	Responses	Percentage
1.Alex was listening to the people speaking at a meeting about how to make things better in her neighbourhood. She wanted to say something important and have a chance to be leader too.				
Self	1 & 2	33.4	4 & 5	47.2
Society	1 & 2	30.6	4 & 5	33.4
2. Heather loved her boyfriend very much, but they had many arguments. One day he left her. Heather wanted things to be better.				
Self	2	5.6	4 & 5	**72.2**
Society	2	2.8	4 & 5	**91.7**
3. Paula came home after shopping and found that she had lost her watch. She was very upset about it.				
Self	1 & 2	8.4	4 & 5	**86.1**
Society	2	5.6	4 & 5	**86.1**
4. Charlie had just moved in that day and did not know anyone. Charlie wanted to have friends in the neighbourhood.				
Self	2	11.1	4 & 5	**66.7**
Society	2	16.7	4 & 5	**55.5**
5. During the Nazi occupation a man's wife and children were viciously tortured and killed by an SS trooper, and the man swore revenge.				
Self	1 & 2	77.8	4 & 5	13.9
Society	1 & 2	77.7	4 & 5	11.2
6. One day Alison saw a gorgeous guy she had never seen before while eating in a restaurant. She was immediately attracted to him.				
Self	1 & 2	27.8	4 & 5	55.5
Society	1 & 2	25	4 & 5	47.2
7. Anna needed money badly. The story begins one day when she notices a valuable diamond in a shop window. Anna decides to steal it.				
Self	1 & 2	77.7	4 & 5	11.2
Society	1 & 2	38.9	4 & 5	44.5
8. Janice noticed that her friends seemed to be avoiding her. Janice wanted to have friends and be liked				
Self	2	16.7	4 & 5	**61.1**
Society	2	2.8	4 & 5	**69.5**
9. One day Gina was standing around with some other people when one of them said something very nasty to her. Gina got very mad, so mad she decided to get even with the other person.				
Self	1 & 2	2.8	4 & 5	27.7
Society	2	36.2	4 & 5	72.2
10. Jody is having trouble getting along with her boss at work. Jody is very unhappy about this.				
Self	1 & 2	11.2	4 & 5	**72.2**
Society	1 & 2	5.6	4 & 5	**80.6**

Self: How easy or difficult is it for you to imagine being in this situation, with 1 being very difficult and 5 being very easy; **Society:** How applicable is the above scenario in today's society with 1 being not at all applicable and 5 being very applicable.

6.4.2 Qualitative analysis of phase 1 focus groups

To analyse the group scenarios, the constant comparison method (Onwuegbuzie, Dickinson, Leech and Zoran, 2009), which is an essentialist framework was employed. The construct comparison method has three stages, starting with 'open coding', whereby the data are chunked into small units and the researcher attaches a code to each of the units. In the present study this first step was redundant as the scenarios are already classed as the small units, therefore there was no need to develop a coding system. Analysis began at the second stage, 'axial coding', which is when the data are grouped into a category. Then the final stage, 'selective' coding, is carried out which involves the development of themes to express the content of the groups.

6.4.2.1 Axial Coding

Each of the 31 scenarios generated by the groups (six from each group apart from one group which had a male/female disagreement so seven scenarios were provided by this group, i.e., 6 x 4 groups + 1 x 7 = 31) was classed as chunked data (which is the first step of constant comparison method) and then a code was applied. For example, 'parents separating' was coded as 'RF' (see Table 6.5), which is 'problems with people in your life'. The following tables show all of the scenarios with the category codes attached to the scenarios.

Table 6.5: Group 1 scenarios and categories

Gp 1	Scenarios	Coding
1.1	Romantic relationship and how to meet someone new	RP
1.2	New Job and how to solve problem with colleague	RW
1.3	Lost phone/purse	PP
1.4	Financial problems re paying rent or mortgage	F
1.5	Making a difference to something that you care about.	C
1.6	Having to support someone, go to doctors or being bullied.	RF

RP= relationship problem; RW- relationship work; PP – practical problem; F – financial problem; C – community and RF- relationship family/friend.

Table 6.6: Group 2 scenarios and categories

Gp 2	Scenarios	Coding
2.1	Addiction to technology	PP
2.2	Sexuality issues	PP
2.3	Unemployment	E
2.4	Student issues, no money to go out, peer pressure, getting more debt	F
2.5	Social networking relationships/friends	SN
2.6	Homelessness (male participants did not agree	H
2.7	Parents separating	RF

PP – practical problem; E – employment; F – financial; SN – social networking; H – housing and RF-relationship family/friends.

Table 6.7: Group 3 scenarios and categories

Gp 3	Scenarios	Coding
3.1	Brian has just graduated and is finding it difficult to get a full time job. He is worried about paying the rent now that his student loan payment has stopped.	F
3.2	Teenage girl shares intimate photo with boyfriend, they split up, he shares the image, you know her, what do you do?	SN
3.3	Employer, without changing the terms and conditions pressurises employee to stay late to complete increased workload whilst at the same time reminding them they are lucky to have a job in this economic crisis.	WK
3.4	You notice items have gone missing from an elderly relatives home, the only other people entering the house are the carers.	SP
3.5	You hear a neighbour screaming and lots of noise from next door. This is not the first time, you've had concerns about your neighbour. Do you phone the police or intervene yourself or do nothing?	SP
3.6	You check the back balance on-line and find £250 as been taken from a paypal transaction that you have not made.	F

F - Financial; SN – social networking; WK – work and SP – supporting someone

Table 6.8: Group 4 scenarios and categories

Gp4	Scenarios	Coding
4.1	Being scared about going to the doctor about a recurring problem.	PP
4.2	Being too nice to say no and taken out of your comfort zone.	RF
4.3	Alice did not like his mums boyfriend as they never spoke	RF
4.4	Ryan fell out with Daniel as Daniel hangs out with his girlfriend and Daniel never answers his calls	RF
4.5	Newton has been homeless for 3 months and has the option to go home or get a place in a shelter.	HSE
4.6	Sally is emotional because her boyfriend hits her and she does not want to leave the house.	RP

PP – Practical problem; RF= relationship family/friend; HSE- housing and RP= relationship partner

Table 6.9: Group 5 scenarios and categories

Gp5	Scenarios	Coding
5.1	Social networking. The impact consequences; confidentiality and or communication	SN
5.2	Employment. Opportunities – lack off; career options limited; moving and maintaining job.	WK
5.3	Friends – worried about addictions of responsible use (drugs or alcohol.	SP
5.4	Money. Financial mismanagement; income insecurity; employment reduced salary; cost of living and fraud.	F
5.5	Citizenship/respect – dealing with lack of respect for property or doing the right thing.	C
5.6	Elderly care responsibilities or complex family relationships.	SP

SN=social networking; WK= work; SP=supporting someone; F=financial and C=community

The final step in the process was selective coding where the categories are grouped into themes. The themes were used to help identify new scenarios that were required to bring the total up to ten as five had been retained from the original scenarios.

6.4.2.2 Selective coding

A total of five themes were identified from the categories (see Table 6.10). Themes were identified by placing coding categories into groupings of similar issues. These were: work-related problems; relationship problems; worry in relation to self; worry in relation to others and practical problems. The two most common themes were: relationship problems and practical problems.

The themes were identified by grouping together scenarios that had commonalities (in terms of topic or meaning). For example, employment and career issues were both classed as work-related problems. Relationship problems encompassed all types of relationships whether with a friend, partner or work colleague. A theme around worry in relation to self emerged as a theme focused on worrying about others (the latter involved categories related to supporting someone else or not being sure how to support someone who had a problem). Practical problems were identified as an independent theme because they did not have an interpersonal component; essentially they involved an individual attempting to solve problems on their own.

Table 6.10: Themes identified from categories

Themes	Group/scenario
Work related problems	
Employment	2.3
Career Issues	3.3; 5.2
Relationship problems	
With friends	1.6; 2.7; 4.2; 4.3; 4.4
Partner	1.1; 4.6
Work colleague	1.2
Via social networking	2.5; 3.2; 5.1
Worry in relation to self	
Health	4.1
Addiction	2.1
Sexuality	2.2
Worry in relation to others	
Elderly relatives	3.4; 5.6
Neighbours	3.5
Friends with problems	5.3
Practical problems	
Financial	1.4; 2.4; 3.1; 3.6; 5.4
Housing	2.6; 4.5
Lose of purse or watch	1.3
Community problems	1.5; 5.5

The numbers in the column labelled group/scenario are taken from
Tables 6.2 to 6.6.

6.4.3 Integrating quantitative and qualitative data

The following table (Table 6.11) shows the integration of the results from the quantitative

and qualitative analysis.

Table 6.11 Integration of original and new scenarios (version 1 MEPS-R)

New	Original/new	Themes	Remit of scenario
1	Original (2)	Relationship problems	Problems with partner
2	Original (3)	Practical problem	Lost item
3	Original (4)	Practical problem	New to area
4	Original (8)	Relationship problem	Problem with friend
5	Original (10)	Work	Trouble with boss
6	New	Practical problem	Paying the bills
7	New	Relationship problems	Social networking
8	New	Worried about another	Worried about friend
9	New	Relationship problem	Friend letting you down
10	New	Worry about self	Worry what friend thinks

The number in brackets refers to the scenario number in the original version

Table 6.11 shows the themes for the ten revised scenarios, which comprised the first version of the revised MEPS (Version 1 MEPS-R). The new themes (scenario 6 to 10) were determined by table 6.7, which shows the most popular themes/remit of the scenario identified by all phase 1 FGs. Scenarios six to ten were therefore identified by popularity with all of the FGs. The themes and remit of each scenario was then evaluated at the first consensus meeting. The aim of the consensus meeting was to review the results and discuss the formulation of the new scenarios.

6.4.4. Consensus meeting 1

The aim of the first consensus meeting was to agree ten new scenarios based on the data collected from phase 1 FGs. At the consensus meeting, the wording of the original scenarios (2,3,4,8,10) was closely inspected to determine whether any of the wording of the scenarios required updating, to reflect contemporary language use. The wording of the five new scenarios was also discussed in light of the formal and informal feedback received by the researcher from FG members. In keeping with Platt and Spivack's (1975) original format the consensus group devised five new scenarios based on the themes identified. As a result the consensus meeting the following ten scenarios were agreed for testing in the second round of FG.

The following scenarios (Table 6.12) are Version 2 of new and revised scenarios, which were a result of investigating the applicability of the original MEPS scenarios and new scenarios developed from the FGs.

Table 6.12 Version 2 of the MEPS-R

Scenario 1	You love your partner very much, but recently you have been having a lot of arguments and you want to do something to make things better between you both. *The story ends with things being better between you*
Scenario 2	You come home after being out and realise that you have lost your wallet/purse or mobile. *The story ends with you finding your wallet/purse or mobile.*
Scenario 3	You have just moved home and want to meet new people in the area. *The story ends with you knowing new people in the area*
Scenario 4	You notice that your friends seem to be avoiding you and you want things to be how they were previously. *The story ends with all being well between you and your friends again.*
Scenario 5	You are having problems getting along with a colleague at work. *The story ends with you and your colleague getting along well.*
Scenario 6	You realise that money is tight this month and you are going to have problems paying an important bill. *The story ends with you being able to pay the bill.*
Scenario 7	You and a friend have been messaging by text and you are upset by something they have written. *The story ends with you being no longer upset*
Scenario 8	You are worried about the health of a close friend or relative and you are not sure what to do. *The story ends with you no longer being worried about your close friend/relative's health*
Scenario 9	A friend has been repeatedly letting you down recently. *The story ends with you no longer feeling let down*
Scenario 10	You have been really worried about what other people think of you. *The story ends with you feeling less worried about what others think of you*

6.4.5 Summary

The first round of FGs enabled the original MEPS scenarios to be analysed in terms of their applicability for today's society. Using quantitative analysis it was found that only five of the original 10 scenarios were applicable for today's society. A constant comparison method was employed to generate new scenarios from the scenarios suggested in the FGs. The quantitative and qualitative data from the FGs were integrated to yield the ten revised scenarios for the first version of the revised MEPS. A consensus meeting was then held which led to a further revision of the MEPS: Version 2 MEPS-R.

6.4.6 Quantitative analysis of the Second Round of Focus Groups

The analytic procedure for the second round of focus groups was the same as that employed in the first round of the focus groups (see section 6.3.7)

Table 6.13 shows the responses from the individual questionnaires regarding the revised ten scenarios (Version 2 MEPS-R). Responses are based on the Likert-type scale with 1 and 2 being 'very difficult to relate to' and 4 and 5 being 'very easy to relate to' (in terms of self)'. As stated previously the criteria for scenarios being acceptable was for responses to be equal to or greater than 50% (Table 6.13). The table shows that all scenarios received responses above 50% for both questions apart from scenario 9 which received a lower score of 50% which is still deemed appropriate. Due to this result all ten-revised scenarios were deemed as applicable for today's society.

Table 6.13: Individual responses to questions regarding revised scenarios

Question/Scenario	Responses	Percentage	Responses	Percentage
1. You love your partner very much, but recently you have been having a lot of arguments and you want to do something to make things better between you both				
Self	1	7.1	4 & 5	92.9
Society	0	0	4 & 5	85.7
2. You come home after being out and realise that you have lost your wallet/purse or mobile.				
Self	1 & 2	21.4	4 & 5	78.6
Society	0	0	4 & 5	100
3. You have just moved home and want to meet new people in the area.				
Self	2	7.1	4 & 5	71.5
Society	2	7.1	4 & 5	71.5
4. You notice that your friends seem to be avoiding you and you want things to be how they were previously				
Self	1 & 2	28.6	4 & 5	57.2
Society	2	7.1	4 & 5	71.4
5. You are having problems getting along with a colleague at work.				
Self	0	0	4 & 5	85.7
Society	0	0	4 & 5	85.7
6. You realise that money is tight this month and you are going to have problems paying an important bill.				
Self	1 & 2	28.5	4 & 5	64.3
Society	0	0	4 & 5	92.9
7. You and a friend have been messaging by text and you are upset by something they have written.				
Self	1 & 2	21.4	4 & 5	71.5
Society	0	0	4 & 5	100
8. You are worried about the health of a close friend or relative and you are not sure what to do.				
Self	1 & 2	21.4	4 & 5	71.5
Society	2	7.1	4 & 5	85.7
9. A friend has been repeatedly letting you down recently.				
Self	1 & 2	35.7	4 & 5	50
Society	2	7.1	4 & 5	71.4
10. You have been really worried about what other people think of you.				
Self	1 & 2	42.8	4 & 5	57.1
Society	2	7.1	4 & 5	78.6

Self: How easy or difficult is it for you to imagine being in this situation, with 1 being very difficult and 5 being very easy; **Society:** How applicable is the above scenario in today's society with 1 being not at all applicable and 5 being very applicable.

6.4.7 Consensus meeting 2

The second consensus meeting involved a discussion of the analysis from the second round of focus groups along with the comments from the FG members regarding the wording of scenarios.

Each scenario was discussed in relation to the wording and the following changes were made. Comments on specific wording from FG members are <u>underlined</u>, changes are written in *italics*. There were no changes made to scenarios 2 and 9.

Scenario 1 was "<u>You love your partner very much</u>, but recently you have been having a lot of arguments and you want to do something to make things better between you both. The story ends with things being better between you."

It was agreed that by deleting "<u>you love your partner very much</u>" and replacing this with "*you and your partner*" the new scenario would be more generalizable. Following this changes, the revised scenario is " You and your partner have recently been having a lot of arguments and you want to do something to make things better between you both. The story ends with you arguing less."

Scenario 3 was "You have just moved <u>home</u> and want to meet new people in the area. The story ends with you <u>knowing</u> new people in the area."
It was agreed that sometimes some people may view home as different to where they live therefore "home" was removed. The word knowing was also changed in the solution as participants felt that this was ambiguous. It was changed to *meeting*.

Scenario 4 was " You notice that <u>your friends</u> seem to be avoiding you and you want things to be how they were previously. The story ends with all being well between you and your<u> friends </u>again."

It was agreed it would be easier for participants to imagine this scenario if it was changed to "*a friend"* seems to be avoiding you and you want things to be how they were previously."

Scenario 5 only required changes made to the ending. Participants had voiced their concern that sometimes the reality is just to get on better so the ending <u>getting along well</u> was changed to *getting along better*.

Scenario 6 was changed considerably from the original scenario which was "<u>You realise that</u> money is tight this month <u>and you are going to have problems paying an important bill.</u> The story ends with you being able to <u>pay the bill.</u>"

Participants commented that although they recognised this as a problem they struggled with the wording. As a result it was agreed to use a more universal statement to describe this financial problem as follows. "Money is *going* to be tight this month, *as you have received an unexpected bill.* The story ends with you being able to pay *all your bills.*"

Participants felt that scenario 7 was too prescriptive "You and a friend have been <u>messaging by text</u> and you are upset by something they have written. The story ends with you being no longer upset." Given the advent of social media, participants felt that the scenario should be changed to "You and a friend have been *messaging or texting* and you are upset by something that they have written. The story ends with you no longer being upset."

Scenario 8 was about the health of someone close to you, participants agreed that they thought this was a reasonable problem to imagine but stated that they struggled with the ending. Therefore, the ending was changed from "<u>no longer being worried</u>" to "*being less worried*".

Some participants felt that scenario 10 was not necessarily something they would consider a problem although agreed it is something people worry about. Participants stated that if the wording could be made more specific this might help the scenario. Therefore, the scenario was changed from "You have been really worried about what <u>other people</u> think of you**.** The story ends with you feeling less worried about what <u>others</u> think of you." to "You have been really worried about what *a friend* thinks about you. The story ends with you feeling less worried about what *your friend* thinks about you."

Table 6.14 Version 3 MEPS-R

Scenario 1	You and your partner have recently been having a lot of arguments and you want to do something to make things better between you both. The story ends with you arguing less.
Scenario 2	You come home after being out and realise that you have lost your wallet/purse or mobile. The story ends with you finding your wallet/purse or mobile.
Scenario 3	You have just moved and want to meet new people in the area. The story ends with you meeting new people in the area.
Scenario 4	You notice that a friend seems to be avoiding you and you want things to be how they were previously. The story ends with all being well between you and your friend again.
Scenario 5	You are having problems getting along with a colleague at work The story ends with you and your colleague getting along better.
Scenario 6	Money is going to be tight this month, as you have received an unexpected bill. The story ends with you being able to pay all your bills.
Scenario 7	You and a friend have been messaging or texting and you are upset by something that they have written. The story ends with you no longer being upset.
Scenario 8	You are worried about the health of a close friend or relative and you are not sure what to do. The story ends with you being less worried about your close friend/relative's health.
Scenario 9	Recently, a friend has been repeatedly letting you down. The story ends with you no longer feeling let down.
Scenario 10	You have been really worried about what a friend thinks about you. The story ends with you feeling less worried about what your friend thinks about you.

6.4.8 Summary

Following a second round of focus groups the second version of the revised scenarios was analysed quantitatively. This showed that the ten revised scenarios were deemed applicable for today's society. The focus groups also examined the wording of the scenarios which were reviewed at a second consensus meeting. These comments were discussed and certain words were changed on all but two scenarios resulting in version 3 of the revised MEPS, which was the final version of the MEPS-R.

6.5 Discussion

The aim of this study was to update the original MEPS (Platt & Spivack, 1975) scenarios and this was achieved through a series of focus groups. In addition consensus meetings and both quantitative and qualitative data guided the development of the revised scenarios, which resulted in the development of the MEPS-R.

As stated above, the key components in the process to update the original MEPS scenarios involved FGs. There were two phases to running the focus group and after each phase a consensus meeting was convened to review the results and the feedback from the groups. Both quantitative and qualitative data were collected from the FGs, which enabled an evaluation of the original MEPS in phase 1 of the FGs and the evaluation of the first version of the MEPS-R in phase two FGs. Qualitative analysis was used to identify themes, which formed the basis for the development of the new scenarios. Merging the quantitative and qualitative data from the first phase of the FGs meant that five scenarios were retained from the original MEPS and five new scenarios were devised from the qualitative data. The five original scenarios were further amended to change the wording to make each scenario more applicable for today's society.

A strength of using FGs was that they enabled participants to give their own views and to use discussions to help consider the views of others and to reach group consensus. The FGs facilitated an environment where participants were encourage to explore and discuss different areas of life which enabled a diverse range of responses in generating new scenarios. The design of the FGs in the first phase enabled participants to become knowledgeable surrounding the subject area with a stepped process to build confidence in sharing individual views within a group setting.

It is difficult to evaluate this process in relation to other studies as, to the author's knowledge, studies that have adapted the scenarios have not reported a process, they have simply stated that the scenarios were adapted. Therefore, there was no previous method with which to follow or use as a guide. This, in itself, could be deemed as a limitation to the present study.

6.5.1 Limitations

This study did have a number of limitations, firstly concerning the facilitator of the FGs. The researcher of the study was also the facilitator of the FGs; ideally an impartial individual would have been better to facilitate the focus groups. This would have ensured that that there was no bias with the facilitator leading the groups in any way. Secondly, in relation to the FGs the samples were drawn from student and general populations.

Although a student population is widely used in research employing the MEPS the main population in most studies is a clinical population. By using general population samples it may well be the case that scenarios being identified by that population are not those that would be identified by clinical populations. Clinical populations may well identify other issues that they would class as everyday social problems. A recent review (Townsend, 2014) highlighted that social problems-regularly cited by individuals who report deliberate self-harm involved relationship issues with partners, families and friends, in other words inter-personal problems. The research literature highlights the importance of social support as a protective factor for psychological distress, therefore it seems reasonable to postulate that if this study had included a clinical sample then interpersonal problems would have featured highly in participant responses.

A final limitation regarding the FGs was the number of participants and number of groups specifically in the second phase. There were three groups consisting of seven, three and four participants. After the first group of seven participants the researcher realised that this number was too large to achieve the aims. This round of focus groups really required lower numbers to encourage more discussion about the scenarios as the discussion was about the specific wording of the scenarios. The other two groups consisted of three and four participants but due to the small numbers it may have enhanced the finding by running some more groups.

It is also important to consider how the quantitative data generated from the questionnaires (which asked participants their views on the scenarios) were analysed. As there is no consensus in the literature about the precise cut-off (percentage) which should have been used for deciding whether a scenario should be included in the revised measure, we went with the pragmatic solution of 50%. This recognised that no scenario is going to be universally endorsed but that going with a 50% cut-off, the scenarios would be sufficiently applicable across a wide sample. However, it could be argued that this cut off point was decided arbitrarily and that a higher or lower cut of point could have been used. Notwithstanding the abovementioned limitations, the next step in the development of this measure is for future research to test the utility of this revised measure.

6.5.2 Conclusion

This study has responded to limitations of the original MEPS by revising the original scenarios and creating a new version, the MEPS-R that is more applicable for today's society. The MEPS-R provides researchers with updated scenarios that can be used across the lifespan and with different populations. The next step in the development of this revised measure is to test the use of this measure in a research study. This is the focus of the next chapter.

Chapter seven: Testing the Means End Problem-Solving Task-Revised

7.1 Abstract

Aims

The aims of this study were (i) to test the revised Means End Problem-Solving Task (MEPS-R), a measure of social problem-solving, by, investigating the latter's relationship with established correlates of wellbeing and self-report measures of social problem-solving and, (ii) to test the measure on-line for the first time.

Method

Two separate studies were employed to test the MEPS-R. In study 1, one-to-one interviews (n=40) were conducted in which participants completed a battery of measures together with the ten social problem-solving scenarios. The second study employed an on-line method in which participants (n=247) were directed to a remote access website to complete the same battery of questionnaires as in study 1 and the ten social problem-scenarios by typing in their responses.

Results

Internal consistency for the new MEPS-R was found to be good across both studies. However, neither study found any significant correlations between the MEPS-R responses and psychological distress variables, however there were strong correlations between the two MEPS-R scores (relevant means generated and effectiveness).

Conclusion

This study found good internal consistency with the MEPS-R and inter-rater reliability was deemed good. No significant correlations between any other study variables were found except between the scores on the MEPS-R (relevant mean scores and effectiveness scores). It is possible to administer the MEPS-R on-line. Future research should involve further testing of the MEPS-R with different populations especially those at risk of suicide.

7.2 Introduction

The Means-end Problem-solving task (MEPS; Platt & Spivack, 1975) is a measure that tests an individual's actual problem-solving ability. Participants are instructed to consider real life problem scenarios and asked to respond with ways in which they would go about solving a particular problem (from a pre-existing set of scenarios). In the previous (Chapter 6), the original MEPS was revised and updated to yield the MEPS-R. The aim of this chapter is to describe two separate studies that were conducted to test this revised measure. This chapter begins by providing some background information related to the administration and scoring of the MEPS before describing the two studies. It is beyond the scope of this chapter to detail all of the differences and changes that have been applied to the MEPS over the decades, therefore, this chapter focuses specifically on the most important developments which are relevant to the present research.

As previously detailed (Chapter 6), the MEPS (Platt & Spivack, 1975) assesses an individual's problem-solving skills, in other words their problem-solving performance. This form of social problem-solving measurement is concerned with the quality of solutions that individuals generate; it is a measure of an individual's performance. Platt and Spivack (1975) designed the MEPS, as an element of real-life problem-solving, as means-end thinking which taps an 'individual's ability to orient himself to, and conceptualise a means of moving toward a goal.' In Chapter 3, the MEPS was identified as one of the most commonly used measures of social problem-solving in psychological health research. Indeed, numerous studies have shown that poor social problem-solving is associated with psychological distress (including depression and suicidality). This therefore demonstrates that it is a vital measure within suicide research, (Schotte & Clum, 1987; Williams, Barnhofer, Crane & Beck, 2005).

Although widely used, there are a number of limitations to the MEPS (which were discussed in Chapter 6). Aside from the issue of scenarios being modified for use in different studies, many studies have also employed different procedures and scoring methods. Such differences in the content, administration and scoring of the MEPS make it difficult to draw comparisons across studies.

7.2.1 Administering of the MEPS

Platt and Spivack (1975) designed the MEPS to be delivered either in an interview format or via pen and paper. The most common method of delivery, however, has been via an interview, with the researcher reading out the scenarios and the participant providing verbal responses. Traditionally, responses are written down with many authors also recording the responses for later transcription. The original MEPS administration manual presents the scenarios in the third person, yet many researchers have presented the scenarios in the second person. By using the second person it was argued that it would be easier for the participants to imagine themselves in a particular situation/scenario. House and Scott (1996) stated that differences in how the problems are presented could have an impact on how a participant responds to the scenarios. Furthermore, House and Scott (1996) stated that there was a lack of realism in the original instructions which asked participants to 'make up a story'. In response to this concern, Marx, Williams and Claridge (1992) changed the procedural instructions from a test of imagination to advising participants to 'find the ideal strategy'.

There has also been marked variability in the time that participants are given to complete the task. For example, in some studies participants are given a certain time to think about the response (Goddard, Dritschel & Burton, 1998) whereas in others, participants are timed in their response (Howat & Davidson, 2002) or they are given a set amount of time to respond (Williams et al., 2005). These variations are generally investigated in further analyses but have had no real bearing on the quality of the responses and how the scenarios are scored.

7.2.2 Scoring the MEPS

The original manual for the MEPS (Platt & Spivack, 1975) scored the scenarios on: the number of relevant means, obstacles, enumeration of means, time, irrelevant means, no-means responses and story content. This scoring was later revised by Spivack, Shure and Platt (1985) to yield a total score that sums the number of relevant means, obstacles and time. Butler and Meichenbaum (1981) further recommended a form of scoring to differentiate participants who produce the same quantitative score (number of relevant means) but who differed in the effectiveness of the scores. Marx et al. (1992) responded to this suggestion by introducing an effectiveness rating, which provides a qualitative rating to the scoring and therefore identifies differences in scores based on the quality of the solution. Other changes included dividing the relevant means into active and passive

means steps. Indeed, Linehan, Camper, Chiles, Strossahl and Shearin (1987) posited that relevant means should be broken down into active and passive means. This then differentiated between participants who could 'be awarded a relevant mean even when it reflects a passive solution'; therefore the scoring would be the same as for someone generating active solutions. These developments in scoring have led to more differences in how researchers score the MEPS. Nevertheless, within the suicide research literature, studies (Goddard et al., 1998; Dritschel & Burton, 1998; Pollock & Williams, 2001;Watkins & Baracaia, 2002 and Williams et al., 2005) have found that two outcome variables are the most pertinent to understanding suicide risk (relevant means and effectiveness) and therefore are the focus of the present research. These two scores produce a quantitative and qualitative score of an individual's social problem-solving ability.

Although the MEPS is usually administered by a single researcher, most studies check that the scoring is reliable. To this end, inter-rater reliability is in the main, carried out by two raters on a sample of the responses. The sampling varies from 15% (Williams et al., 2005) to 20% (Howat & Davidson, 2002) but most studies do not report the percentage of scores that are tested for reliability ratings. The test statistic employed to determine inter-rater reliability also ranges from Pearson's r (Watkins & Baracaia, 2002; Goddard et al.,1996; and Maurex et al., 2010), to Spearman's rho (Howat & Davidson, 2002) and Kappa coefficients (Williams et al., 2005). In general, the studies report good inter-rater reliability. Given that we are testing a new measure, we conducted inter-rater reliability checks on 100% and 50% of the two samples.

In summary, across two studies we aimed (i) to test the revised Means End Problem-Solving Task (MEPS-R), a measure of social problem-solving, by testing the latter's relationship with established correlates of wellbeing and, (ii) to test the measure on-line for the first time.

Specifically, it was hypothesised that the number of relevant means would be negatively associated with stress, depression, defeat and suicide ideation (hypothesis 1). In addition it was also hypothesised that effectiveness ratings would be negatively associated with stress, depression, defeat and suicide ideation (hypothesis 2).
Hypothesis 3 was that the dysfunctional subscales (NPO, ICS and AS) of the SPSI-R would be negatively associated the number of relevant means and effectiveness (hypothesis 4). It was further hypothesised that the functional subscales (PPO and RPS)

would be positively associated with the number of relevant means (hypothesis 5) and effectiveness ratings (hypothesis 6).

7.3 Method Study 1

7.3.1 Participants

Student participants were recruited through an on-line system used by the Psychology Department at the University of Glasgow. General population participants were recruited via on-line adverts on the website Gumtree and the use of social media. All participants received £10 in compensation for their time. Ethical approval had been obtained from the University ethics committee.

A total of 40 healthy adults were recruited with a mean age of 30 years (SD = 13.73), range from 18 years to 59 years. There were 17 males, mean age 29.76 years (SD = 14.14), ranging from 18 years to 59 years and 23 females, mean age 30.17 years (SD = 13.73), ranging from 18 years to 57 years. There was no significant difference between the age of the males and females t (38) = -.09, ns.

Half of the sample (n=20) was students with a mean age of 20.45 years (SD = 3.1), ranging from 18 years to 20 years. There were six males, mean age of 20.17 years (SD = 3.55), ranging from 18 years to 27 years and 14 females, mean age of 20.57 years (SD = 3.03), range from 18 years to 30 years. There was no significant difference between the ages of the student males and females t (18) = -.26, ns.

The remainder of the sample (n=20) were recruited from the general population, they had a mean age of 39.55 years (SD = 13.61) and an age range 18 years to 59 years. There were 11 males, mean age of 35 years (SD = 15.11) age range from 18 to 59 and nine females with a mean age of 45.11 years (SD = 9.53) and range from 24 years to 57 years. There was no significant difference between the ages of the general population males and females t (18) = -.244, ns.

7.3.2 Measures (see Chapter 4 for full details)

7.3.2.1 Social Problem-solving

The Social Problem-Solving Inventory–Revised: Short Form (SPSI-R: SF; D'Zurilla, Nezu & Maydeu-Olivares, 2002) is a 25-item self-report questionnaire with five sub-scales each of which is designed to tap into one of the five constructs that form the theoretical model of social problem-solving (D'Zurilla & Nezu, 1990; see Chapter 4 for full details and Appendix 1). The subscales are: Positive Problem Orientation (PPO; 'Whenever I have a problem I believe it can be solve'); Negative Problem Orientation (NPO; 'I feel threatened and afraid when I have an important problem to solve'); Rational Problem Solving (RPS; 'when I have a decision to make, I try to predict the positive and negative consequences of each option'); Impulsivity/ Carelessness Style (ICS; 'When I am trying to solve a problem I go for the first good idea that comes to mind') and Avoidance Style (AS; 'I wait to see if a problem will resolve itself first, before trying to solve it myself'). Items were designed to reflect cognitive, affective or behavioural responses to real-life social problem-solving situations. Participants are asked to rate the extent to which each statement is true on a five-point Likert-type scale (0 = not at all true of me to 4 = extremely true of me). Total scores for each of the subscales are computed by summing the items and reliability for each subscale was good PPO α =.73; NPO α =.69; RPS α =.72; ICS α = .79 and AS α = .85.

7.3.2.2 Stress

A shorter, 4-item version of the Perceived Stress Scale (PSS; Cohen et al., 1983) was used in this study to reduce the burden of questions on participants (items 2, 6, 7 and 14). Items 6 and 7 are reverse scored. Predictive validities and internal and test-retest reliabilities of the scale have been established as good (Cohen, et al., 1983). Cronbach α for the present sample was .77.

7.3.2.3 Depression

The Beck Depression Inventory-II (BDI-II, Beck et al., 1996; see Appendix 9) was used as a self-report measure of depression. It is a 21 question self-report inventory; each question has four possible responses and each answer can be scored on a scale of 0 to 3. Each of the 21 items on the scale measures how an individual has been feeling in the last two weeks. The total BDI score indicates the severity of the depression. The maximum possible score is 63. This measure is widely used, it has been found to yield internally consistent, and

valid scores and has construct validity (Dozois, Dobson & Ahnberg, 1998; Schotte, Maes, Cluydts, DeDoncker, & Cosyns, 1997). Reliability for this study was α =.91.

7.3.2.4 Defeat

Defeat is conceptualised as sensitivity to environmental cues that signal defeat, and which can give rise to an overpowering feeling of needing to escape. Feelings of defeat were measured using the Defeat Scale (Gilbert & Allan, 1998; see Appendix 4). This is a 16 item self-report measure of perceived failed struggle and loss of rank (e.g. 'I feel defeated by life'). Respondents indicated on a five point Likert-type scale the extent to which each item described their feelings (0 = not at all to 4 = extremely). Items 2, 4 and 9 on the scale are reverse scored and total scores are then calculated with higher scores indicating high levels of defeat. This scale has been found to have good psychometric properties and significantly correlates significantly with depression (Gilbert & Allan, 1998; Gilbert, Allan & Brough, 2002). Reliability of this scale was α =.82.

7.3.3 MEPS-R task

The measure employed was a revised measure of Platt and Spivack's (1975) original ten scenarios. Details describing the procedure for developing the scenarios are explained in Chapter 6, along with the presentation of the revised scenarios.

Participants were presented with ten problem scenarios on cards that were simultaneously read aloud by the experimenter. Each scenario outlined an initial situation in which there was a problem to be solved and a desired end point (Marx, Williams & Claridge, 1992; Platt et al., 1975). In line with previous studies, rather than presenting the MEPS-R as a test of the imagination, a clear problem set was introduced (Marx et al., 1992; Watkins & Baracaia, 2002) and participants were instructed to 'find the ideal strategy.' The ten scenarios were randomised using a web-based randomizer programme to allocate the order in which the scenarios were presented for each participant.

Participants' responses were written down by the experimenter and then typed up before rating. For each MEPS-R scenario, two dependent variables were derived: the overall effectiveness of a participant's response, which was rated blind on a 7-point Likert-type scale, (internal reliability was good at α =.91; details below) and the number of relevant means (α =.85; active problem-solving steps) that the participant produced. The ratings were derived on the basis of the total responses given by participants to each problem item.

Transcripts were rated by two independent raters, consistency between raters was established on the full sample of 100% of the cases yielding coefficients (Cohen, 1960) of $_k$ (.70), p < .001 for number of relevant means and $_k$ (.65), p <.001 for ratings of effectiveness, both of which are viewed as good (Landis & Koch, 1977). Participants' effectiveness ratings and relevant means' scores were summed across all ten scenarios.

As these were revised scenarios a new coding framework was developed (Appendix 19 for full details). The coding framework provides guidelines on how to score each scenario along with common categories identified for each scenario.

7.3.3.1 Relevant means

Consistent with Williams et al. (2005) only relevant means were counted when scoring the MEPS-R.

A relevant means was scored for each discrete step which was effective in enabling the hero of the story to reach the resolution stage of the story or to overcome an obstacle preventing the hero from reaching the goal in the story." (Platt & Spivak, 1975, p21). This was scored in accordance with Platt and Spivack's (1975) guidelines.

A single sentence can contain more than one discrete mean while a number of sentences may constitute a single mean. To counteract this problem a list of categories of relevant means was devised for each scenario (see below). Each category represents a distinct type of action that might be taken in order to achieve the story-ending, that is, a category corresponds to a discrete step. Thus, if a participant suggests multiple actions belonging to a single category, these constitute a single discrete step and should be counted as one means.

7.3.3.2 Categories of Relevant Means

Platt and Spivak's (1975) original manual provides a list of categories, which was used as a starting point to identify categories for each scenario, along with an unpublished MEPS manual (Ryan & O'Connor, unpublished manuscript). The following section details the categories identified for each scenario.

Scenario 1: You love your partner very much, but recently you have been having a lot of arguments and you want to do something to make things better between you both.

The story ends with things being better between you.

    A. Introspection

    B. Establish contact

    C. Discussion

    D. Quality time together

    E. Speak to a third party

    F. Change behaviour

    G. Avoid them for a while/time out

    H. Self strategies to cope

Scenario 2: You come home after being out and realise that you have lost your wallet/purse or mobile.

The story ends with you finding your wallet/purse or mobile.

    A. Introspection

    B. Check places been

    C. Physically retrace steps

    D. Report it to the authorities

    E. Check self, bags and home.

    F. Ring mobile

Scenario 3: You have just moved home and want to meet new people in the area.

The story ends with you knowing new people in the area.

    A. Neighbours

    B. Join clubs/groups

    C. Involved in social activities

    D. Be generally friendly

    E. Volunteer work

    F. Meet friends through friends

Scenario 4: You notice that your friends seem to be avoiding you and you want things to be how they were previously.

The story ends with all being well between you and your friends again

    A. Introspection

    B. Speak to friend

    C. Speak to third party

    D. Establish contact and keep in contact

    E. Change behaviour/apologise

    F. Think about a neutral relaxing location

    G. Give them some space for a while

Scenario 5: You are having problems getting along with a colleague at work.

The story ends with you and your colleague getting along well

    A. Introspection

    B. Speak to third party

    C. Speak to the person

    D. Be nice, find common ground or change behaviour

    E. Socialise outside work

    F. Self strategies to cope

Scenario 6: You realise that money is tight this month and you are going to have problems paying an important bill.

The story ends with you being able to pay the bill

    A. Budget

    B. Cut back

    C. Strategies

    D. Borrow money

Scenario 7: You and a friend have been messaging by text and you are upset by something they have written.

The story ends with you being no longer upset.

    A. Introspection

    B. Establish contact

    C. Speak to a third party

    D. Discussion

    E. Avoid them for a while

Scenario 8: You are worried about the health of a close friend or relative and you are not sure what to do.

The story ends with you no longer being worried about your close friend/relative's health.

    A. Introspection

    B. Speak to third party

    C. Speak to them about it

    D. Support them

    E. Research the problem

Scenario 9: A friend has been repeatedly letting you down recently.

The story ends with you no longer feeling let down.

    A. Introspection

    B. Speak to third party

    C. Discussion

    D. Change behaviour

    E. Cognitive readjustment

Scenario 10: You have been really worried about what a friend thinks of you.

The story ends with you feeling less worried about what your friend thinks of you.

    A. Introspection

    B. Speak to third party

    C. Discussion

    D. Avoidance

    E. Cognitive readjustment

    F. Change behaviour

It is worthy of note that not all responses fall into all of these categories. There was the odd response that required a judgment call as to whether that strategy would be scored as a discrete step. As previously stated Appendix 19 gives full details of the scoring guidelines.

Relevant means (active problem-solving steps) were scored using category sheets (see Appendix 12 for a full description). The total number of categories (mean steps) was totalled for each participant per scenario, then the scores for each participant's ten scenarios were totalled which gave each participant a total relevant means score across all ten scenarios. The inter-rater reliability for the raters for 100% of the scenarios was good kappa = .80, p<.001.

7.3.3.3 Scoring Effectiveness

Effectiveness was defined according to the definition of an effective problem solution provided by D'Zurilla and Goldfried (1971). Following this definition a problem solving-solving strategy is deemed to be effective if it maximizes positive short and long-term consequences and minimizes negative (short and long-term) consequences, both personally and socially. The overall effectiveness of each strategy was rated on a 7-point Likert-type scale ranging from "1 - not at all effective" to "7 - extremely effective". Scores were then totalled for each participant on all ten scenarios. No changes were made to how effectiveness was scored, scoring was the same as that detailed by Williams et al. (2005). The inter-rater reliability for the raters of 100% of the responses was good Kappa .75, $p <$. 001.

7.3.4 Procedure

Ethical approval was granted from the University Of Glasgow's Ethics committee before commencement of this study. Participants met with the researcher, the study was described fully and then each participant was invited to read and sign the information sheet and consent form. Once the participant had consented they were presented with a questionnaire packet which contained the following measures: the Beck Depression Inventory (BDI; BDI-II, 1996); The Social Problem-Solving Inventory–Revised: Short Form (SPSI-R: S; D'Zurilla, Nezu & Maydeu-Olivares, 2002); the Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983) and the Defeat Scale (Gilbert & Allan, 1998). This took each participant about 15 minutes to complete.

Participants were informed that the ten scenarios would be read aloud to them; in addition they were told that they would be shown a card with each scenario written on it. Participants were advised that each scenario included a problem to be solved and that they would also be provided with the ending to the problem. Participants were then informed that they were required to describe the best way to solve the problem, in other words they must connect together the beginning and the end of each of the scenarios, providing the 'ideal strategy' to solving the problem (Marx, et al., 1992). As participants described how they would solve each problem scenarios the researcher recorded this information by writing out their responses. This information was then typed up onto an excel sheet for scoring to be carried out. All scenarios were then printed off and a copy was distributed to each researcher involved in the scoring. Each researcher would score, for example five

participant responses to scenarios 1 and then come together to discuss any issues and agree how the scenario should subsequently be scored.

7.3.5 Statistical Analysis

Standard descriptive statistics were conducted using SPSS 21.

7.4 Results (Study 1: Face-to-face study)

Means, standard deviations and correlation analyses were calculated for all of the study variables.

Table 7.1: Zero order correlations, means and standard deviations for the number of relevant mean scores for each MEPS-R scenario

Scenario	1	2	3	4	5	6	7	8	9	10
1	-									
2	.19	-								
3	.50**	.22	-							
4	.35**	.16	.50**	-						
5	.40**	.31	.54***	.59***	-					
6	.19	.50**	.37*	.60***	.47**	-				
7	.44**	.35*	.25	.52**	.55***	.36*	-			
8	.47**	.24	.39*	.55***	.31*	.34*	.50**	-		
9	.39*	.10	.49**	.25	.29	.29	.22	.26	-	
10	.40*	.33*	.48**	.41**	.50***	.31	.48**	.34*	.28	-
Means	3.33	3.78	3.63	3.50	3.25	3.2	2.9	3.6	2.45	2.08
SD	1.25	1.49	1.40	1.13	1.34	1.51	1.13	1.40	1.01	.97

Correlation is significant at $*p < .05$ ** Correlation is significant at $p < .01$
***Correlation is significant at $p < .001$

Table 7.1 shows the inter-correlations, means and standard deviations for the number of relevant means for each of the ten MEPS scenarios. Not all the scenarios were significantly correlated with each other, although all the scenarios that were significantly related were positively correlated. The strongest correlation was between scenarios six and four ($r = .60$, $p < .001$) with the weakest significant correlation being ($r = .33$, $p < .05$) between scenario ten and two. Scenario nine had the fewest significant correlations with other scenarios; it only correlated with scenario one ($r = .40$, $p < .05$) and three($r = .48$, $p < .01$). Scenario two only correlated with scenario six ($r = .50$, $p < .01$), seven ($r = .35$, $p < .05$) and ten ($r = .33$, $p < .05$). Apart form scenario six which was significantly correlated with six scenarios all other scenarios correlated with seven other scenarios.

Table 7.2 shows the inter-correlations, means and standard deviations for each of the ten effectiveness scores for each scenario. All of the effectiveness scores were positively intercorrelated except for scenario six, which was not significantly related to scenarios three and nine.

Table 7.2: Zero order correlations, means and standard deviations for the total effectiveness scores for each MEPS-R scenario

Scenario	1	2	3	4	5	6	7	8	9	10
1	-									
2	.69***	-								
3	.45**	.39*	-							
4	.43**	.55**	.50**	-						
5	.51**	.63***	.47**	.62***	-					
6	.41**	.57***	.26	.71***	.65***	-				
7	.51**	.64***	.36*	.46**	.55***	.44**	-			
8	.51**	.54***	.44**	.63***	.46**	.53***	.54***	-		
9	.58***	.49**	.46**	.42**	.34*	.29	.61***	.55***	-	
10	.65***	.65***	.36*	.55***	.60***	.51**	.55***	.51***	.58***	-
Means	5.28	6.05	5.80	5.58	5.58	5.58	5.23	5.68	5.00	4.85
SD	1.19	1.19	1.45	.93	1.15	1.19	1.25	.94	1.17	1.27

Correlation is significant at *P < .05 ** P < .01; *** P < .001

Table 7.3: Zero order correlations, means and standard deviations for all of the study variables

	1	2	3	4	5	6	7	8	9	10
1. PPO	-									
2. NPO	.47**	-								
3. RPS	.47**	-.03	-							
4. ICS	-.15	.06	-.22	-						
5. AS	-.29	.46**	-.06	.53**	-					
6. Stress	-.26	.44**	-.01	.04	.15	-				
7. BDI-II	-.22	.34*	-.12	.05	.17	.72**	-			
8. Defeat	-.08	.34*	.05	.05	.14	.61**	.71**	-		
9. Means	-.20	-.08	-.14	.14	.27	.05	.01	-.15	-	
10. Effectiveness	-.26	.04	-.29	-.05	.10	.16	.09	-.11	.84***	-
Means	13.00	5.65	11.57	4.84	4.19	5.25	9.60	13.21	31.73	54.60
SD	3.83	3.18	3.62	3.72	3.65	2.95	8.36	9.83	8.36	8.80

PPO: Positive problem orientation; NPO: Negative problem orientation; RPS: Rational problem-solving; ICS: Impulsive/careless problem-solving: AS: Avoidance style; BDI-II: Depression; Means: number of relevant means and Effectiveness: Effectiveness scores.

Correlation is significant at *P < .05; ** P < .01; *** P < .001

Table 7.3 shows that the number of relevant means and effectiveness ratings were significantly correlated with each other (r =.84. p <.01). Counter to the experimental

hypothesis, neither the relevant means or effectiveness scores correlated with any other variable. Depression was significantly correlated with stress ($r = .72$, $p < .01$) and defeat ($r = .71$, $p < .01$. The social problem-solving subscales PPO and RPS were positively correlated ($r = .47$, $p < .01$) and PPO was negatively correlated with NPO ($r = -.47$, $p < .01$); AS was significantly correlated with NPO ($r = .46$, $p < .01$) and ICS ($r = .53$, $p < .01$). NPO was the only social problem-solving subscale to be significantly correlated with depression ($r = .34$, $p < .05$); stress ($r = .44$, $p < .01$) and defeat ($r = .34$, $p < .05$).

7.5 Discussion

Although there were substantial inter-correlations between the number of means generated for each of the scenarios, not all of the scenarios were significantly correlated. The inter-correlations for the effectiveness ratings were all positively correlated except for scenario six, which did not correlate with two of the other scenarios.

This study had two limitations, the first was the study design, as only the new and revised scenarios (MEPS-R) were employed and none of the original ten scenarios (Platt & Spivack, 1975) were included. One consideration could have involved an additional group of participants completing the original measure or a second method could have counterbalanced five of the originals and five new scenarios. This would have allowed each participant to complete five of the original scenarios and five of the revised scenarios. The use of this method would have enabled a more detailed comparison in the results to investigate any differences between the old and revised measure. In addition, by employing both measures this would have potentially increased the reliability and validity of the revised measure.

A second limitation was the method of this study design was that the researcher did not audio record participant responses. The use of audio recording could have been a more reliable method of recording data and provided a secondary source of data. Nevertheless, the researcher advised participants, when necessary; to slow down and all responses were typed up on the same day.

The results of this study failed to yield any significant correlations between the number of relevant means and effectiveness ratings and any other study variables. However, the relevant means and effectiveness scores were highly correlated with each other, suggesting that unsurprisingly, there was a strong relationship between the number of mean steps

generated by participants and how effective the strategies were rated. Consistency between raters was good for both means and effectiveness.

7.6 Introduction: Study two (on-line study)

The aim of this study was to test the MEPS-R using an on-line method for the first time. The rationale for testing the MEPS-R using a remote access website is two-fold. Firstly, participants may feel less conscious about describing personal issues, therefore this method may produce more valid responses. Secondly, as the MEPS task can be a lengthy task to administer (and for this reason many researchers do not use all ten scenarios), the proposed online administration may be more attractive to researchers as it is much less time-consuming.

7.7 Method 2 (on-line study)

7.7.1 Participants

Healthy adults were recruited via the university's on-line experimental management system and participants received one course token for their participation. Social media was also used as a snowballing technique to attract other participants. Participants were provided with a link to the study website once they had decided to take part in the study. Ethical approval had been obtained from the University ethics committee.

A total of 247 participants took part in the study. The mean age of the sample was 22.45 years (SD = 7.85), with an age range of 17 years to 56 years. There was a total of 215 females, with a mean age of years of 22.57 years (SD = 8.15), age range was 17 years to 56 years and 32 males, with a mean age of 21.63 years (SD = 5.5), with the following age range 18 years to 43 years. There was no significant difference in age between the males and females, t (245) = -.64, *ns*.

Of the total sample (n=247), 214 were students with a mean age of 20.43 years (SD = 4.8), with a range from 17 years to 52 years. There were 186 females, with a mean age of 20.5 years (SD = 5.06), age range 17 years to 52 years and 28 males with a mean age of 19.93 years (SD = 2.48), age range 18 years to 28 years. The males and females were of a similar age, t (212) = -.59, ns.

The remainder of the sample (n=33) was recruited from the general population with a total mean age of 35.58 years (SD = 10.74), age range 19 years to 56 years. Only four of these

participants were male with a mean age of 33.5 years (SD = 6.58), age range 28 years to 43 years. The mean age of females (n=29) was 35.86 years (SD = 11.25), with an age range from 19 years to 56 years. There was no significant difference between the males and females ages, t (31) = -.41, ns.

7.7.2 Measures

In addition to completing the measures (of social problem-solving, stress, depression, and defeat) that were employed in the previous study (see section 7.3.2), participants also completed the Beck Scale for Suicide Ideation (BSSI; Beck & Steer, 1993). For the sake of brevity, the details of the measures are not repeated here (see section 7.3.2); only the internal consistency scores for each of the measures are detailed in Table 7.4 below. These all exceed the generally agreed levels of acceptability.

Table 7.4: Internal consistency scores for the study measures

Scale	Cronbach's Alpha
PPO	.71
NPO	.79
RPS	.71
ICS	.76
AS	.85
Stress	.80
BDI-II	.93
Defeat	.86
BSSI	.87
Means	.83
EFF	.80

PPO: Positive problem orientation; NPO: Negative problem orientation;
RPS: Rational problem-solving; ICS: Impulsive/careless problem-solving:
AS: Avoidance style; BDI-II: Depression and BSSI: Beck suicide ideation scale;
Means: the number of means and Eff: effectiveness scores

7.7.2.1 Suicide ideation

Suicide ideation was assessed using the Beck Scale for Suicidal Ideation (BSSI; Beck & Steer, 1993; see Appendix 12). The BSSI is a well-established 21-item scale measuring suicidal thinking over the preceding seven days. Items are scored 0 to 2 for example 'I have no desire to kill myself' (0) to 'I have a moderate to strong desire to kill myself '(2). The self-report version of the scale has good concurrent validity and internal consistency (Luxton, Rudd, Reger & Gahm, 2011). Internal consistency for this study was found to be good at α =.87.

7.7.2.2 MEPS-R task

This measure is described in section 7.3.3. Scoring for the scenarios was also carried out in the same way as in study 1.

7.7.3 Procedure

This study received ethical approval from both the University of Glasgow and the University of Stirling, as participants were recruited from both Universities. After completing the information sheet and consent form participants then completed a battery of questionnaires. This took participants about 15 minutes to complete.

Participants were then provided with instructions about how to complete the MEPS-R, after which they were given an example scenario to aid their understanding of how to complete the task. Participants were further informed that they would be required to type their answers out in response to each scenario. Scenarios were presented in a randomised order, at the top of the page participants could read the instructions each time to remind them how to respond to the scenarios. Participants were provided with the beginning and ending of each scenario and instructed to complete the middle section of each scenario, i.e., to state how they would solve the problem. In addition participants were informed that they could not go back to a previous scenario nor could they move on to the next scenario until that scenario had been completed. This task took participants about 40 minutes; the total time for the study was approximately one hour.

The study website produced a PDF document of all participants' responses. For each MEPS-R scenario, two dependent variables were derived: the overall effectiveness of the participant's response, which was rated blind on a 7-point Likert-type scale (details below) and the total number of relevant means (active problem-solving steps) the participant produced. The effectiveness ratings were derived on the basis of an evaluation of a participant's overall response (i.e., the number of means and their quality) to each scenario. Transcripts of participants' responses for the MEPS-R task were rated by two independent raters, consistency between raters was established on a random sample of 50% of the cases yielding coefficients of $_k$ (.73) p <.001 for number of relevant means and $_k$ (.66) p< (.001) for ratings of effectiveness which are both rated as good (Landis & Koch, 1977). Participants' effectiveness ratings and relevant means scores were summed across all ten scenarios.

7.7.4 Statistical Analysis

Mean scores and correlational analyses were calculated for the MEPS-R scenarios using SPSS 21.

7.8 Results (Study 2: Online study)

Table 7.5: Zero order correlations, means and standard deviations for total number of means for each MEPS-R scenarios

Scenario	1	2	3	4	5	6	7	8	9	10
1	-									
2	.39***	-								
3	.46***	.43***	-							
4	.40***	.48***	.41***	-						
5	.50***	.39***	.45***	.52***	-					
6	.39***	.42***	.31***	30***	.37***	-				
7	.46***	.40***	.40***	.46***	.43***	.29***	-			
8	.37***	.39***	.36***	.41***	.36***	.36***	.31***	-		
9	.31***	.35***	.36***	.34***	.37***	.24***	.28***	.24***	-	
10	.18**	.22***	.19**	.10	.17**	.19**	.13*	.10	.11	-
Means	2.73	2.67	2.32	2.83	2.52	2.40	2.07	2.55	2.00	1.83
SD	1.22	1.18	1.20	1.19	1.21	1.38	1.08	1.19	1.28	1.16

Correlation is significant at *P $< .05$ ** P $< .01$ *** p $< .001$

Table 7.5 shows the inter-correlations, the means and standard deviations for each of the total number of means generated for each of the ten problem-solving scenarios. All of the scenarios were positively correlated with each other apart from scenario ten, which was not significantly correlated with scenario four, eight and nine.

Table 7.6: Zero order correlations, means and standard deviations for total effectiveness scores for each MEPS-R scenario

Scenario	1	2	3	4	5	6	7	8	9	10
1	-									
2	.34***	-								
3	.40***	.3***	-							
4	.29***	.28***	.18**	-						
5	.40***	.32***	.33***	.30***	-					
6	.28***	.31***	.27***	.04	.25***	-				
7	.30***	.34***	.38***	.35***	.25***	.23***	-			
8	.30***	.36***	.29***	.28***	.23***	.28***	.30***	-		
9	.36***	.33***	.35***	.23***	.37**	.17**	.28***	.18**	-	
10	.20***	.21***	.27***	.34***	.24***	.16**	.28***	.22***	.37**	-
Means	4.69	5.03	4.78	4.96	4.59	4.74	4.50	4.87	4.36	429
SD	1.18	1.07	1.20	1.05	1.11	1.20	1.15	.94	1.39	1.12

Correlation is significant at *P $< .05$ ** P $< .01$, *** p $< .001$

Table 7.6 shows the inter-correlations, means and standard deviations for each of the ten effectiveness scores for each scenario. All the effectiveness scores were positively inter-correlated except for scenario six, which was not significantly related to scenario four.

Table 7.7 shows that the number of relevant means and effectiveness ratings were significantly correlated with each other ($r = .14$. $p < .01$). However, neither the relevant means nor effectiveness ratings correlated with any other variable. Depression was significantly correlated with stress ($r = .18$, $p < .01$) and defeat ($r = .83$, $p < .001$) and suicide ideation ($r = .70$, $p < .001$).

The social problem-solving subscales PPO and RPS were positively correlated ($r = .43$, $p < .001$) and PPO was negatively correlated with NPO ($r = -.46$, $p < .001$) and AS ($r = -.49$, $p < .001$); AS was positively correlated with NPO ($r = .50$, $p < .001$) and ICS ($r = .39$, $p < .001$).

Depression was negatively correlated with PPO ($r = -.39$, $p < 001$) and negatively correlated with NPO ($r = .55$, $p < .001$) and AS ($r = .41$, $p < .001$). Defeat was positively correlated with NPO ($r = .53$, $p < .001$) and AS ($r = .35$, $p < .001$). Suicide ideation was negatively correlation with PPO ($r = -.24$, $p < .001$) and positively correlated with NPO ($r = .37$, $p < .001$) and AS ($r = .22$, $p < .001$).

7.8.1 Comparing face-to-face and on-line scores

An independent samples t-test was conducted to compare the difference between the number of relevant means and effectiveness ratings between the face-to-face study and the on-line study.

Table 7.8 Means and SD for number of relevant means and effectiveness ratings in both face-to-face and on-line study

	F2F	On-line
Relevant Means	31.73 (SD 8.36)	23.91 (SD 7.67)
Effectiveness	54.60 (SD 8.8)	46.81(SD 6.82)

F2F: face-to-face study; On-line: online study

A significant difference in the number of means reported was found between the face to face study and the online study t (285) $= 5.9$, $p < 001$. The number of relevant means recorded in the face-to-face study were higher (31.73, $SD = 8.36$) than those recorded for the on-line scores (23.91, $SD = 7.67$).

A significant difference in the effectiveness ratings was found between the face to face study and the online study t (285) = 6.4, p < 001. The effectiveness scores recorded in the face-to-face study were higher (54.6, SD = 6.82) than those recorded for the on-line scores (46.81, SD = 6.82).

Table 7.7 Correlations, means and standard deviations for all study variables

	1	2	3	4	5	6	7	8	9	10	11
1. PPO	-										
2. NPO	-.46***	-									
3. RPS	.43***	-.02	-								
4. ICS	-.041	.23***	-.23***	-							
5. AS	-.49***	.50***	-.11*	.39***	-						
6. Stress	.038	.11*	.21**	-.09	.03	-					
7. BDI-II	-.39***	.55***	.01	.15*	.41***	.18**	-				
8. Defeat	-.40***	.53***	.06	.04	.35***	.22**	.83***	-			
9. BSSI	-.24***	.37***	.04	.02	.22***	.09	.70***	.66***	-		
10. Means	.05	-.09	.12	-.04	-.06	.01	.004	.04	-.09	-	
11. Effectiveness	.02	-.05	.02	-.06	-.02	-.04	-.05	.16	-.05	.14**	
Means	8.06	9.01	10.2	5.66	6.33	8.06	15.95	20.43	1.03	23.91	56.25
SD	3.17	4.23	3.74	3.76	4.51	1.74	12.97	10.48	2.17	7.67	7.24

PPO: Positive problem orientation; NPO: Negative problem orientation; RPS: Rational problem-solving; ICS: Impulsive/careless problem-solving; AS: Avoidance style; BDI-II: Depression; BSSI: suicide ideation; Means: Number of relevant means and Effectiveness: Effectiveness scores.

Correlation is significant at *p < .05 ** p < .01 *** p < .001

7.9 Discussion

The inter-correlations between the number of means were all positively correlated except for scenario 10 which did not significantly relate to scenarios four, eight and nine. All of the effectiveness ratings for each scenario were also positively inter-correlated except scenario six, which was not associated with scenario three and nine.

Unexpectedly, the results of this study failed to yield any significant correlations between the relevant means scores and effectiveness ratings and any of the other study variables. Relevant means and effectiveness scores were highly correlated with each other, suggesting that there was a strong relationship between the number of mean steps identified and how effective the strategies were. Consistency between raters was good for both the ratings of relevant means and effectiveness, which was assessed on 50% of the cases.

7.10 General Discussion

The original aims were met. Specifically, the two aims of this study were, firstly, to test new and revised scenarios from the means end problem-solving procedure (MEPS-R), a measure of social problem-solving, by testing the latter's relationship with established correlates of wellbeing. Second, to test the measure on-line for the first time.

In relation to the specific study hypotheses it was hypothesised that the number of relevant means (hypothesis 1) or effectiveness ratings (hypothesis 2) would be negatively associated with stress, depression, defeat and suicide ideation This finding was not supported as neither the number of relevant means nor the effectiveness ratings found to correlated with any known correlates of psychological distress.

It was also hypothesised (hypothesis 3) that the dysfunctional subscales (NPO, ICS and AS) of the SPSI-R would be negatively associated the number of relevant means and effectiveness (hypothesis 4). In addition, it was further hypothesised that the functional subscales (PPO and RPS) would be positively associated with the number of relevant means (hypothesis 5) and effectiveness ratings (hypothesis 6). Support was not found for

any of these hypotheses as none of the subscales of the SPSI-R were found to correlate with the total number of means or the effectiveness ratings.

7.10.1 Testing the MEPS-R by investigating its relationship with established correlates of wellbeing

Two separate studies tested the MEPS-R. The first study involved interviewing participants face-to-face and in the second study, a remote access website was employed. Neither of the studies found any significant relationships between the two indices of actual problem-solving (assessed via the MEPS-R) and the dimensions of social problem-solving as assessed via questionnaire (SPSI-R). It is difficult to make direct comparisons with previous research because these earlier MEPS studies (e.g., Platt & Spivack, 1975) rarely reported the correlation between the different measures of social problem-solving, focusing instead on reporting the differences between participant groups. Nonetheless, studies which have reported correlations (Dieserud, Psychol, Roysamb, Ekeberg & Kraft, 2001; Linda, Marroquin & Miranda, 2012) found no significant correlations with the problem solving inventory (a process measure of social problem-solving), depression and suicide ideation. However, a further study by Dieserud, Roysamb, Braverman, Dalgard and Ekeberg, (2003) found negligible correlations between the number of relevant means, the problem solving inventory (a process measure of social problem-solving), depression and suicide ideation. When comparing the mean scores for participants in the two Dieserud studies (2001, 2003), interestingly, the study which produced the significant findings with the MEPS, depression and suicide ideation (Dieserud, 2001) had much lower mean scores than the study which did not produce any significant findings (Dieserud et al., 2003). This may indicate that the lack of findings is due to other studies having a sample of participants that are more highly distressed. This could mean that testing the measure with known correlates of wellbeing is not the ideal way to test the utility of this measure. The lack of correlations between the MEPS-R and the SPSI-R could also reflect the fact that they are measuring very different constructs.

As previously mentioned in Chapter 3, the SPSI-R is a process measure and therefore measures an individuals appraisal of social problem-solving performance, whereas the MEPS is measuring actual problem-solving ability. Herein lies the difficulty measuring the relationship between these two measures. Individuals will score how they believe they deal with life's problems with the SPSI-R but in reality their actual problem-solving

performance may not be what their appraisal of their performance is (MEPS). It is also important to consider that the SPSI-R measures five different constructs of social problem-solving but these constructs are not necessarily considered when scoring the MEPS. An example of this would be avoidance style, acts of avoidance were not scored in the MEPS-R scenarios, and therefore one would expect the discriminant validity to be low with the MEPS-R and the avoidance style construct of the SPSI-R. Indeed, the correlations between all the subscales of the SPSI-R and the MEPS-R were low, indicating good discriminant validity. Nevertheless, we would not expect all the subscales to be low, PPO and RPS would be expected to correlate highly with actual problem-solving performance, which they do not therefore indicating low convergent validity, when one would expect convergent validity to be high. In general the validity for the MEPS-R was not good in these two studies as it did not correlate with other known correlates of social problem-solving. Therefore, the results of this study in terms of validity are not clear and further research into the validity of the MEPS-R and the relationship with the SPSI-R requires further research.

Another difficulty with comparing the scores form this study with previous studies is in relation to the number of scenarios used by researchers in studies. In this study ten scenarios were used, whereas the common number for studies was four (Biggam & Power, 1999ab; Eidhin et al., 2002, or five (Pollock & Williams, 2001; 2004; Diererud et al., 2001, 2003). The authors could only find one study in suicide research which had utilised all ten scenarios (Howat & Davidson, 2002). However, it is not possible to directly compare the present findings to theirs as the scoring method they employed was different to the one used in this study. In short, therefore, it is difficult to meaningfully compare the present results to other MEPS studies.

7.10.2 Testing the MEPS-R on-line

The second aim of the studies reported herein was to test the MEPS-R on-line. There appeared to be no difficulties with doing so, it was an effective and efficient method of administering this measure. Evaluating participant non-completion rates shows that a total of 257 participants completed the study up to the first MEPS-R scenario, therefore 10 participants dropped out of the study whilst completing the written responses to the scenarios. Two participants only completed one scenario, then continued no further with the study. Two participants completed three scenarios then dropped out, two participants completed six scenarios before dropping out, with one participant completing seven

scenarios and three participants completing nine of the scenarios before failing to respond to the final scenario. In summary, out of 257 participants only ten participants (3.9%) did not complete all of the MEPS scenarios. This is an indication that participants did not find this method of delivering the measure taxing, there was no evidence of study fatigue and considering most studies only ask participants to respond to four or five scenarios this would appear to be a successful method for delivering this measure.

Analyses compared the mean scores for the relevant means and effectiveness ratings for both studies. The means scores for both relevant means and effectiveness ratings were found to be lower in the on-line study, which was found to be significant. This could be a limitation to delivering this measure on-line as it appears that participants are more economical with their responses when responding on-line. It is worthy of note though that in this particular study participants were responding to ten scenarios in one sitting and fatigue may have been more pronounced due to the isolation of completing the study on-line. In contrast when a participant is in the company of the researcher they are more likely to aim to please the researcher.

As indicated in Chapter 6 an obstacle to yielding acceptable levels of reliability when using the original MEPS was the lack of inconsistency in terms of the procedure researchers used in administering the measure. We believe that by delivering the method on-line the potential for inconsistent administration is reduced. Secondly, administering the MEPS task online reduces the time commitment on the experimenter and affords the opportunity to recruit much larger sample sizes with relative ease. An additional benefit of using a remote access website is that the hosting website collates participants' responses into a single document, which is time saving and also reduces the chance of data recording/inputting errors.

7.10.3 New coding framework for the MEPS-R
As part of developing the MEPS-R, a new coding framework to score the revised scenarios was also developed (see Appendix 19). Although, in the interests of brevity, this is not described in detail here, the new coding framework was developed and
used by the researcher and another research assistant to score all the scenarios. As is evident from the results, all of the scenarios were scored on two indices of social problem-solving: (i) number of relevant means and (ii) effectiveness of the solutions. All scoring was completed by both researchers independently and then reliability analysis was

conducted to investigate the consistency in scoring. Kappa coefficients were tested on 100% of the scenarios in the first study (face-to-face) and good reliability in the scoring was found (Landis & Koch, 1977). In the online study, 50% of responses were coded by both coders (the researcher and an another research assistant) and reliability was also found to be good (Landis & Koch, 1977), these results show that the coding framework seems to be a reliable tool for scoring the new scenarios.

When comparing the internal reliability for both MEPS-R responses from both studies it was found that the internal reliability was slightly better for the face-to-face study than the on-line study. Nevertheless, both studies were very good for internal reliability analysis which supports the reliability of the scenarios coding framework.

7.10.4 Limitations

The standard limitations that apply to all self-report studies apply to this study also. For example, completion of the measures herein may have been subject to social desirability biases. Although, given that the responses were anonymous and confidential in the on-line study, we expect that any social desirability biases were minimised. In addition it is important to acknowledge that no power analysis was conducted before either of these studies. This is partly due the aim of the first study to develop a coding framework and the on-line study had not been employed using this measure before, therefore no comparisons with other studies could be made.

Both studies comprised samples of healthy adults, therefore it is not possible to generalise the present findings to other study populations. As we only employed a single measure of depression in the present research, it might be helpful, in future to investigate the relationship between the MEPS and other indices of depression and psychological distress, more generally. This is an important issue to address, as we had predicted that, consistent with previous research (Dieserud et al., 2003), the MEPS would correlate with depression scores. However, it is important to note that research has been mixed on this finding. Another limitation is that we were not able to investigate potential differences between clinical and control groups within the current study design. Indeed this is an obvious next step for this programme of research. It would also be of interest to investigate the utility of the MEPS within an experimental study design, to determine whether it is sensitive to changes in mood.

In short, it is reasonable to conclude that although the MEPS-R is easy to administer, further testing of this measure is required to investigate where it has utility in understanding psychological distress including suicide ideation and behaviour. To do so, it is important to investigate whether performance on the MEPS-R can discriminate between those with different clinical histories (e.g., self-harm) within the more controlled setting of an experimental study design.

In conclusion, a new method of delivering the MEPS-R (online) was evaluated and found to be an effective method of scale administration. However, the extensive correlational analyses failed to find any significant correlations between the two indices of social problem-solving derived from the MEPS-R scenarios and the other study variables. Further research is required, therefore, to test the utility of the MEPS-R within an experimental design to establish if it discriminates between different groups of participants (e.g., those with different self-harm histories) as would be predicted from previous research employing the original MEPS.

Chapter Eight: Experimental study investigating the relationship between social problem-solving and defeat

8.1 Abstract

Aims

This study aimed to investigate the relationship between different dimensions of social problem-solving, self-harm and other established correlates of suicidality. It also aimed to investigate whether social problem-solving is affected by defeat.

Method

This was a mixed factor study design, which comprised of two parts, whereby a total of 75 participants were recruited from student and general population samples. Part one was completed on-line, where participants completed a battery of measures, including the Social Problem-Solving Inventory (SPSI-R; D'Zurilla, Nezu & Maydeu-Olivares, 2002). The second part involved face-to-face contact with the researcher where participants completed social problem-solving scenarios (MEPS-R) before and after a defeat-inducing task.

Results

Dysfunctional social problem-solving dimensions, the number of relevant means and social problem-solving effectiveness were found to differentiate between individuals who reported self-harm and those who reported no history of self-harm. Dysfunctional problem-solving was further found to be associated with the number of relevant means and psychological distress, specifically defeat and entrapment. Nevertheless, this study found no impact of defeat on problem-solving performance.

Conclusion

This study found that individuals who reported self-harm were more dysfunctional in their problem-solving appraisal and poorer at actual problem-solving performance. A relationship was found between problem-solving appraisal and problem-solving performance however, defeat was not found to impact upon problem-solving. Implications and future directions are discussed.

8.2 Introduction

Changes in mood alter an individual's view of the world, their future and how they feel about themselves (Beck, 1967). This subsequently impacts upon how every day problems are dealt with; it is well documented in the research literature that low mood impacts upon social problem-solving ability (Nezu, 1986; Nezu & Rona, 1988) and recent research has started to disentangle the trait/state debate in relation to the many risk factors associated with suicidality (Williams, et al, 2005). Experimental mood manipulation or mood challenge is a procedure which induces specific mood states using tailored mood induction procedures (Gerrards-Hesse, Spies and Hesse, 1994). The experimental manipulation of mood is especially helpful to enhance our understanding of how small changes in mood can impact upon key psychological risk factors for suicidal behaviour. The differential activation hypothesis (Lau, Segal & Williams, 2004) which, in brief, asserts that it is not the resting levels, for example, of social problem-solving that are key in the suicidal process but rather it is the decrement in social problem-solving when negative mood is re-experienced, that is crucial to suicide risk (see Chapter 2 for a fuller discussion). Mood induction procedures are useful in this respect, as they allow researchers to examine more closely the impact of inducing small changes in mood on suicide risk factors.

As noted elsewhere (Chapter 2), published studies frequently manipulate negative mood using these procedures, however, this paradigm was recently extended to include the manipulation of perceptions of defeat (Johnson, Tarrier & Gooding, 2008). The manipulation of defeat is particularly important in the context of this thesis because defeat is a key factor within the IMV model and it is also reported to moderate the defeat-entrapment relationship (O'Connor, 2011). As a result, this study attempted to investigate the relationship between social problem-solving and defeat with individuals who had/had not reported a history of self-harm. In addition, the study explored the relationship between a self-appraisal measure of social problem-solving (the SPSI-R) and actual problem-solving performance (the MEPS), by examining the relationship between two different types of measures of social problem-solving measures. In addition some of the study hypotheses in this study are guided by the results reported in Chapter 5.

8.2.1 Differential activation hypothesis

One theory as to why individuals remain vulnerable to depression is the differential activation hypothesis (Lau, Segal & Williams, 2004; See Chapter 2 for further details). This theory posits that it is not the resting levels of negative cognitive processes that

determine vulnerability but how easily these cognitions can be reactivated (Williams, Barnhofer & Crane, 2005). Such reactivity is thought to be the observable result of an underlying differential activation process that has developed over the learning history of the individuals. Across a range of studies, this cognitive reactivity has been found to be associated with depression (Lau et al., 2004); hopelessness (William, Van De Does, Barnhofer, Crane & Segal, 2008); positive future thinking (O'Connor & Williams, 2014) and social problem-solving (Williams et al., 2005).

A number of studies have shown the utility of differential activation processes in understanding psychological distress. For example, Goldstein and Willner (2002) found in an experimental study with college students, that a negative music-assisted mood induction caused a worsening of mood and increased perception of defeat. The authors also employed a positive mood induction, which caused a small, but significant increase in mood and a significant decrease in defeat scores. This finding suggests that when depressed mood increases perceptions of defeat and entrapment also increase and vice versa with a positive mood induction. Hopelessness and suicidal ideation have also been found to be reactivated by mild fluctuations in mood (Williams et al., 2008). Williams and colleagues posit that a history of suicide ideation is related to a specific cognitive response pattern, which can be reactivated by even minor fluctuations in mood. These studies provide support for the differential activation hypothesis and extend it from a general theory about depressive relapse to a differential activation theory of suicidality (Williams et al., 2008).

More recently, proximal risk factors have also been found to be reactivated following mood inductions. One such study (O'Connor & Williams, 2014) found that positive future thinking (an established risk factor for suicidal behaviour) was reduced after both a negative mood and defeat induction task. This shows that positive future thinking can be affected by even minor fluctuations in mood or defeat. Another study by Johnson, Tarrier and Gooding (2008) examined the role of defeat in impairing memory. These authors induced defeat in a student population by using a puzzle task (Pegg, Deakin, Anderson & Elliott, 2006) that was impossible to complete (attain the pass rate) and episodic memory was reduced when a situation was appraised as defeating which also increased feelings of defeat. Both of these experimental studies employed a defeat-inducing task and highlight how heightened perceptions of defeat can also reactivate cognitive risk factors.

8.2.2 Defeat

As discussed elsewhere (Chapter 1 and 2) the concept of defeat is not new to the psychopathology research literature; it has been associated with depression (Gilbert & Alan, 1998) and the aetiology of suicidality (O'Connor, 2003; 2011) for many years. Defeat is characterised as a sense of failed struggle, when an individual has been defeated by a triggering event or circumstances (Gilbert & Alan, 1998). Specifically within the IMV model (O'Connor, 2011), defeat alongside entrapment, characterise key components within the final common pathway to suicidal behaviour. Entrapment can be triggered by increased perceptions of defeat, but it is the threat to self moderators (TSM) within the model that strengthen the relationship between defeat and entrapment. Indeed, social problem-solving is posited to be one such moderator as it can be activated to provide solutions to deal with the defeating situation – and if problem-solving is ineffective the likelihood of entrapment ensuing increases.

8.2.3 Social problem-solving and defeat

Feelings of defeat and social problem-solving are, therefore, central to the formation of suicidal thoughts. As has already been discussed, defeat has been found to have a negative impact upon memory (Johnson et al., 2008) – and this is important because memory biases are thought to underlie deficits in social problem-solving. In addition in Chapter 5, there was empirical evidence to support the defeat–social problem-solving relationship – as defeat was correlated with NPO, ICS and AS and PPO. These results show that dysfunctional problems-solving subscales (AS, ICS and AS) are associated with high levels of defeat, whereas viewing problems as a challenge and something to be solved (PPO) is associated with low levels of defeat. As detailed in Chapter 2 the diathesis-stress hypothesis posited that social problem-solving is a key vulnerability when activated by stress but Williams, Barnhofer, Crane and Beck (2005) have suggested that the diathesis-stress model is insufficient to explain the nature of the relationship between social problem-solving and suicidality.

Other attempts to explain the relationship between social problem-solving and suicide risk have included work by Biggam and Power (1999) who first highlighted that social problem-solving did not appear to be a stable trait-like risk factor but a state corollary of suicidality. In a prison population they found social problem-solving to be poorer in a crisis but that it rapidly recovers thereafter (see Chapter 3). More recently, Williams et al (2005) went on to show that levels of mood affect social problem-solving ability. While

employing the MEPS (Platt & Spivack, 1975), they explored the impact of a negative mood manipulation on social problem-solving ability, measuring relevant means and effectiveness of the problem-solving performance. Williams et al. (2005) found in a three-way group design, that among the two groups with a history of depression (one of which also had a history of suicide ideation), compared to the control group (who had no history of depression) only those people with a history of depression and suicide ideation showed significant decreases in social problem-solving after a mood induction. This suggests that even small changes in mood may reinstate cognitive deficits that are thought to contribute to the escalation of a suicidal crisis but only among those who had been previously suicidal. Specifically, this study found that it was effectiveness rather than the number of relevant means that was significantly more impaired following the mood induction.

8.2.4 Social problem-solving appraisal and skills

Social problem-solving appraisal is measured in this thesis by employing the SPSI-R. Reinecke, DuBois and Schultz (2001) examined the correlates of the subscales with depression and suicide ideation in an adolescent clinical sample, whereby they found significant correlations between all the subscales except RPS. The authors highlighted that the subscales of the SPSI-R may be differentially important in depression and suicide risk. Examining the differences in the specific components of the subscales could also be important when investigating problem-solving performance.

In the past, few studies have employed two measures of social problem-solving in general. What is more, House and Scott (1996) have argued that research should consider examining the relationship between problem-solving appraisal and problem-solving performance. This is particularly important as there is a dearth of research examining this relationship and specifically using the SPSI-R, however two studies have briefly explored this relationship whilst employing the Problem solving Inventory (PSI; Heppner & Peterson, 1982) and the MEPS.

In a case-control study with a clinical population of patients with and without a history of suicidal behaviour, Dieserud, Psychol, Roysamb, Ekeberg and Kraft (2001) found that the PSI was positively correlated with the MEPS. This finding is difficult to decipher, however, as the authors employed the total PSI score and the findings seem to suggest that poor appraisal of social problem-solving is positively associated with high problem-solving skills as assessed via the MEPS. In addition, this study further found that problem-

solving skills (MEPS) were negatively associated with suicide attempts. In a later longitudinal study, with a group of suicide attempters, Dieserud, Roysamb, Braverman, Dalgard, and Ekeberg (2003) also employed the MEPS and the PSI. The findings of this latter study found a tentative negative relationship between the two measures, although importantly, this was not significant. This study reported no other significant relationships with the MEPS. It is worthy of note, however, that the authors employed a composite measure of the PSI.

In summary, the differential activation theory of suicidality (Williams et al., 2008) posits that the experience of suicidal ideation or behaviour during a depressive episode increases the likelihood that it will re-emerge during subsequent episodes. Studies have found that inducing negative mood increases feelings of defeat (Goldstein & Willner, 2002), that defeat can impair memory (Johnson et al., 2008) and that mood impairs social problem-solving (Williams et al., 2005). Therefore, it seems logical to investigate the effect of inducing defeat on social problem-solving ability.

This study extends the Williams et al. (2005) study by specifically examining the effect of defeat on social problem-solving. If small changes in mood over time reinstate cognitive deficits that contribute to poorer problem-solving ability it seems reasonable to extend this to see if defeat can also reinstate those same cognitive deficits. Defeat and social problem-solving are also key within this thesis as we are investigating the role of social problem-solving more broadly within the IMV model. Within the IMV model, social problem-solving is posited to act as a threat to self moderator (TSM) which increase the risk of increased feelings of defeat leading to perceptions of no escape.

In addition to investigating the relationship between social problem-solving and defeat using a defeat manipulation task, this study also investigates the relationship between actual problem-solving performance (on the MEPS) with orientation and style (SPSI-R). By employing the SPSI-R the subscales of this measure enable an investigation into the relationship between the different types of social problem-solving.

8.2.5 Study Aims

This study, therefore, aims to investigate the relationship between different dimensions of social problem-solving, self-harm and established correlates of suicidality. It also aims to investigate whether social problem-solving is affected by defeat.

8.2.6 Research Questions (RQ) and hypotheses

Following the results from Chapter 3 and Chapter 5 as well as the literature reviewed herein the following research questions and hypotheses were formulated.

RQ 1. Are the dimensions of social problem-solving assessed via the SPSI-R, associated with problem-solving effectiveness, the number of relevant means, defeat and entrapment?

Although we are primarily interested in the dysfunctional subscales, given that negative problem orientation (NPO) was found to be the most pernicious problem-solving subscale in Chapter 5, in the interests of completeness we also investigated the positive/adaptive subscales in this study. Specifically, we hypothesised that:

Hypothesis 1. NPO, impulsive careless style (ICS) and avoidance (AS) would be significantly negatively associated with the number of relevant means at baseline, however, the relationship between the number of relevant means (post induction) and NPO, ICS and AS would be stronger after the defeat induction. In addition it was hypothesised that NPO, ICS and AS would be significantly negatively associated with problem-solving effectiveness at baseline, however, the relationship between problem-solving effectiveness (post induction) and NPO, ICS and AS would be stronger after the defeat induction (hypothesis 2). Finally, it was hypothesised that NPO, ICS and AS would be significantly associated with defeat and entrapment (hypothesis 3).

RQ 2. Do individuals who report self-harm history differ in social problem-solving than those with no self-harm history?

Given that Chapter 5 only found a difference with NPO between individuals who reported self-harm and those with no self-harm history and as this was inconsistent with other previous research we further hypothesised that individuals who report self-harm would report higher levels of NPO, ICS and AS than those with no self-harm history (hypothesis 4). It was also hypothesised that individuals who reported self-harm would be higher in levels of stress, depression, defeat, entrapment and suicide ideation (hypothesis 5). Furthermore, we hypothesised that individuals with a self-harm history would report fewer relevant means (hypothesis 6) and be poorer in social problem-solving effectiveness (hypothesis 7) than those individuals with no history of self-harm before and after a defeat-inducing task.

RQ 3. Is social problem-solving performance (in terms of the number of appropriate means and overall effectiveness) adversely affected by the experimental manipulation of defeat and is the effect most marked in the self-harm group?

Based on the findings of Williams et al. (2005) we hypothesised that those in the defeat condition would exhibit less relevant means than those in the control condition and this effect would be most marked in the self-harm group (hypothesis 8) after the defeat induction and that those in the defeat condition would exhibit poorer social problem-solving performance than those in the control condition (hypothesis 9) after the defeat induction and this effect would be most marked in the self-harm group.

8.3 Method

8.3.1 Design

This was a mixed factor study design, with two between group factors, no self-harm and self-harm group and two within group factors, no defeat manipulation and defeat manipulations. The study comprised of two parts, part one was completed on-line and part two was experimental and involved participants having face-to-face contact with the researcher.

8.3.2 Participants

Student participants were recruited through an on-line system used by the Psychology Department at the University of Glasgow. General population participants were recruited via on-line adverts on the website Gumtree. All participants who participated in part 1 were entered into a prize draw for an £25.00 Amazon gift voucher; participants who completed both parts were entered into the prize draw and awarded £10 in payment for their time. Ethical approval was granted from the University ethics committee.

A total of 75 participants were recruited who completed both parts of the study. This was a participant group (self-harm versus no self-harm) by defeat manipulation (defeat versus no defeat) by time (pre-versus post manipulation) study design. In essence this yielded four groups of participants. Groups 1 and 2 were control groups with group 1 (n=20) being the control condition (receiving no-defeat manipulation) and group 2 (n=20) was the defeat condition. Groups 3 and 4 were the self-harm groups, with group 3 (n=15) being the control condition (receiving no-defeat manipulation) and group 4 being the defeat condition (n=20).

8.3.3 Measures

8.3.3.1 Social Problem-Solving

The Social Problem-Solving Inventory–Revised: Short Form (SPSI-R: SF; D'Zurilla, Nezu & Maydeu-Olivares, 2002) is a 25-item self-report questionnaire with five sub- scales each of which is designed to tap into one of the five constructs that form the theoretical model of social problem-solving (D'Zurilla & Nezu, 1990; see appendix 1). Those are: Positive Problem Orientation (PPO; 'Whenever I have a problem I believe it can be solve'); Negative Problem Orientation (NPO; 'I feel threatened and afraid when I have an important problem to solve'); Rational Problem Solving (RPS; 'when I have a decision to make, I try to predict the positive and negative consequences of each option'); Impulsivity/ Carelessness Style (ICS; 'When I am trying to solve a problem I go for the first good idea that comes to mind') and Avoidance Style (AS; 'I wait to see if a problem will resolve itself first, before trying to solve it myself'). Items were designed to reflect cognitive, affective or behavioural responses to real-life social problem-solving situations. Participants are asked to rate the extent to which each statement is true on a five-point Likert-type scale (0 = not at all true of me to 4 = extremely true of me). Internal consistency in the present sample was PPO Cronbach's α = .73; PPO Cronbach's α = .73; NPO Cronbach's α = .84; RPS Cronbach's α = .67; ICS Cronbach's α = .79 and AS Cronbach's α = .86.

8.3.3.2 Stress

The Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983; see appendix 7) was developed to provide a measure of stress appraisal, specifically, the extent to which an individual perceives life as outwith their control, unpredictable and demanding. The PSS is a 14-item measure of global self-appraised stress (e.g. 'Felt that things were going your way') Participants indicated how they had been feeling over a specified period of time on a five-point scale ranging from 0 (never) to 4 (very often). Higher scores indicate greater levels of perceived stress. A shorter, 4-item, version of the PSS (Cohen et al., 1983) is also available and was used in this study (items 2, 6, 7 and 14). Items 6 and 7 are reverse scored. Predictive validities and internal and test-retest reliabilities of the scale have been established as good (Cohen, et al., 1983). Internal consistency in the present sample was Cronbach's α = .83.

8.3.3.3 Depression

The Beck Depression Inventory-II (BDI-II, Beck et al., 1996; see appendix 9) was used as a self-report measure of depression. It is a 21 question self-report inventory; each with four possible responses and each answer can be scored on a value of 0 to 3. The 21 items assess how an individual has been feeling in the last two weeks. The sum of all the BDI scores indicates the severity of the depression. The maximum score is 63. This measure has been found to yield internally consistent and valid scores (Dozois, Dobson & Ahnberg, 1998). Internal consistency in the present sample was Cronbach's $\alpha = .94$

8.3.3.4 Defeat

Defeat is conceptualised as sensitivity to environmental cues that signal defeat, and which give rise to an overpowering feeling of needing to escape. Feelings of defeat were measured using the Defeat Scale (Gilbert & Allan, 1998; see Appendix 4). This is a 16 item self-report measure of perceived failed struggle and loss of rank (e.g. 'I feel defeated by life'). Respondents indicated on a five point Likert-type scale the extent to which each item described their feelings (0 = not at all to 4 = extremely). Items 2, 4 and 9 on the scale are reverse scored and total scores are then calculated with higher scores indicating high levels of defeat. This scale has been found to have good psychometric properties and significantly correlates with depression (Gilbert & Allan, 1998; Gilbert, Allan & Brough, 2002). Internal consistency in the present sample was Cronbach's $\alpha = .95$

8.3.3.5 Entrapment

Entrapment represents the sense of being unable to escape the feeling of defeat and rejection, and is measured by the Entrapment Scale (Gilbert & Allan, 1998; see appendix 5). This is a 16-item measure of entrapment, which includes two subscales: internal entrapment (perception of entrapment by one's own thoughts and feelings: e.g., 'I feel powerless to change myself'; 6 items) and external entrapment (perceptions of entrapment by external situations: e.g., 'I feel trapped by other people'; 10 items). Respondents indicated on a five point Likert-type scale the extent to which each item described their feelings (0 = not at all to 4 = extremely). This scale has been found to have good psychometric properties by Gilbert and Allan (1998). Internal consistency in the present sample was Cronbach's $\alpha = .95$

8.3.3.6 Suicide Ideation

Suicide ideation was also assessed using the Beck Scale for Suicidal Ideation (BSSI; Beck & Steer, 1993; see appendix 11). This is a well-established 21-item scale measuring suicidal thinking over the preceding seven days. Items are scored 0 to 2, for example, 'I have no desire to kill myself '(0) to 'I have a moderate to strong desire to kill myself '(2). The self-report version of the scale has good concurrent validity and internal consistency (Luxton, Rudd, Reger & Gahm, 2011). Internal consistency (Cronbach's α) in the present sample was .88.

8.3.3.7 Self-harm

Self-harm was recorded if a respondent answered yes to the following question 'have you ever deliberately taken an overdose (e.g., pills or other medication) or tried to harm yourself in some other way (such as cut yourself)?' If participants answered yes to this item they were then asked when they last self-harmed.

Participants were also asked four questions to determine whether they had ever engaged in/or seriously thought about self-harm.

1. 'Have you ever seriously thought of taking your life, but not actually attempted to do so?'

2. 'Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?'

3. 'Have you ever seriously thought about trying to deliberately harm yourself but not with the intention of killing yourself and not actually done so?'

4. 'Have you ever deliberately harmed yourself in any way but not with the intention of killing yourself?'

These questions have been widely used in a range of other studies (e.g., O'Connor, Rasmussen, & Hawton, 2012).

8.3.3.8 Social problem-solving performance

Participants were presented with problem scenarios on cards and simultaneously read aloud by the experimenter. Each scenario outlined an initial problem situation to be solved and then the solution to the problem. There were two sets of scenarios, set A comprising of scenarios 1,3,5,7 and 9 and set B comprising of scenarios 2,4,6,8 and 10.

8.3.4 Materials

8.3.4.1 Visual Analogue Scale (VAS) mood rating

Participants were asked to rate their mood on three 100mm Visual Analogue scale (VAS; see Appendix 13) at five different points throughout the study for each rating the statement 'at this moment I feel….' was printed above the line and either 'defeat', 'happy' or 'sad' was printed below the line, anchored on a scale of 'not at all' to 'extremely' (consistent with Johnston et al. 2008). The five occasions were, once before the first set of MEPS-R scenarios (set A or B), then after the first set of scenarios, once before the mood induction and then again after the negative mood induction and then at the end of the study after the positive mood induction.

8.3.4.2 Puzzle to Induce Defeat or Success

Participants were randomised into either an experimental (defeat) condition, or a control (no defeat) condition using a web-based randomiser programme to allocate participants into each condition. Defeat/no defeat was induced following procedures adapted from Pegg, Deakin, Anderson and Elliott (2006) by Johnson et al. (2008).

Both manipulations were comprised of two 30 trial computerised tasks (anagrams) which run on e-prime software. There were two versions of the task, one impossible and one achievable version. Participants in the defeat (experimental) condition received the impossible version of the tasks and those in the no defeat (control) condition receive the achievable version.

In the anagram task, participants were required to form new words using all the letters in the target word (e.g. 'room' could be created from 'moor'). There were two versions of the task, one impossible and one achievable version. Each task contains 30 trials, and in the impossible version, seven of these were unsolvable. The pass rate was set at 23 and participants were encouraged to score above this. The achievable version contains 23 of the trials from the impossible version, but in place of the impossible trials it includes seven trials that were highly achievable, and the pass rate was set at 15.

8.3.4.3 Positive mood induction

This was a series of clips that was edited to show a ten-minute video to participants. This video was developed by colleagues at Harvard University for use in another mood induction study (personal correspondence with the project managers). Clips in the video

included animals, children and adults all involved in some event that can be construed as 'funny'. The aim of the induction was to induce positive feelings in participants following the defeat induction.

8.3.5 Procedure

This study received ethical approval from the University of Glasgow's ethics department before participants were recruited. This was a two-part study (see Figure 8.1), part one was on-line using a remote access website where participants were required to complete the following measures: The Beck Depression Inventory (BDI-II; 1996); Beck Suicide ideation Scale (BSSI; Beck); Defeat Scale (Gilbert & Allan, 1998); Entrapment Scale (Gilbert & Allan, 1998); The Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983); The Social Problem-Solving Inventory–Revised: Short Form (SPSI-R: S; D'Zurilla, Nezu & Maydeu-Olivares, 2002). In addition, participants were asked four questions to determine if they had ever engaged in self-harm or seriously thought about self-harm. The responses to those questions determined whether participants were allocated to the no self-harm group or the self-harm group. Participants were allocated a unique identifying number on an excel sheet and place in either the no self-harm or the self-harm group.

A web-based randomiser was used to identify participants to be in either the defeat or no defeat manipulation group in part two. Participants were invited into the University to complete a series of tasks; Figure 8.1 shows the procedure of this study. After completing an information and consent form, participants were asked to rate their mood at Time 1, three times using the VAS. Participants then completed either set A or set B of the MEPS-R, they then filled in Time 2 of the VAS. The next task was either the defeat puzzle task where participants were randomised to either the defeat or no defeat condition, after the task participants completed Time 3 of the VAS. If participants completed set A of the MEPS-R they then went on to complete set B or vice versa, after which they completed Time 4 of the VAS. The final activity involved watching a series of video clips (positive mood induction) and then finished with Time 5 of the VAS. At the end of the study participants were fully debriefed and remunerated for their time.

Part 1: **Online questionnaire**	**Part 2: Experimental**
All participants complete the following measures.	Groups allocated into no self-harm or self-harm based on responses to part 1. Further allocation of either control or experimental condition allocated using a web-based randomiser.

| **Part 1:** **Online questionnaire** All participants complete the following measures. **Self-report measures:** Defeat Entrapment Social support Stress Social problem-solving Suicide ideation Self-harm Not all participants invited to complete part 2. | **NO SELF-HARM GROUPS** |

NO SELF-HARM GROUPS

Group 1/no defeat	**Group 2/defeat**
1st mood check	1st mood check
Set A or B of MEPS-R scenarios	Set A or B of MEPS-R scenarios
2nd mood check	2nd mood check
Possible puzzle task	Impossible puzzle task
3rd mood check	3rd mood check
2nd MEPS-R scenarios (if received set A first then will have set B or vice versa)	2nd MEPS-R scenarios (if received set A first then will have set B or vice versa)
4th mood check	4th mood check
Positive mood induction	Positive mood induction
5th mood check	5th mood check

SELF-HARM GROUPS

Group 3/No defeat	**Group 4/defeat**
1st mood check	1st mood check
Set A or B of MEPS-R scenarios	Set A or B of MEPS-R scenarios
2nd mood check	2nd mood check
Possible puzzle task	Impossible puzzle task
3rd mood check	3rd mood check
2nd MEPS-R scenarios (if received set A first then will have set B or vice versa)	2nd MEPS-R scenarios (if received set A first then will have set B or vice versa)
4th mood check	4th mood check
Positive mood induction	Positive mood induction
5th mood check	5th mood check

Figure 8.1: Procedural diagram of experimental study

8.3.6 Sample size

The aim was to recruit a total sample size of 80, 40 for the self-harm group and 40 in the no-self-harm group. The sample size was determined by reviewing related studies (Johnston et al, 2008). In addition a power analysis was conducted using G* power 3 computer software (Faul et al; 2007) with a medium effect size of .35, alpha setting of .05 and a power calculation of .95 this yielded a sample size of 70.

8.4 Results

8.4.1 Participant characteristics

A total of 75 participants were recruited with a total mean age of 25.43 years (SD = 8.36), range 18 years to 57 years. There was a total of 21 males, mean age 27.9 years (SD = 8.94), range 18 to 57 years and 54 females mean age 24.46 years (SD = 7.98), range 18 to 54 years. There was no significant difference between the groups in age t (73) = 1.62, ns.

The no self-harm group had a total of 40 participants with a mean age of 25.33 years (SD 8.76), age range 18 to 57 years with 12 males, mean age 29.58 years (SD = 10.99), range 18 to 57 and 28 females mean age 23.67 years (SD = 7.21), range 18 to 49 years. There was no significant difference in age between the males and females t (38) = 2.0, ns.

The no self-harm/no-defeat group had a total of 20 participants with a mean age of 24.65 years (SD = 9.54), range 18 to 57 years, with 6 males, mean age 31.67 years (SD = 13.85), range 50 to 57 years. There were 14 females with a mean age of 23.57 years (SD = 6.17), range 18 to 39 years. There was no significant difference between the groups in age t (18) = 1.37, ns.

The no self-harm/defeat condition group had a total of 20 participants with a mean age of 24.65 years (SD = 8.15), range 18 to 49 years, with 6 males, mean age 27.5 years (SD = 7.97) range 18 to 41 and 14 females, mean age 23.43 years (SD = 8.2), range 18 to 49 years. There was no significant difference between the groups in age t (18) = 1.05, ns.

The self-harm group had a total of 35 participants with a mean age of 25.54 years (SD = 7.96) age range 18 to 54 years with 9 males, mean age 25.67 years (SD = 4.87), range 18 years to 31 years and 26 females, mean age 25.5 years (SD = 8.86), range 18 years to 54 years. There was no significant difference between the groups in age t (33) = .05, ns.

The self-harm/no-defeat group had a total of 15 participants, mean age 25.87 years (SD = 4.69), range 19 to 32 years with 6 males, mean age 26.67 years (SD = 4.56), range 19 to 31 and 9 females, with a mean age of 25.33 years (SD = 5.02), range 19 to 32 years. There was no significant difference between the groups in age t (13) = .53, ns.

The self-harm/defeat condition group had a total of 20 participants with a mean age of 25.30 years (SD = 1.85), range 18 to 54 with 3 males, mean age 23.67 years (SD = 6.03), range 18 to 30 and 17 females with a mean age of 25.59 years (SD = 10.49), age range 18 to 54. There was no significant difference between the groups t (18) = -.30, ns.

The two participant groups (no self-harm versus self-harm) did not differ in terms of gender, χ^2 (1) = .17, ns, with 28 and 26 females in the no self-harm and self-harm group respectively, or age (M = 25.33, SD = 8.79 and M= 25.54, SD = 7.96 for the self-harm and control group respectively), t (73) = .112, ns.

8.4.2 Examining the relationship of the subscales of the SPSI-R

To investigate the relationship between the dimensions of social problem-solving assessed via the SPSI-R and the number of relevant means, effectiveness ratings, defeat and entrapment correlation analyses were conducted (see Table 8.1). Due to the large number of correlations a Bonferroni correction was carried out (.05/13) to adjust significance to .0038.

Hypothesis 1: It was hypothesised that NPO, ICS and AS would be significantly and negatively associated with means-end problem-solving at baseline, however, the relationship between means-end problem-solving (post induction) and NPO, ICS and AS would be stronger after the defeat induction.

The analyses revealed that NPO (r = -.33, ns), ICS (r = -.46, p < .001), and AS (r = -.23, .ns), were negatively associated with the number of relevant means at baseline, however, the relationships between the means-end problem-solving (post induction) and NPO(r = -.30, ns), ICS (r = -.24, ns) and AS (r = -.13, ns) were not stronger after the defeat induction.

Hypothesis 2: It was hypothesised that NPO, ICS and AS would be significantly and negatively associated with problem-solving effectiveness at baseline, however, the relationship between problem-solving effectiveness (post induction) and NPO, ICS and AS will be stronger after the defeat induction.

Only NPO (r = -.31, ns) and ICS (r = -.33, ns) were negatively associated with effectiveness ratings at baseline, however, the relationship post induction (r = -.26, ns and r = -.30, ns) was not stronger after the defeat induction.

Hypothesis 3: It was hypothesised that NPO, ICS and AS would be significantly associated with defeat and entrapment.

NPO, ICS and AS were found to be positively associated entrapment (r = .73, p < .001; r = .44, p < .001 and r = .47, p < .001) but only NPO and AS were positively associated with defeat (r = .70, p < .001 and r = .42, p < .001).

Table 8.1 Zero order correlations of all of the study measures

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. PPO	-													
2. NPO	-.54***	-												
3. RPS	.46***	-.09	-											
4. ICS	-.07	.47***	-.27	-										
5. AS	-.42***	.48***	-.34***	.48***	-									
6. STRESS	-.54***	.62***	-.23	.32***	.37***	-								
7. BDI-II	-.44***	.66***	-.13	.40***	.36***	.79***	-							
8. DEFEAT	-.54***	.70***	-11	.30	.42***	.65***	.90***	-						
9. ENTRAPMENT	-.50***	.73***	-.15	.44***	.47***	.81***	.85***	.88***	-					
10. BSSI	-.23	.45***	-.46	.28	.19	.42***	.67***	.65***	.61***	-				
11. T1 MEANS	.08	-.33	.16	-.46***	-.23	-.36***	-.38	-.33	-.38	-.39	-			
12. T2 MEANS	.16	-.30	.22	-.24*	-.13	-.32***	-.30	-.33	-.34	-.40	.49	-		
13. T1 EFFECT	.09	-.31	.04	-.33	-.21	-.38***	-.39	-.37	-.42	-.43	.90	.57	-	
14. T2 EFFECT	.13	-.26	.17	-.30	-.20	-.36***	-.42	-.40	-.43	-.52	.60	.87	.70	-

PPO: Positive problem orientation; NPO: Negative problem orientation; RPS: Rational problem-solving; ICS: Impulsive/careless problem-solving: AS: Avoidance style; BDI-II: Depression; BSSI: suicide ideation; T1 MEANS: means end problem solving scores; T2 MEANS: means end problem solving scores; T1 Effect: Effectiveness scores and T2 Effect: Effectiveness scores

Correlation is significant at ***p < .001

8.4.3 Testing the difference between the control and self-harm group in terms of social problem-solving and psychological distress

To test the next two hypotheses (4 & 5) the following section details a series of MANOVAs that was conducted to test that the hypotheses.

Hypothesis 4: Individuals who report self-harm would report higher levels of NPO, ICS and AS than those with no self-harm history and lower levels of PPO and RPS.

A one-way between groups MANOVA was performed to investigate the differences between individuals who report self-harm and those who do not on the social problem-solving subscales. There was a statistical significant difference between those who had reported self-harm and those who did not report self-harm on the combined dependent variables $F (5, 69) = 8.47$, $p <.001$; wilks lambda $= .62$. Next, the results for the dependent variables were considered separately, using a Bonferroni correction method (i.e., comparing the p values of the largest effect to alpha divided by the number of dependant variables (e.g., $.05/5 = .01$)). With an adjusted alpha level of .01 the only dependent variable that did not reach statistical significance was RPS. The other subscales were statistically significant PPO $F (1, 73) =17.33$, $p < .001$, partial eta squared $= .19$, NPO $F (1, 73) = 40.54$, $p < .001$, partial eta squared $= .36$, ICS $F (1, 73) =7.43$, $p =.008$ partial eta squared $= .09$ and AS $F (1, 73) = 9.71$, $p =.003$, partial eta squared $= .12$.

An inspection of the mean scores indicate that individuals who had a history of self-harm reported higher levels of NPO (M =6.48, SD =3.19 and M =12, SD =4.3 for the control and self-harm group respectively), ICS (M =4.9, SD =3.91 and M =7.4, SD =4.02 for the control and self-harm group respectively), and AS (M =5.4, SD =3.83 and M =8.6, SD =5.04 for the control and self-harm group respectively), than those with no history of self-harm.

Individuals who reported self-harm were also lower on PPO (M =11.6, SD =3.54 and M =8.2, SD=3.52 for the control and self-harm group respectively), compared to those in the no self-harm group. However, there was no significant difference between the control and self-harm groups for RPS (M =10.85, SD =3.81 and M =9.51, SD =4.07 for the control and self-harm group respectively).

A one-way between groups multivariate analysis of variance was performed to investigate the differences between gender on the social problem-solving subscales. There was no statistical significant difference between males and females on the combined dependent variables F (5, 68) = 1.68, p ns; wilks lambda = .79.

Hypothesis 5: Individuals who reported self-harm would report higher levels of stress, depression, defeat and entrapment than those who do not report self-harm.

A one-way between groups MANOVA was performed to investigate the differences between individuals who report self-harm and those who do not on psychological distress variables. There was a statistical significant difference between those who had reported self-harm and those who did not report self-harm on the combined dependent variables F (5, 69) = 7.3, p <.001; wilks lambda = .65. Next, the results for the dependent variables were considered separately (using a Bonferroni correction method which involved comparing the p values of the largest effect to alpha divided by the number of dependant variables (e.g., .05/5 = .01)). With an adjusted alpha level of .01 all of the dependent variables reached statistical significance, stress F (1, 73) =27.1,p < .001, partial eta squared = .27, depression F (1, 73) = 31.94, p < .001, partial eta squared = .30, defeat F (1, 73) =29.92, p <.001 partial eta squared = .29, entrapment F (1, 73) =35.43, p <.001 partial eta squared = .33 and suicide ideation F (1, 73) = 10.72, p =.003, partial eta squared = .13.

Table 8.2 Mean and SD scores for the control and self-harm groups on key study variables

Variable	Control		Self-harm	
	M	SD	M	SD
PPO	11.6	3.54	8.2***	3.52
NPO	6.48	3.2	12.0***	4.28
RPS	10.85	3.81	9.51	4.07
ICS	4.9	3.9	7.4**	4.02
AS	5.4	3.8	8.6**	5.04
Stress	6.05	2.91	9.4***	2.61
Depression	11.4	9.17	26.49***	13.75
Defeat	12.75	6.71	23.77***	10.53
Entrapment	10.3	12.41	29.20***	15.08
Suicide ideation	.48	1.2	2.03**	2.71

PPO: positive problem orientation; NPO: negative problem orientation; RPS: rational problem-solving; ICS: impulsive/careless problem-solving and AS: avoidance style

* p < .05; ** p < .01; *** p < .001Significant difference between the groups

To test hypotheses 6 and 7, in the next section a series of t-tests were conducted to compare those with and without a self-harm history.

Hypothesis 6: It was hypothesised that individuals who reported self-harm would report fewer relevant means than those with no history of self-harm before and after a defeat induction task.

Individuals who did not report self-harm reported marginally more relevant means at T1 (M = 16.3, SD = 4.33) than the self-harm group at T1 (M = 14.36, SD = 3.53), however the difference was not significant $t(73)$ =2.00, ns.

At T2, individuals who did not report self-harm reported more relevant means (M = 15.88, SD = 4.76) than those in the self-harm group at T2 (M = 13.69, SD = 4.75), $t(73)$ = 1.99, p = .05.

Hypothesis 7: It was hypothesised that individuals who reported self-harm would report less effective means than those with no history of self-harm before and after a defeat induction task.

Individuals who did not report self-harm reported higher scores in effectiveness at T1 (M = 25.95, SD = 4.22) than the self-harm group at T1 (M = 24.2, SD = 2.98). The difference was significant $t(73)$ =2.09, p = .04.

Individuals who did not report self-harm reported higher scores in effectiveness at T2 (M = 25.50, SD = 4.38) than the self-harm group at T2 (M = 23.77, SD = 4.07), however the difference was not found to be significant $t(73)$ =1.76, p = ns.

8.4.4 Manipulation Check: Visual Analogue mood ratings
To investigate whether the defeat manipulation induced defeat, the following analyses were conducted. Although the aim was to monitor changes in defeat, the effect of the defeat manipulation on happiness and sadness was also investigated. To this end, Figure 8.2 shows changes in the participants' ratings of defeat, Figure 8.3 shows sadness ratings and figure 8.4 shows the participants' happiness ratings. The specificity of the defeat/control manipulation was investigated using three ANOVAs, to test for changes in each of the ratings for defeat, sad and happy across the study. First a group (defeat vs

control manipulation) by time (pre-defeat/control manipulation, post-task completion) ANOVA was conducted on the VAS defeat ratings. This yielded a main effect of time, F $(2, 72) = 30.65$, $p < .001$, $\eta^2_{p} = .46$ and a significant time by group interaction, F $(2, 72) = 12.05$, $p < .001$, $\eta^2_{p} = .25$. As anticipated, following the defeat manipulation there was a significant difference ($p < .001$) in the defeat ratings between the two groups (control vs defeat manipulation) (see Figure 8.2).
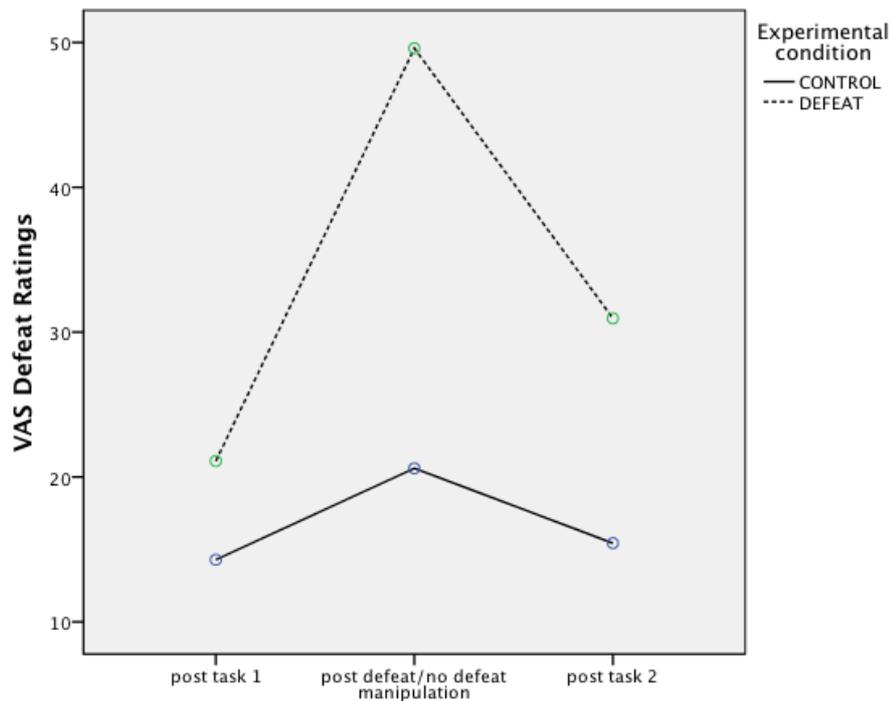
Figure 8.2: Visual analogue scale (VAS) ratings for defeat

A second group (defeat vs control manipulation) by time (pre-defeat/control manipulation, post defeat/control manipulation and a post-task completion) ANOVA was conducted on the VAS sad ratings. This yielded a main effect of time, F $(2, 72) = 3.42$, $p = .038$, $\eta^2_{p} = .087$ and a significant time by group interaction, F $(2, 72) = 5.49$, $p = .006$, $\eta^2_{p} = .132$. Following the defeat manipulation there was a significant difference ($p = .025$) in sadness for the two groups (control vs defeat manipulation) (see Figure 8.3).
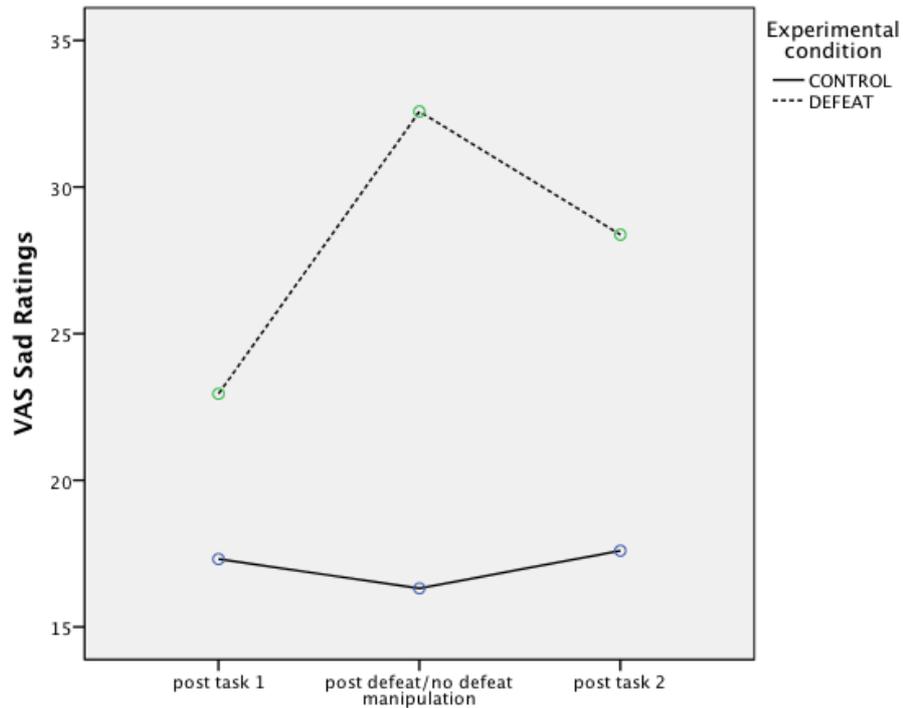
Figure 8.3: Visual analogue scale (VAS) ratings for sadness

A third a group (defeat vs control manipulation) by time (pre-defeat/control manipulation, post defeat/control manipulation and a second defeat/control manipulation) ANOVA was conducted on the VAS happy ratings. This did not yield a main effect of time, $F(2, 72) = 2.85$, *ns*, $\eta^2_p = .073$ but did yield a significant time by group interaction, $F(2, 72) = 4.58$, $p = .013$, $\eta^2_p = .11$. Following the defeat manipulation there was a significant difference ($p < .001$) in happiness ratings for the two groups (control vs defeat manipulation) (see Figure 8.4).
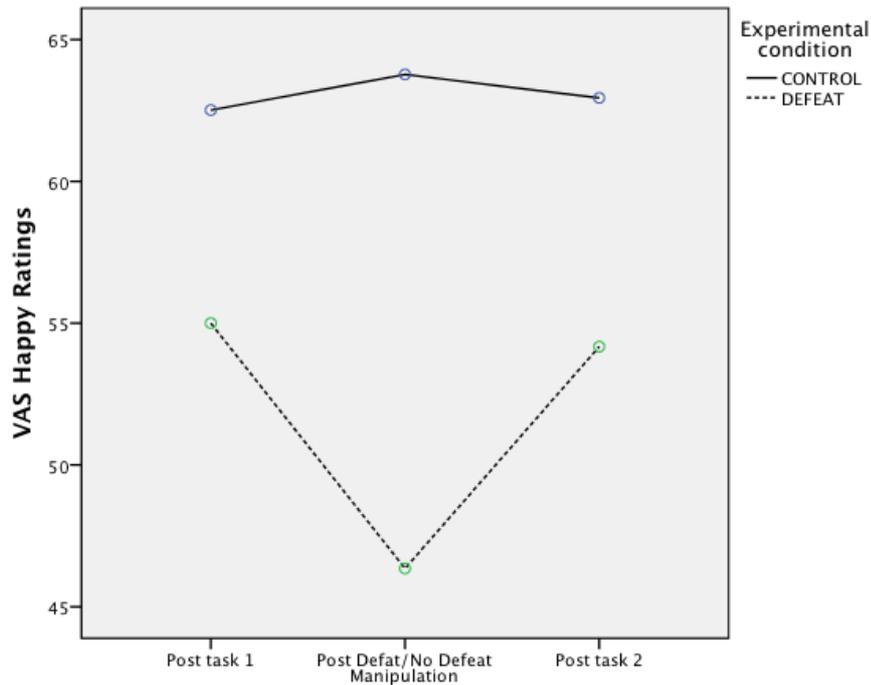
Figure 8.4: Visual analogue scale (VAS) ratings for happiness

To address, the third research question (Is social problem-solving performance (in terms of the number of relevant means and overall effectiveness) adversely affected by the experimental manipulation of defeat that any decrement in problem-solving would be most marked in the self-harm group?), a series of mixed measures ANOVAs were conducted.

8.4.5 Testing hypothesis 8 and 9 investigating the effect of defeat on social problem-solving

8.4.5.1 Number of relevant means

Hypothesis 8: It was hypothesised that individuals in the defeat condition would exhibit less relevant means than those in the control condition after the defeat induction and this effect would be most marked in the self-harm group.

Table 8.3 Means and SD for the number of relevant means by groups and conditions at T1 and T2

T1 MEPS	Group	Condition	Mean	SD
	Control	Control	16.25	3.95
		Defeat	16.35	4.78
	Self-harm	Control	13.8	2.65
		Defeat	14.95	4.07
T2 MEPS	Group	Condition	Mean	SD
	Control	Control	15.50	4.81
		Defeat	16.25	4.79
	Self-harm	Control	13.27	4.24
		Defeat	14.0	5.17

A mixed measures ANOVA was conducted to examine the effect of the manipulation (defeat versus no-defeat condition) on the number of relevant means as a function of study group (i.e., self-harm or control). This analysis yielded no main effect for time, $F(1, 71) = 1.17$, ns, $\eta^2_p = .016$, thereby suggesting that the participants did not produce significantly less relevant means (compared to pre-manipulation) following the manipulation.

There was also no significant interaction between time and condition $F(1, 71) = 0.087$, ns, $\eta^2_p < .001$, nor time and group $F(1, 71) = .012$, ns, $\eta^2_p < .001$. This indicates that participants responded similarly to the defeat/no defat manipulation.

To investigate any trends in the data, an inspection of the relevant mean scores of the control group in the defeat condition indicates that the means scores were very slightly higher (16.35; SD = 4.78) before the defeat manipulation and lower (16.25; SD = 4.79) after the defeat manipulation showing that there was a very slight reduction in the number of relevant means (albeit not significant). Before the defeat manipulation the effectiveness scores were 14.95 (SD = 4.07) and after they were 14.0 (SD = 5.17), again a slight decrease in the number of relevant means (again not significant).
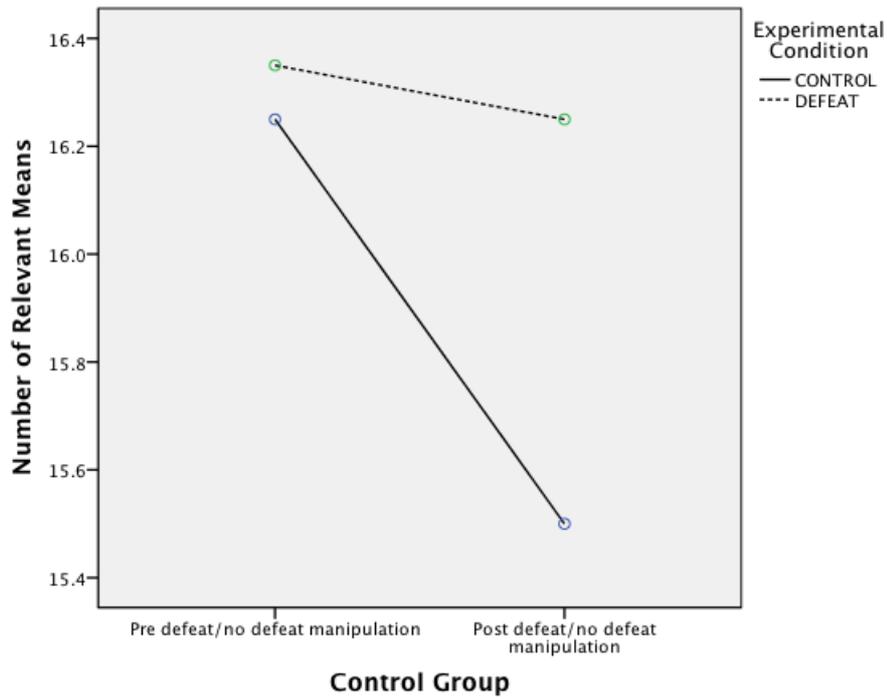
Figure 8.5: The number of means reported in the Means-End Problem-Solving task pre- and post-defeat manipulation/no defeat manipulation for control group.
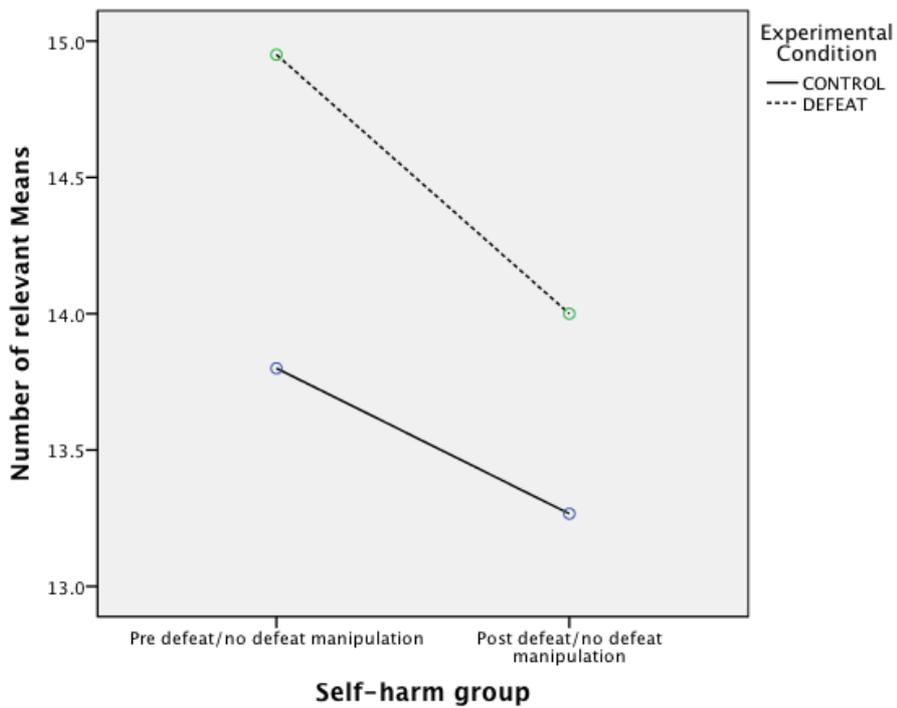
Figure 8.6: The number of means reported in the Means-End Problem-Solving task pre- and post-defeat manipulation/no defeat manipulation for self-harm group.

Figures 8.5 and 8.6 (and Table 8.3) show the number of means reported pre and post task for the control group (Figure 8.5) and the self-harm group (Figure 8.6). There was no significant interaction found and these figures are not included for information purposes only.

8.4.5.2 Problem-solving effectiveness

It was hypothesised that individuals in the defeat condition would exhibit poorer social problem-solving effectiveness than those in the control condition after the defeat induction and this effect would be most marked in the self-harm group (hypothesis 9).

The mean effectiveness scores for each of the four groups at T1 and T2 effectiveness are detailed below in Table 8.4.

Table 8.4 Means and SD for separate groups and conditions at T1 and T2 Effectiveness.

T1 Effectiveness	Group	Condition	Mean	SD
	Control	Control	26.00	4.56
		Defeat	25.90	3.97
	Self-harm	Control	23.40	2.29
		Defeat	24.20	3.33
T2 Effectiveness	Group	Condition	Mean	Mean
	Control	Control	25.55	4.72
		Defeat	25.45	4.12
	Self-harm	Control	23.87	3.56
		Defeat	23.70	4.49

A mixed measures ANOVA was conducted to examine the effect of the manipulation (defeat versus no-defeat condition) on the effectiveness of the problem-solving solutions as a function of study group (i.e., self-harm or control). This analysis yielded no main effect for time $F (1, 71) = 1.09$, ns, $\eta^2_p = .015$, thereby suggesting that participants did not produce significant less effective means (compared to pre-manipulation) following the manipulation.

There was also no significant interaction between time and condition $F (1, 71) = 1.134$, ns, $\eta^2_p < .016$, nor time and group $F (1, 71) = .033$, ns, $\eta^2_p < .001$. This indicates that participants responded similarly to the defeat/no defeat manipulation.

Means scores by group were eyeballed to investigate any potential non-significant trends. An inspection of the effectiveness mean scores for the control group in the defeat condition

indicates that the means scores were very slightly higher (25.90; SD = 3.97) before the defeat manipulation and lower (25.45; SD = 4.12) after the defeat manipulation showing that there was a very slight reduction in effectiveness of solutions. The self-harm group before the defeat manipulation effectiveness scores were 24.80 (SD = 3.33) and after were 23.70 (SD = 4.49), again a slight decrease in the effectiveness of solutions.
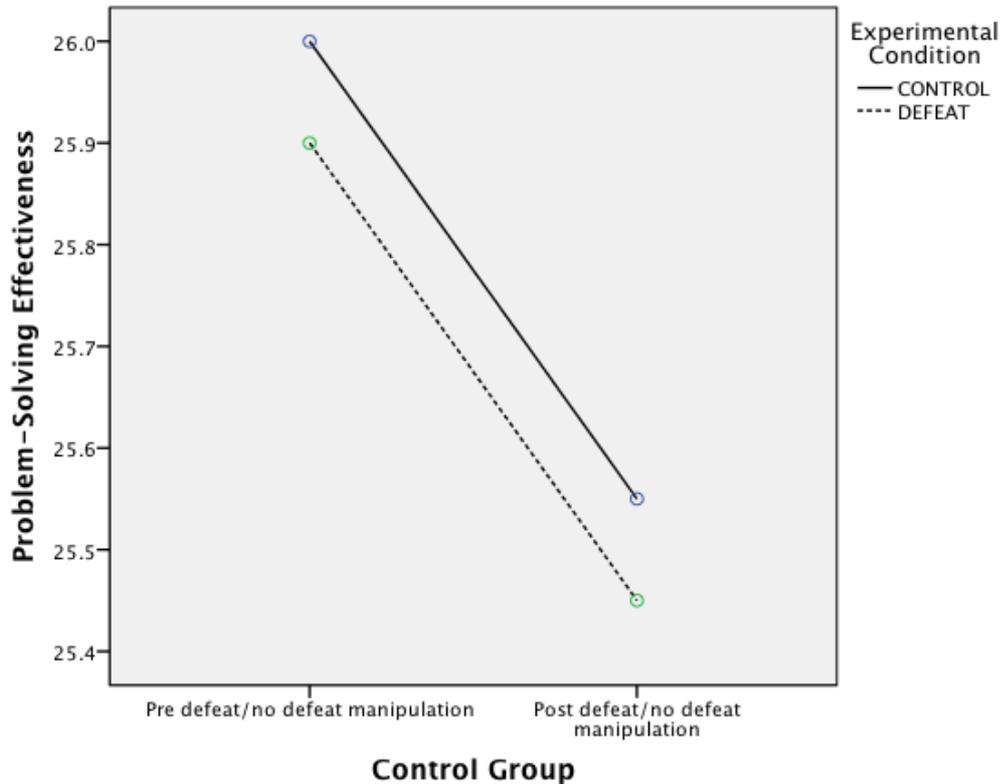
Figure 8.7 Mean Means-End Problem-Solving task problem-solving effectiveness pre and post defeat manipulation/no defeat manipulation for control group.
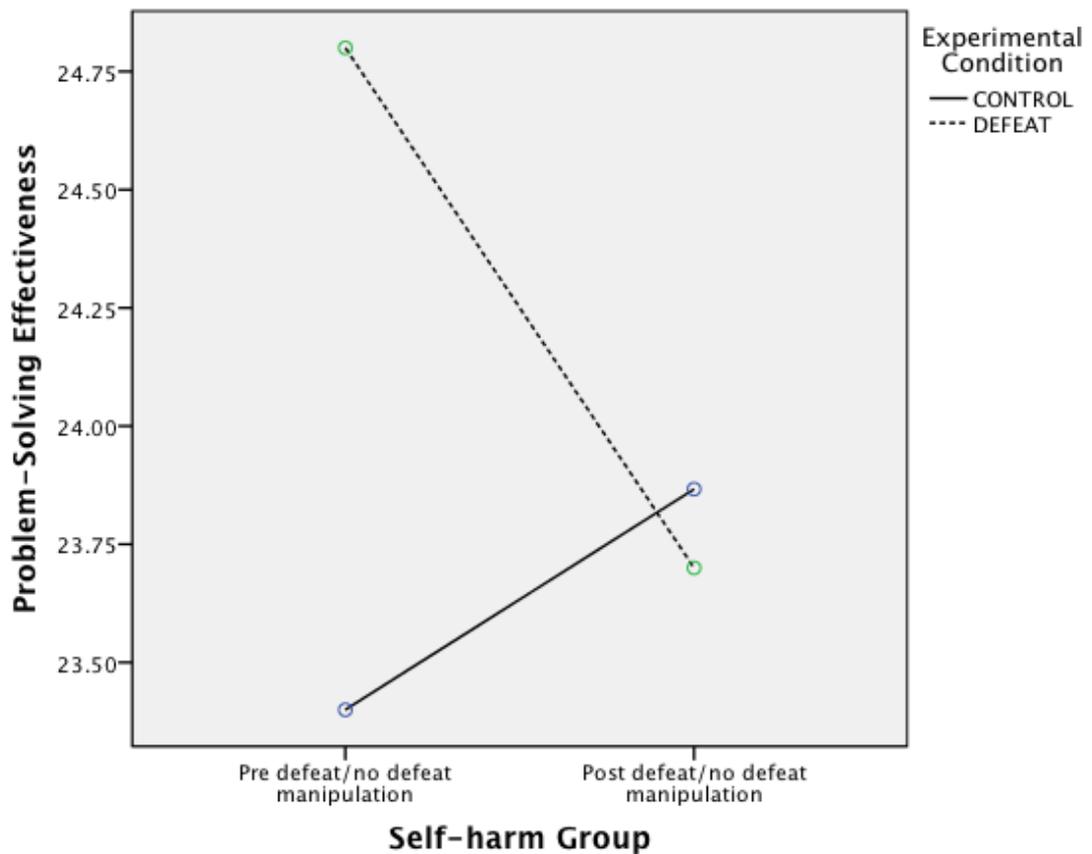
Figure 8.8: Mean Means-End Problem-Solving task problem-solving effectiveness pre and post defeat manipulation/no defeat manipulation for self-harm group.

Figures 8.7 and 8.8 (and Table 8.4) shows problem-solving effectiveness reported pre and post task for the control group (Figure 8.7) and the self-harm group (Figure 8.8). As noted above, there was no significant interaction found.

Influence of baseline variables on the defeat/no defeat manipulation

To investigate whether the manipulation was affected by baseline variables, a series of ANCOVAs was also conducted covarying suicide ideation, depressive symptoms, defeat and entrapment. As the inclusion of these covariates did not alter the pattern of initial findings, in the interests of parsimony, only the original AVOVAs for the numbers of relevant means and effectiveness are presented.

8.4.6 Summary

The first research question examining the relationship between the social problem-solving constructs and means end thinking yielded mixed results. NPO, ICS and AS were all significantly associated with the number of relevant means at T1 and T2, although the

relationship did not strengthen at T2. Problem-solving effectiveness was only found to be significantly associated with NPO at T1 and T2 but again this relationship did not strengthen after a defeat manipulation. The only subscale of social problem-solving that was not significantly associated with psychological distress was RPS.

The second research question was concerning with the differences between those participants who reported self-harm versus those who did not on the social problem-solving subscales. This study found a significant difference between the self-harm and control groups on all of the social problem-solving subscales as well as the expected differences on measures of psychological distress.

For the purposes of RQ 2 when comparing individuals who reported self-harm with those who did not on the number of means before and after a defeat manipulation there was a significant difference between the groups after the defeat manipulation. However, this was not found for the effectiveness ratings whereby there was only a significant difference before the defeat manipulations task.

Finally, in terms of RQ 3, the defeat manipulations had no impact on either of the participant groups in the number of relevant means or effectiveness ratings.

8.5 Discussion

The current study had three research questions, which were (i) are the dimensions of social problem-solving, assessed via the SPSI-R, associated with problem-solving effectiveness, means-end problem-solving, defeat and entrapment? (ii) Do individuals who report self-harm history differ in social problem-solving than those with no self-harm history? And (iii) is social problem-solving performance (in terms of the number of appropriate means and overall effectiveness) adversely affected by the experimental manipulation of defeat and that any decrement in problem-solving would be most marked in the self-harm group? These questions were answered specifically by addressing the nine-study hypotheses.

In the following section the results are summarised (see Table 8.5) together with an appraisal of whether the findings support the study hypotheses and how they relate to

previous research. Although hypothesis 1 was only partially supported there were significant relationships between NPO, ICS and AS and the number of relevant means at baseline, although the relationship between NPO and ICS and the latter were not stronger after the defeat induction. In respect of hypothesis 2, NPO was the only subscale to be significantly associated with problem-solving effectiveness, and again this relationship was not strengthened by the defeat-induction as hypothesised. Hypothesis 3 was fully supported showing a significant relationship between dysfunctional social problem-solving, defeat and entrapment.

The fourth and fifth hypotheses examined the differences between individuals who reported self-harm and those with no history of self-harm in relation to dysfunctional problem-solving and psychological distress. The only variable outlined in hypothesis 4 that was not significantly different between the groups was RPS, there were significant differences between the groups for all the other subscales of the SPSI-R. The findings also fully supported the fifth hypothesis, with self-harmers scoring higher on levels of stress, depression, defeat, entrapment and suicide ideation than those without a self-harm history.

Partial support was also found for hypotheses 6 and 7, whereby individuals who reported self-harm reported fewer relevant means than those who did not report self-harm both before the defeat induction and after the defeat-inducing task (hypothesis 6). The findings were only significant at T2, however there was a significant difference at T1. The findings were also partially supportive for hypothesis 7, as individuals who reported self-harm scored lower in problem-solving effectiveness before the defeat-inducing task and after the defeat-inducting task, however these scores were only significantly different at T1. The final two hypotheses (8 and 9) were not supported.

Table 8.5 Summary of study hypotheses and results

	Hypotheses	**Summary Findings**
1	NPO, ICS and AS will be significantly negatively associated with means-end thinking at baseline, however, the relationship between means-end problem-solving (post induction) and NPO, ICS and AS will be stronger after the defeat induction.	Partial
2	NPO, ICS and AS will be significantly negatively associated with problem-solving effectiveness ratings at baseline, however, the relationship problem-solving effectiveness (post induction) and NPO, ICS and AS will be stronger after the defeat induction.	NO
3	NPO, ICS and AS will be significantly associated with defeat and entrapment	Fully
	Individuals who report self-harm will exhibit:	
4	Higher levels of NPO, ICS and AS and lower levels of PPO and RPS than those with no self-harm history.	Partially (All except RPS)
5	Higher levels of stress, depression, defeat, entrapment and suicide ideation than those who do not report self-harm	Fully
	Compared to those with no self-harm history, individuals who report self-harm will exhibit:	
6	Fewer means before (T1) and after (T2) a defeat induction, however the differences in means between those with and without a self-harm history will be greater after the defeat-induction.	Partial
7	Less effective solutions than individuals who do not report self-harm before (T1) and after (T2) a defeat-induction, however the difference in effectiveness between those with and without a self-harm history will be greater after the defeat-induction.	Partial
	Compared to those in the control condition, individuals in the defeat condition will exhibit:	
8	Less means than those in the non-defeat condition at T2.	NO
9	Less effective means than those in the non-defeat condition at T2.	NO

8.5.1 Examining the relationship of the subscales of the SPSI-R

It was predicted (hypothesis 1) that NPO, ICS and AS would be significantly associated with the number of relevant means and the relationship would be stronger after the defeat inducing task. Only ICS was found to be significantly correlated with the number of relevant means at base-line and non of the subscales were significantly correlated after the defeat induction task, however, this relationship was weaker not stronger as had been predicted. These findings seem to suggest that heightened perceptions of defeat have no impact on social problem-solving orientation or skills. As Johnson et al. (2008) found that perceptions of defeat affected memory, which is well documented to be associated with social problem-solving (Williams et al., 2005) the present findings may suggest that defeat has a very specific effect on cognitions (e.g., memories) but that this effect does not extend to social problem-solving appraisal. Importantly though, these results do show that there is a relationship between dysfunctional problem-solving and problem-solving ability, to this end, this result extends previous research (Dierserud, et al., 2001). These authors found a relationship between a composite score of social problem-solving and means end thinking, whereas this study has established that it is primarily dysfunctional problem-solving that is key to this relationship. Taking these findings as a whole, they tentatively suggest that there is a relationship between problem-solving appraisal and performance.

Hypothesis 2 which stated that NPO, ICS and AS would be significantly associated with problem-solving effectiveness and that the relationship would be stronger after a defeat inducing task was not supported. The results seem to suggest that if there is a lack of motivation to solve problems then problem-solving effectiveness will be poor. Again, as stated above, it appears that defeat has no bearing on the nature of this relationship. As there are no previous studies with which to compare this finding it is difficult to generalise these findings with any certainty.

In support of hypothesis 3, defeat and entrapment were found to be significantly associated with NPO, ICS and AS. This suggests that if an individual is experiencing higher levels of defeat and entrapment then they are more likely to be more negative in their problem orientation and see problems as a threat, avoid problems and be more impulsive in how they deal with problems. These results support the findings from chapter 5 which also found that NPO had the strongest relationship with defeat and entrapment followed by AS and the weakest was ICS. Therefore, the results of these two separate studies show that

there is a relationship between feeling defeated and trapped with having a negative attitude towards problems and avoiding problems

8.5.2 Social problem-solving and psychological distress differences between those who reported self-harm versus those that did not

Support was found for the hypothesis 4 whereby individuals who reported self-harm were higher in NPO, ICS and AS and lower in PPO than the control group. The only subscale that was not significantly related was RPS. This means that individuals who report self-harm (compared to those without a self-harm history) are more likely to avoid problems, view problems as threats and be impulsive in their response to problems. These results are consistent with Reinecke et al. (2001) whereby they also found that NPO, AS and ICS were associated with severity of depression and suicidal thoughts in a group of adolescent inpatients. In addition, Reinecke et al. (2001) also failed to find a significant relationship with RPS, indeed this is the subscale of the SPSI-R which is least commonly found to have any significant associations (D'Zurilla et al., 2002). We also found in Chapter 5 that individuals who reported self-harm differed from those without a self-harm history on the NPO subscale of the SPSI-R.

It was predicted that individuals who reported self-harm would have higher levels of stress, hopelessness, depression, defeat, entrapment and suicide ideation than those without a self-harm history (hypothesis 5). The present findings replicate that what was found in chapter 5 and in Rasmussen et al. (2010). They suggest that individuals who are high on stress, depression, defeat entrapment and consequently experiencing suicide ideation are more likely to have reported self-harm at some point in their life.

8.5.3 Problem-solving performance and self-harm

The previous hypothesis (hypothesis 4) found that there was a significant difference in problem-solving orientation and style (in terms of the subscales of the SPSI-R) between those who had reported self-harm and those with no history of self-harm. We also wanted to test this difference in problem-solving performance using the MEPS-R. The findings were mixed as individuals who reported self-harm reported fewer means end problem-solving at T1 and T2 but the difference was only significant at T2 (hypothesis 6). Again, taking an overview, these findings suggest that there is a difference in problem-solving ability with individuals who report self-harm, and they are similar to Williams et al. (2005)

who found a difference between individuals who had a previous history of depression and a past suicide attempt form those with no past suicide attempt.

A difference was also found in the ratings of effectiveness between those who reported a history of self-harm and those with no history however, these findings were only found to be significant at T1 (hypothesis 7). These results suggest that there is a difference in the effectiveness of social problem-solving performance between the self-harm group and the control group. However, consistent with the relevant means findings it appears that the defeat induction task also had no bearing on effectiveness. The present effectiveness findings are also not consistent with Williams et al. (2005) who found that effectiveness was the area of problem-solving ability that a negative mood induction had the most significant impact upon. As previously stated it, therefore, seems that defeat has little bearing on problem-solving effectiveness yet the descriptive statistics tentatively suggest that there may be a difference for individuals who report self-harm and those with no history of self-harm.

In summary, these results found that there was a significant difference between the number of relevant means and problem-solving effectiveness between individuals who reported self-harm and those with no history of self-harm.

8.5.4 Social problem-solving performance after a defeat manipulation
Overlapping with hypotheses 6 and 7, one aim of this study was to determine whether feelings of defeat can directly affect social problem-solving performance. It was hypothesised that participants in the defeat condition would report fewer relevant means than those in the control condition (hypothesis 8). Although from eyeballing the descriptive statistics there looked as though there may have been a difference in the number of relevant means in the defeat condition before and after the defeat inducing task this difference was not significant. This suggests that although the defeat manipulation was successful, it appears that defeat has no bearing on social problem-solving performance. In the Williams et al. study (2005) the authors also found that there was a difference in the number of relevant means reported before and after a mood inducing task but similar with this study's findings their results were not significant.

It was further hypothesised (hypothesis 9) that participants in the defeat condition would exhibit less effective problem-solving performance than those in the control condition, the

results found a slight decrease in effectiveness before and after the defeat inducing task but this difference was not significant. Again as the defeat manipulation was successful, it suggests that defeat has no bearing on effectiveness. This is in contrast to Williams et al. (2005) who found a significant difference in the effectiveness scores following a mood induction only in the group who had a history of suicide attempts. Therefore, as this study has not replicated that finding it is difficult to extend this to a defeat induction and to individuals who report self-harm.

It may be that defeat does not cause the same cognitive reactivity as inducing negative mood does. However another important difference between this study and Williams et al. (2005) is that this was a sample of individuals who reported self-harm. A detailed clinical history was not recorded although the mean depression scores in the present study were much higher than in Williams et al. (2005) depressed groups but the level of suicide ideation for participants in this study was very low to almost negligible. The scores for defeat in the self-harm group in this study were almost double that of the control group which could be a factor. Ultimately, it is difficult to identify why the defeat manipulation did not induce cognitive reactivity that would re-activate poorer problem-solving performance.

8.5.5 Study limitations

This study had several limitations which are worthy of comment. Firstly, the group sizes were relatively small; this is particularly relevant for the self-harm group in the control condition where there were five fewer participants than in the other groups. Small numbers mean that there could have been the possibility of a type II error so we may have missed some findings with relatively modest effect sizes.

Second, the randomisation towards the end of the study was not as it had been throughout. Due to a similar study running within the research group it was necessary to identify participants who had previously taken part in another study which employed similar methods to this one. If they had not participated in the previous study, they were put into the experimental condition, if they had they were put in the control group.

Third, in relation to individuals who reported self-harm, it was not recorded when individuals had last self-harmed, participants were only asked if they had ever self-harmed. Consequently this meant that it was not known when individuals last self-harmed or if they

were still self harming. Consequently, the differential histories of those in the self-harm group may have had a negative impact on the findings within this group.

Fourth, defeat was only measured using a visual analogue scale. Although wildly used (the VAS has been shown to be an effective way to measure mood fluctuations caused by mood inductions Goldstein & Willner, 2002) it could be argued that it is psychometrically unstandardized – and not as sensitive to changes before and after a defeat induction. Nonetheless, the defeat manipulation did appear to be successful in this study.

Fifth, it is possible that participants in the no-defeat condition could still have felt deflated or adversely affected by the puzzle task. Even though it was achievable it was difficult. Some participants may still have felt anxious as they were being asked to complete a task which had a pass mark and this may have affected their scores on problem-solving performance and effectiveness ratings. Importantly, some participants in the control condition did exclaim that they found the task difficult to complete saying that they were not good at doing that sort of task.

The study employed all ten MEPS-R scenarios, so even before the mood induction participants could have become fatigued or suffered from the loss of motivation. The length of this task could have affected performance before the defeat/no defeat task and thereby masking the impact of defeat on their social problem-solving performance.

A final limitation involves the number of hypothesis outlined for this study. Nine study hypotheses could be regarded as excessive and increases the likelihood of Type 1 errors. Future research should therefore restrict the number of hypotheses within a study design.

8.5.6 Implications and Future research

Despite the limitations noted above, there are a number of research implications from this study. First, it is clear that dysfunctional problem-solving subscales (NPO, ICS and AS) are important factors in the context of individuals who report self-harm. In addition, these subscales were also found to be associated with defeat and entrapment, therefore these aspects of social problem-solving should be prioritised in any subsequent social problem-solving intervention. Most interventions focus on educating people on how to better identify their options and then how to weigh up the pros and cons when deciding on a

strategy to deal with the problem. This study and the findings from chapter 5 highlight the possibility that interventions should shift their focus to skills that can help with aspects of motivation and strategies to help with avoidance. Problem-solving interventions for self-harm patients have been found to produce better results than other interventions (Collinson et al., 2014; Townsend, 2001). Interventions can have long-term benefits, as they help people to cope with difficult problems and challenging issues in life - which is particularly relevant for individuals who self-harm. For these reasons, establishing the areas of social problem-solving which are the most pernicious during psychological distress could enable a more contained intervention that is immediately targeting the areas that require skills and strategies to help deal with.

Future research should aim to replicate these findings with the subscales of the SPSI-R in a clinical population. Secondly, the effect of defeat on social problem-solving performance appears limited, however, because the sample size in this study was quite small it would seem reasonable to investigate this relationship further using a larger sample; and if successful, a natural progression would be to extend the experimental induction component to a clinical population. In general, though future research should further investigates the relationship between problem-solving appraisal and performance as this study yielded some promising findings that require further exploration.

8.5.7 Conclusions

The dysfunctional subscales of the SPSI-R, the number of relevant means and problem-solving effectiveness were found to differentiate between individuals who reported self-harm and those with no history of self-harm. These subscales were further found to be associated with the number of relevant means and psychological distress, specifically defeat and entrapment. However, the impact of defeat on the number of relevant means and effectiveness seems to be limited as this study found no effect of the defeat induction on problem-solving performance.

Chapter Nine: General Discussion

9.1 Abstract

Background

This final chapter discusses the key findings of this thesis from across the empirical studies in relation to understanding the relationship between social problem-solving and suicidal ideation and behaviour.

Method

The results of the thesis are summarised in terms of what has been learned about the measures of social problem-solving and the relationship between social problem-solving, defeat and suicidality. The findings from the research carried out within this thesis are then considered and the implications for theory and practice are discussed. The chapter then goes on to discuss future directions.

Results

This chapter summarises the key findings of this thesis. Although it is difficult to highlight individual findings, taken as a whole, the thesis yields evidence in support of the role of social problem-solving within the suicidal process. More work is required to determine the clinical and predictive utility of the new measure of Means-End Problem-Solving task (MEPS-R).

Conclusion

The key findings of this thesis are summarised and discussed and their contribution to the wider theoretical debate on the role of social problem-solving in the aetiology of suicidality evaluated. The practical implications are also considered.

9.2 Introduction and Overview

Social problem-solving is a key skill that is required to deal with the challenges of everyday problems and indeed suicide can be viewed by some as the final and permanent solution to deal with life's problems. Current suicide research today views social problem-solving as a key cognitive risk factor in the aetiology and course of suicidal ideation and behaviour. Therefore, this thesis has investigated the nature of the relationship between social problem-solving and other cognitive and individual differences factors within the context of suicide risk. In addition, following a critical appraisal of the research literature which has investigated existing measures of social problem-solving it was clear that the Means End Problem-Solving task (MEPS; the most widely used social problem-solving outcome measure) would benefit from being revised and updated. It was also clear that there were a number of unanswered questions regarding the relationship between different components of social problem-solving and suicidality. This chapter summarises the findings from the five empirical chapters (that contain five studies), which were designed to meet the aims of the thesis. The findings are discussed along with implications for theory and practice. This chapter ends with a discussion of the thesis limitations and a critique of how the present study has added to the extant literature.

9.3 Summary of findings

This thesis had three overarching aims; the first was to evaluate the utility of social problem-solving measures that have been employed within research into suicidal behaviour. This was achieved by conducting a systematic review of the literature (Chapter 3) which found that the MEPS (Platt & Spivack, 1975) and the SPSI-R (D'Zurilla et al, 2002) were the most popular and comprehensive measures employed within suicide research. As a direct consequence of conducting the systematic review, it was clear that the MEPS (Platt & Spivack, 1975) needed to be revised and updated (leading to the MEPS-R, see Chapter 6). The MEPS-R was subsequently tested in two studies, which included the administration of the MEPS on-line for the first-time (Chapter 7). Reviewing the measures of social problem-solving also highlighted the utility of using both a process and outcome measures of social problem-solving within suicide research (Chapter 8). The systematic review also identified the SPSI-R as being a useful measure to examine more closely the relationship between social problem-solving and suicidality.

The second aim of this thesis was to investigate the relationship between social problem-solving and suicidality within the context of the Integrated Motivational Volitional model of suicidal behaviour (IMV; O'Connor, 2011) as a theoretical framework. The systematic review in Chapter 3 found that there was an inverse relationship between social problem-solving and suicidality. Chapters 5 and 8 examined the differences in the subscales of the SPSI-R with a sample of individuals who had/had not reported a history of self-harm. In Chapter 5 it was clear that the SPSI-R subscale of negative problem-orientation (NPO) was associated with self-harm history. Specifically, individuals with a history of self-harm reported higher levels of NPO compared to those no history of self-harm. This finding was also supported by the Chapter 8 results. In addition, individuals with a history of self-harm also reported higher levels of the other dysfunctional subscales (namely, impulsive/careless style (ICS) and avoidance style (AS)) compared to those who reported no history of self-harm. The only functional subscale of the SPSI-R found to differentiate between the two groups was positive problem-orientation. In Chapter 8 actual problem-solving performance was investigated by employing the MEPS-R. Although there was a trend for individuals who reported a history of self-harm to exhibit fewer relevant means and less effectiveness ratings than those who did not report a history of self-harm, however these differences were not found to be significant.

We also tested the relationship between the subscales of the SPSI-R and rumination and goal adjustment in Chapter 5. The results largely supported the hypotheses. As expected, the dysfunctional problem-solving subscales were associated with brooding rumination. We further found that goal disengagement was negatively associated with PPO and RPS whilst goal reengagement was negatively associated with NPO, ICS and AS. The findings regarding the predictive utility of the different problem-solving sub-types were less conclusive. Although NPO, ICS and AS predicted hopelessness at Time 1, they did not predict hopelessness at Time 2 when depression was controlled for in the analyses.

We also tested the relationship between the subscales of the SPSI-R and existing suicide risk factors within the IMV Model of suicidal behaviour and found that RPS mediated the defeat-entrapment relationship whilst NPO and AS moderated this relationship. Further support was found for the model as goal reengagement acted as a moderator of the entrapment-suicide ideation relationship, whilst brooding rumination was found to mediate the defeat-entrapment relationship.

The final aim was to gain a clearer understanding of the relationship between social problem-solving and defeat in the context of suicide risk. In Chapters 5 and 8, the relationship between the subscales of the SPSI-R and defeat was examined. In both studies contained therein the dysfunctional subscales (NPO, ICS and AS) were positively associated with defeat and PPO was the only subscale found to be negatively associated with defeat. Problem-solving ability (as indexed by the number of relevant means generated and overall effectiveness) were also found to be negatively associated with defeat (Chapter 8). Nevertheless, also in Chapter 8, there was no evidence that the experimental manipulation of defeat affected actual problem-solving performance.

The next section discusses the findings from this thesis by using the overarching research questions to structure the discussion.

9.4 Discussion of main findings

9.4.1 Measures of social problem-solving employed with suicide research

As previously stated, the results of this thesis found that the most common measures social problem-solving employed within suicide research were the Means End Problem-Solving task (MEPS; Platt & Spivack, 1975) and the SPSI-R (D'Zurilla et al., 2002). This finding therefore guided the selection of measures of social problem-solving employed within this thesis (the SPSI-R and the MEPS). Our up-to-date review was consistent with two earlier reviews (Speckens & Hawton, 2005; Pollock & Williams, 1998) which had also identified the MEPS as a commonly used measure of social problem-solving within suicide research. However, at the time of the earlier reviews the PSI had been the most popular social problem-solving process measure in the field. In the past 10 years, the SPSI-R has grown in popularity and overtaken the PSI in terms of usage and impact (see Chapter 3 for the details). There are considerable advantages to using the SPSI-R, the most important being the existence of distinct subscales of social problem-solving which affords a more detailed examination of the relationship between social problem-solving and suicide risk.

9.4.1.1 Revising the MEPS
The MEPS (Platt & Spivack, 1975) was revised (Chapter 6) and then tested in two separate studies (Chapter 7), one of which was on-line. Although there were differences in the scores obtained when using the MEPS-R on-line versus face-to-face, the findings from Chapter 7 support its use on-line. This is a particularly welcome development especially in

the context of conducting studies involving large and perhaps remote samples. A new coding framework was also developed to aid scoring of the MEPS-R and consistency was found to be good between two independent raters, which suggests that the coding framework is a reliable tool for scoring the revised measure. Internal consistency was also found to be good across the three studies which tested and employed this new measure.

Notwithstanding the aforementioned advances in methodology and knowledge, when testing the MEPS-R we failed to find any significant correlations with other known correlates of psychological distress in two separate studies in Chapter 7. One issue related to the lack of correlations between the SPSI-R and the MEPS-R, the former is a process measure and the latter is measuring actual problem-solving ability. Herein lies the difficulty in assessing the relationship between these two measures. When completing the SPSI-R, individuals will score how they believe they deal with life's problems but in reality their actual problem-solving performance, as assessed via the MEPS, may not reflect their appraisal of their performance. It is also important to consider that the SPSI-R measures five different constructs of social problem-solving, however, these constructs are not necessarily considered when scoring the MEPS. Although the correlations between all of the subscales of the SPSI-R and the MEPS-R were low, (indicating good discriminant validity) this was unexpected as PPO and RPS would have been expected to correlate highly with actual problem-solving performance. As they did not we had evidence of low convergent validity, when one would have expected convergent validity to be high. In general, the validity for the MEPS-R was not good in these two studies as it did not correlate with other known correlates of social problem-solving, including depression.

Chapter 8 employed the same measures used in Chapter 7 (testing the MEPS-R) and found that the number of relevant means and overall effectiveness ratings were found to be negatively correlated with stress, depression, defeat, entrapment and suicide ideation. In addition, a difference was found in problem-solving ability in individuals who reported/did not report self-harm. So, although these findings are mixed, taken as a whole, they suggest that this measure is reliable and should be tested further especially among individuals with high levels of psychological distress. Finally, by revising and updating the MEPS, the research contained within this thesis has addressed a major criticism levelled at the MEPS, (House & Scott, 1996) that its scenarios are out dated and not applicable to modern society.

9.4.2 Relationship between social problem-solving and suicidality

Chapter 3 described a systematic review of the suicide literature examining the relationship between social problem-solving and suicidality. The review found that there was an inverse relationship between social problem-solving and suicidality as well as identifying some gaps in the research literature. One of those was the dearth of research examining social problem-solving and actual suicidal behaviour. In response to this, as part of this thesis, individuals with a history of self-harm were recruited and their performance on the MEPS-R and SPSI-R assessed. This systematic review further found that 99% of the studies found evidence of a relationship between social problem-solving and suicidality. Nevertheless, in large part, the research focused primarily on suicide ideation and much of the attention was on student samples. There was a dearth of studies investigating social problem-solving within a general population which could increase our understanding beyond that of a student population.

As noted above we found in Chapter 5 that individuals who reported self-harm were higher in dysfunctional social problem-solving (NPO), than those with no self-harm history. This finding was extended in Chapter 8 as the study found that, in addition to NPO, impulsive/careless problem-solving (ICS) and avoidance style (AS) were also higher in individuals with a history of self-harm (compared to those low on self-harm). Those individuals were also found to be lower in the functional social problem-solving subscale of positive problem orientation (PPO). These findings also support and extend previous research (Gibbs 2009; Turner, et al., 2012; D'Zurilla, et al., 1998) which identified that the dysfunctional subscales of the SPSI-R were more pernicious in a variety of populations. However, this study has extended these findings by specifically examining the different problem-solving styles of individuals who report self-harm.

Consistent with previous research (Reinecke, et al., 2001) in Chapters 5 and 8 we found no significant findings in relation to rational problem-solving (RPS). It seems, therefore, that RPS is not implicated in the development of suicidal thinking or behaviour. In contrast, the dysfunctional subscales were found to be positively associated with stress, hopelessness, depression, suicide ideation, defeat and entrapment in Chapter 5 and 8. This suggests that dysfunctional problem-solving is an important factor in suicide risk and interventions to modify such problem-solving styles should be developed.

The findings in respect of the predictive utility of social problem-solving were disappointing. We investigated the predictive utility of the SPSI-R subscales in Chapter 5 and initially found that the subscales of NPO, ICS and AS predicted hopelessness at Time 1 whilst controlling for depression. However, when we extended the analyses to actual prediction over time failed to find any other results with social problem-solving as a predictor of psychological distress. None of the subscales predicted hopelessness at Time 2 nor did they predict suicide ideations at Time 1 or 2. These results do tend to suggest that social problem-solving may not be uniquely predictive of suicidal ideation and it may be (as discussed in Chapter 5) that it is associated with depression and it is depression that is responsible for the increased suicide risk. Findings from previous research have also been quite mixed in this area (Clum et al 1996; Dieserud, et al., 2000), however, like the present research, D'Zurilla et al. (1998) also found NPO to be a predictor of hopelessness. The mean scores of the problem-solving subscales were much lower in Chapter 5 than they were in Chapter 8, therefore, this could go some way to explain the lack of findings for social problem-solving predicting suicide ideation.

This lack of findings could also be related to the issue of causation where it may be that suicidality impacts on social problem-solving rather than vice versa. Indeed, Schotte, Cools and Payvar (1990) found that a reduction in mood and suicide intent was associated with improvements in social problem-solving over time. Therefore, psychological distress may impact upon social problem-solving ability, for example dichotomised thinking could limit one's social problem-solving capacity. If one views suicide or self-harm as an option would these thoughts limit their capacity to engage in other cognitive and behavioural strategies to solve social problems? This is a question which requires further attention, as it was beyond the scope of this thesis as the IMV model of suicidal behaviour was the guiding framework for hypothesis testing within this thesis.

In summary, this thesis has established that dysfunctional social problem-solving is an important correlate of suicidality. The dysfunctional constructs differentiated between individuals with and without a history of self-harm, and they were negatively associated with psychological distress and predicted hopelessness. These findings go some way to explaining the relationship between social problem-solving and suicidal ideation/behaviour and because the studies have investigated the different components of the SPSI-R and MEPS.

9.4.3 Relationship between social problem-solving, rumination and goal adjustment

One aim of Chapter 5 was to investigate the relationship between social problem-solving, rumination and goal adjustment by using the subscales of the SPSI-R. We found that the dysfunctional subscales of the SPSI-R are associated with brooding rumination, specifically NPO was found to have the strongest association. This finding suggests that if one has a negative attitude towards problems and feels like they are insurmountable then that individual is likely to be dwelling on the past rather than thinking of ways to solve their problems. Our finding is consistent with earlier research (Treynor et al., 2003) but given that previous research has focused on a composite measure of social problem-solving the findings from this thesis suggests that the focus should be on the presence of dysfunctional social problem-solving rather than the absence of adaptive problem-solving.

There is very little previous research examining the relationship between goal adjustment and social problem-solving however, this study found that goal disengagement was negatively associated with NPO, ICS and AS meaning that if one is high on disengaging from goals then they are likely to be quite dysfunctional in their problem-solving orientation and style. Whereas functional problem-solving was found to be negatively associated with goal reengagement whereby individuals who are feel positive about problems and weigh up the pros and cons to solutions are likely to be low at reengaging in new goals. Unfortunately there is no research to compare these somewhat unexpected findings to, however, these results do seem to suggest that there is something going on between these key risk factors in suicidal behaviour and warrant further investigation to see if these results are replicated.

9.4.4 Integrated Motivational Volitional model of suicidal behaviour

The IMV provided a theoretical basis for the variables that were investigated within this research. We were primarily concerned with the motivational phase, which informs us that defeat and entrapment are key variables within the model. Social problem-solving and rumination are both posited to be threat to self moderators within the IMV model and although both rumination and social problem-solving have been associated with suicidality (Speckens & Hawton; Morrison & O'Connor, 2008) their specific relationship with defeat and entrapment had not been investigated. The results were not what had been hypothesised and RPS was the only social problem-solving subscale that was found to moderate the relationship between defeat and entrapment. However, further analysis did find that NPO and AS mediated the defeat-entrapment relationship (Chapter 5). We also

found no evidence for brooding rumination as a moderator within the model but did find that it mediated the defeat-entrapment relationship. We also investigated the relationship between goal reengagement and entrapment within the model as it is also a key variable in the motivational phase but is posited as a motivational moderator. Goal reengagement as hypothesised, was found to moderate the entrapment-suicide ideation relation and this is consistent with other research findings (O'Connor et al., 2012). In short these findings support the utility of the IMV model as a conceptual framework for investigating risk factors in suicidal behaviour. Notwithstanding, the findings do question whether problem-solving and rumination are best conceptualised as mediators rather than moderators within the model. However, given the low levels of defeat, entrapment and suicidal ideation reported by the participants, it may simply be that it was not possible to detect moderating relationships because of the restricted variance of these variables.

9.4.5 Relationship between social problem-solving and defeat

As previously stated, defeat was found to be positively associated with dysfunctional social problem-solving subscales, which was found in two separate studies. Chapter 8 also found a significant association between defeat and actual problem-solving performance, however a key research question in Chapter 8 concerned the effect of defeat on social problem-solving ability. We did not find any evidence for the causal effect of defeat on social problem-solving performance. This was not consistent with Williams et al. (2005) who found that mood had a specific effect on the effectiveness of solutions. The findings from this thesis suggest that specific perceptions of defeat do not affect social problem-solving performance. However, it is important to investigate the effect of defeat on social problem-solving in individuals with different mental health histories, as it may be the effect of defeat is marked in individuals with a past/current history of depression or suicidality.

9.5 Implications for theory and practice

The findings from this thesis have reinforced the utility of employing the SPSI-R as a measure of social problem-solving in the context of suicide research. Indeed it would be helpful if future research could benefit from consistently employing this measure of social problem-solving to continue to advance our understanding of its relationship with suicidal behaviour. The SPSI-R is a key tool in this regard because it operationalizes social

problem-solving not as a single composite measure but rather as a much more complex human behaviour. It recognises that social problem-solving is a mixture of different cognitive abilities/approaches which requires a more detailed psychological measure to assess accurately. This thesis has also updated the original MEPS, by developing new and revised scenarios that are more appropriate for today's society. Future research will be able to employ the MEPS-R, which will go some way to provide consistency across studies in suicidal behaviour research.

The findings also have some implications for the IMV model and its utility in helping us to understand the relationship between social problem-solving and suicidality. Overall the IMV model appears to be a useful framework for understanding suicidal behaviour, but as noted above this thesis has found mixed mediation and moderation findings. Both NPO and AS partially mediated the defeat-entrapment relationship suggesting that other factors may be more relevant in the model or that there are other variables that are not included in the model which are important for the understanding of the relationship between social problem-solving and suicidal behaviour. Another consideration is that social problem-solving may not be confined to the motivational phase. Future research should investigate the extent to which social problem-solving is associated with factors within other phases of the model. Importantly though, this thesis did find a role for threat to self and motivational moderators within the model.

Turning now to the wider implications of this thesis. We need to think again about which components of social problem-solving should be targeted in treatment interventions. For example, social problem-solving interventions tend to focus on teaching individuals how to weigh up the pros and cons to problem solutions. However, in this thesis we found no difference in rational problem-solving between different groups (self-harm versus no-self-harm), indeed scores were very similar in both studies for both the groups (see Chapter 5). It could, therefore, be that this is not the most useful skill to focus on in problem-solving interventions. Given that we found NPO to be the most pernicious aspect of social problem-solving it may be much more fruitful to focus on it.

9.6 Limitations and directions of future research

In terms of the various methods employed throughout this thesis there were limitations in terms of the study populations, the samples sizes and the measures employed. Firstly, it is

important to acknowledge the use of inferential statistics within this thesis, the resultant findings must be cautiously interpreted cautiously and the extent to which the findings are generalizable to general population samples has yet to be determined. Another methodological limitation was the number of hypotheses detailed for each of the studies. For example in Chapter 5 there were 12 hypotheses, however, it is worthy of note that this was an exploratory study and a number of the hypotheses were linked to subscales of the SPSI-R, rumination and goal adjustment and all of the hypotheses were theoretically-derived.

This thesis aimed to recruit individuals who reported a history of self-harm in an attempt to examine the differences in social problem-solving between individuals who did/did not report a history of self-harm. Due to the constraints of the PhD it was only possible to recruit from student and general population samples within the existing timeframe. As a result of recruiting relatively healthy participants, the mean scores for depression and suicide ideation were very low and as a consequence it made testing some of the hypotheses more difficult. Future research should extend the research within this thesis by testing the hypotheses within clinical populations which should help to eradicate some of the problems with testing the mediating and moderating relationship in particular. In particular as the MEPS-R was tested with students and a general population further research should be carried out with clinical populations to investigate the validity of the scenarios within this population. Much of the research employing the MEPS is carried out with clinical samples, therefore it is crucial that further testing of this measure is carried out with this population.

The lack of formal power calculations in a number of the studies (with the exception of the study reported in Chapter 8) is a methodological issue worthy of comment. Sample sizes reported in Chapter 5 were based on the maximum number of predictor variables in a single analysis but they also operated within the constrains of a University recruitment programme (i.e., recruiting participants from University participant pools) which places limits on the maximum number of participants one can recruit for any single study. In addition, to maximise the sample size, it could be argued that our inclusion criteria were not strict or sensitive enough – and this may also have had a negative impact on the findings. For example, as noted in Chapter 8, although we asked potential participants whether or not they had self-harmed in the past, we did not identify when individuals had last self-harmed nor if they were still self-harming. Future research should not only take

this into consideration but it should investigate different sub-groups of self-harm, including those who have self-harmed once versus repeatedly. Given the recent research in the transition from thoughts of self-harm to acts of self-harm (O'Connor, et al., 2012), future research should also investigate whether self-harm 'ideators' differ from self-harm 'enactors' in terms of social problem-solving.

The sample sizes in Chapter 6 and 8 were quite small but, but for the most part, appropriate for the aims of the research. For example, in Chapter 6 we revised the original MEPS with the second round of analysis involving the use of focus groups as a method to obtain participants' views on the MEPS-R. Although this only involved a total of 14 participants we believe that this sample size was sufficient given the nature of the method of data collection (i.e., it was detailed and in-depth). Conversely, the study in Chapter 8 also had a small sample size particularly in respect of the self-harm group, however given that we were endeavouring to test group by time differences, the modest sample size could have meant that the findings were in danger of a type II error. Therefore, any future studies investigating social problem-solving, defeat and self-harm should recruit larger samples sizes.

Although we administered all 10 scenarios of the MEPS-R, this may have had an adverse effect on the findings (discussed in detail in Chapter 8). We did so to test the feasibility of the new measure, however, as per Platt & Spivack (1975)'s recommendations we expect the number of scenarios to be reduced in future research. This may then reduce potential participant fatigue and may also to help with the pragmatics of conducting the studies.

9.7 Conclusion
In conclusion, this thesis has made an important contribution to the understanding of social problem-solving in individuals who report a history of self-harm as well as more generally in healthy adult populations. By analysing the subscales of the SPSI-R and employing the MEPS-R we have provided some clarity on the differences in social problem-solving in individuals with and without a self-harm history as well as better understanding of the relationship between social problem-solving and other indices of distress.

This research has also used the subscales of the SPSI-R and MEPS to test aspects of the IMV model of suicidal behaviour (O'Connor, 2011). This has aided our understanding of how social problem-solving fits within the model. The model is a useful framework for

understanding the relationship between social problem-solving, defeat and entrapment however, further research is required to further explore the different relationships in more detail. Finally this thesis has successfully revised and updated a popular measure of social problem-solving performance which now requires closer scrutiny within a clinical population.

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APPENDIX 1: SPSI-R

SPSI–R:S

Thomas J. D'Zurilla, Ph.D., Arthur M. Nezu, Ph.D., & Albert Maydeu-Olivares, Ph.D.

Client ID:_____ Age:_____ Gender: M   F
(circle one)

Date of Birth:_____/_____/_____ Today's Date:_____/_____/_____
              mm   dd   yyyy   mm   dd   yyyy

Instructions: Below are some ways that you might think, feel, and act when faced with problems in everyday living. We are not talking about the ordinary hassles and pressures that you handle successfully every day. In this questionnaire, a problem is something important in your life that bothers you a lot, but you don't immediately know how to make it better or stop it from bothering you so much. The problem could be something about yourself (such as your thoughts, feelings, behavior, health, or appearance), your relationships with other people (such as your family, friends, teachers, or boss), or your environment and the things you own (such as your house, car, property, or money). Please read each statement carefully and choose one of the numbers below that best shows how much the statement is true of you. See yourself as you usually think, feel, and act when you are faced with important problems in your life these days. Circle the number that is the most true of you. Do not erase if you want to change an answer, instead put an "X" through the answer you wish to change. Try to answer all of the questions.

		Not at All True of Me	Slightly True of Me	Moderately True of Me	Very True of Me	Extremely True of Me
		0	**1**	**2**	**3**	**4**
1.	I feel threatened and afraid when I have an important problem to solve.	0	1	2	3	4
2.	When making decisions, I do not evaluate all my options carefully enough.	0	1	2	3	4
3.	I feel nervous and unsure of myself when I have an important decision to make.	0	1	2	3	4
4.	When my first efforts to solve a problem fail, I know if I persist and do not give up too easily, I will be able to eventually find a good solution.	0	1	2	3	4
5.	When I have a problem, I try to see it as a challenge, or opportunity to benefit in some positive way from having the problem.	0	1	2	3	4
6.	I wait to see if a problem will resolve itself first, before trying to solve it myself.	0	1	2	3	4
7.	When my first efforts to solve a problem fail, I get very frustrated.	0	1	2	3	4
8.	When I am faced with a difficult problem, I doubt that I will be able to solve it on my own no matter how hard I try.	0	1	2	3	4
9.	Whenever I have a problem, I believe that it can be solved.	0	1	2	3	4
10.	I go out of my way to avoid having to deal with problems in my life.	0	1	2	3	4
11.	Difficult problems make me very upset.	0	1	2	3	4
12.	When I have a decision to make, I try to predict the positive and negative consequences of each option.	0	1	2	3	4
13.	When problems occur in my life, I like to deal with them as soon as possible.	0	1	2	3	4
14.	When I am trying to solve a problem, I go with the first good idea that comes to mind.	0	1	2	3	4
15.	When I am faced with a difficult problem, I believe that I will be able to solve it on my own if I try hard enough.	0	1	2	3	4
16.	When I have a problem to solve, one of the first things I do is get as many facts about the problem as possible.	0	1	2	3	4
17.	When a problem occurs in my life, I put off trying to solve it for as long as possible.	0	1	2	3	4
18.	I spend more time avoiding my problems than solving them.	0	1	2	3	4
19.	Before I try to solve a problem, I set a specific goal so that I know exactly what I want to accomplish.	0	1	2	3	4
20.	When I have a decision to make, I do not take the time to consider the pros and cons of each option.	0	1	2	3	4
21.	After carrying out a solution to a problem, I try to evaluate as carefully as possible how much the situation has changed for the better.	0	1	2	3	4
22.	I put off solving problems until it is too late to do anything about them.	0	1	2	3	4
23.	When I am trying to solve a problem, I think of as many options as possible until I cannot come up with any more ideas.	0	1	2	3	4
24.	When making decisions, I go with my "gut feeling" without thinking too much about the consequences of each option.	0	1	2	3	4
25.	I am too impulsive when it comes to making decisions.	0	1	2	3	4

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Appendix 2: Response Styles Scale

Directions: People think and do many different things when they feel sad, blue or depressed. Please read each of the items below and indicate whether you never, sometimes, often or always do each one **when you feel sad, down, or depressed**. Please indicate what you generally do,

Think "What am I doing to deserve this?"
Almost Never
Sometimes
Often
Almost Always

Think about a recent situation wishing it had Gone better
Almost Never
Sometimes
Often
Almost Always

Analyse recent events to try to understand why you are depressed
Almost Never
Sometimes
Often
Almost Always

Think "Why do I have problems other people don't have?"
Almost Never
Sometimes
Often
Almost Always

Think "Why do I always react this way?"
Almost Never
Sometimes
Often
Almost Always

Think "Why can't I handle things better?"
Almost Never
Sometimes
Often
Almost Always

Go away by yourself and think about why you feel this way
Almost Never
Sometimes
Often
Almost Always

Analyse your personality and try to understand why you are depressed
Almost Never
Sometimes
Often
Almost Always

Write down what you are thinking and analyse it
Almost Never
Sometimes
Often
Almost Always

Go someplace alone to think about your feelings
Almost Never
Sometimes
Often
Almost Always

APPENDIX 3: Goal Adjustment Scale

During their lives people cannot always attain what they want and are sometimes forced to stop pursuing the goals they have set. We are interested in understanding how you usually react when this happens to you. Please indicate the extent to which you agree or disagree with each of the following statements, as it usually applies to you.

If I have to stop pursuing an important goal in my life…
1. It's easy for me to reduce my effort towards the goal.
2. I convince myself that I have other meaningful goals to pursue.
3. I stay committed to the goal for a long time; I can't let it go.
4. I start working on other new goals.
5. I think about other new goals to pursue
6. I find it difficult to stop trying to achieve the goal.
7. I seek other meaningful goals.
8. It's easy for me to stop thinking about the goal and let it go.
9. I tell myself that I have a number of other new goals to draw upon.
10. I put effort toward other meaningful goals.

APPENDIX 4 THE DEFEAT SCALE

Below is a series of statements, which describe how people can feel about themselves. Read each item carefully and circle the number to the right of the statement that best describes how you have felt in the last 7 days. Use the scale below. Please do not omit any item.

SCALE

0 = NEVER   1 = RARELY   2 = SOMETIMES   3 = MOSTLY (a lot)   4 = ALWAYS

1	I feel that I have not made it in life	0	1	2	3	4
2	I feel that I am a successful person	0	1	2	3	4
3	I feel defeated by life	0	1	2	3	4
4	I feel that I am basically a winner	0	1	2	3	4
5	I feel that I have lost my standing in the world	0	1	2	3	4
6	I feel that life has treated me like a punch bag	0	1	2	3	4
7	I feel powerless	0	1	2	3	4
8	I feel that my confidence has been knocked out of me	0	1	2	3	4
9	I feel able to deal with whatever life throws at me	0	1	2	3	4
10	I feel that I have sunk to the bottom of the ladder	0	1	2	3	4
11	I feel completely knocked out of action	0	1	2	3	4
12	I feel that I am one of life's losers	0	1	2	3	4
13	I feel that I have given up	0	1	2	3	4
14	I feel down and out	0	1	2	3	4
15	I feel that I have lost important battles in life	0	1	2	3	4
16	I feel that there is no fight left in me	0	1	2	3	4

APPENDIX 5 THE ENTRAPMENT SCALE

For each of the following attitude statements indicate the extent to which you think it represents your own view of yourself. Read each item carefully and circle the number to the right of the statement that best describes the degree to which each statement is Like You. Use the scale below. Please do not omit any item.

SCALE

0 = Not at all like me   **1 = A little bit like me**   **2 = Moderately like me**   **3 = Quite a bit like me**   **4 = Extremely like me**

1. I am in situation I feel trapped in	0 1 2 3 4
2. I have a strong desire to escape from things in my life	0 1 2 3 4
3. I am in a relationship I can't get out of	0 1 2 3 4
4. I often have the feeling that I would just like to run away	0 1 2 3 4
5. I feel powerless to change things	0 1 2 3 4
6. I feel trapped by my obligations	0 1 2 3 4
7. I can see no way out of my current situation	0 1 2 3 4
8. I would like to get away from other more powerful people in my life	0 1 2 3 4
9. I have a strong desire to get away and stay away from where I am now	0 1 2 3 4
10. I feel trapped by other people	0 1 2 3 4
11. I want to get away from myself	0 1 2 3 4
12. I feel powerless to change myself	0 1 2 3 4
13. I would like to escape from my thoughts and feeling	0 1 2 3 4
14. I feel trapped inside myself	0 1 2 3 4
15. I would like to get away from who I am and start again	0 1 2 3 4
16. I feel I'm in a deep hole I can't get out of	0 1 2 3 4

APPENDIX 6: SOCIAL SUPPORT

SCORING:

NONE OF THE TIME; A LITTLE OF THE TIME; SOME OF THE TIME; MOST OF THE TIME; ALL OF THE TIME.

1. Is there someone available to whom you can count on to listen to you when you need to talk
2. Is there someone available to you to give you good advice about a problem
3. Is there someone available to you who shows you love and affection
4. Is there someone available to help with daily chores
5. Can you count on anyone to provide you with emotional support (talking over problems or helping you make a difficult decision)
6. Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide in?
7. Are you currently married or living with a partner Yes/NO

APPENDIX 7 PERCEIVED STRESS SCALE

Please indicate how often you have felt or thought a certain way during the last four weeks.

NEVER; ALMOST NEVER; SOMETIMES; FAIRLY OFTEN and VERY OFTEN

1. Felt that you were unable to control important things in your life?

2. Felt confident about your ability to handle your personal problems?

3. Felt that things were going your way?

4. Felt difficulties were piling up so high that you could not overcome them?

APPENDIX 8: Beck Hopelessness Scale

1. I look forward to the future with hope and enthusiasm.
2. I might as well give up because I can't make things better for myself.
3. When things are going badly, I am helped by knowing they can't stay that way forever.
4. I can't imagine what my life would be like in 10 years.
5. I have enough time to accomplish the things I most want to do.
6. In the future, I expect to succeed in what concerns me most.
7. My future seems dark to me.
8. I expect to get more of the good things in life than the average person.
9. I just don't get the breaks, and there's no reason to believe I will in the future.
10. My past experiences have prepared me well for my future.
11. All I can see ahead of me is unpleasantness rather than pleasantness.
12. I don't expect to get what I really want.
13. When I look ahead to the future, I expect I will be happier than I am now.
14. Things just won't work out the way I want them to.
15. I have great faith in the future.
16. I never get what I want so it's foolish to want anything.
17. It is very unlikely that I will get any real satisfaction in the future.
18. The future seems vague and uncertain to me.
19. I can look forward to more good times than bad times.
20. There's no use in really trying to get something I want because I probably won't get it.

APPENDIX 9: Beck Depression Inventory

Directions: This part of the questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 or Item 18.

1. **Sadness**
   0 I do not feel sad.
   1 I feel sad much of the time.
   2 I am sad all the time.
   3 I am so sad or unhappy that I can't stand it.

2. **Pessimism**
   0 I am not discouraged about my future.
   1 I feel more discouraged about my future than I used to be.
   2 I do not expect things to work out for me.
   3 I feel my future is hopeless and will only get worse.

3. **Past Failure**
   0 I do not feel like a failure.
   1 I have failed more than I should have.
   2 As I look back, I see a lot of failures.
   3 I feel I am a total failure as a person.

4. **Loss of Pleasure**
   0 I get as much pleasure as I ever did from the things I enjoy.
   1 I don't enjoy things as much as I used to.
   2 I get very little pleasure from the things I used to enjoy.
   3 I can't get any pleasure from the things I used to enjoy.

5. **Guilty Feelings**
   0 I don't feel particularly guilty.
   1 I feel guilty over many things I have done or should have done.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.

6. **Punishment Feelings**
   0 I don't feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.

7. **Self-Dislike**
   0 I feel the same about myself as ever.
   1 I have lost confidence in myself.
   2 I am disappointed in myself.
   3 I dislike myself.

8. **Self-Criticicalness**
   0 I don't criticise or blame myself more than usual.
   1 I am more critical of myself than I used to be.
   2 I criticise myself for all of my faults.
   3 I blame myself for everything bad that happens.

9. **Suicidal Thoughts or Wishes**
   0 I don't have any thoughts of killing myself.
   1 I have thoughts of killing myself, but I would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. **Crying**
   0 I don't cry any more than I used to.
   1 I cry more than I used to.
   2 I cry over every little thing.
   3 I feel like crying, but I can't.

11. **Agitation**
   0 I am no more restless than usual.
   1 I feel more restless or wound up than usual.
   2 I am so restless or agitated that it's hard to stay stil
   3 I am so restless or agitated that I have to keep moving or doing something.

12. **Loss of Interest**
   0 I have not lost interest in other people or activities.
   1 I am less interested in other people or things than before.
   2 I have lost most of my interest in other people or things.
   3 It's hard to get interested in anything.

13. **Indecisiveness**
  - 0 I make decisions about as well as ever.
  - 1 I find it more difficult to make decisions than usual.
  - 2 I have much greater difficulty in making decisions than I used to.
  - 3 I have trouble making any decisions.

14. **Worthlessness**
  - 0 I do not feel I am worthless.
  - 1 I don't consider myself as worthwhile and useful as I used to.
  - 2 I feel more worthless as compared to other people.
  - 3 I feel utterly worthless.

15. **Loss of Energy**
  - 0 I have as much energy as ever.
  - 1 I have less energy than I used to have.
  - 2 I don't have enough energy to do very much.
  - 3 I don't have enough energy to do anything.

16. **Changes in Sleeping Pattern**
  - 0 I have not experienced any change in my sleeping pattern.
  - 1a I sleep somewhat more than usual.
  - 1b I sleep somewhat less than usual.
  - 2a I sleep a lot more than usual.
  - 2b I sleep a lot less than usual.
  - 3a I sleep most of the day.
  - 3b I wake up 1-2 hours early and can't get back to sleep.

17. **Irritability**
  - 0 I am no more irritable than usual.
  - 1 I am more irritable than usual.
  - 2 I am much more irritable than usual.
  - 3 I am irritable all the time.

18. **Changes in Appetite**
  - 0 I have not experienced any change in my appetite.
  - 1a My appetite is somewhat less than usual.
  - 1b My appetite is somewhat greater than usual.
  - 2a My appetite is much less than usual.
  - 2b My appetite is much greater than usual.
  - 3a I have no appetite at all.
  - 3b I crave food all the time.

19. **Concentration Difficulty**
  - 0 I can concentrate as well as ever.
  - 1 I can't concentrate as well as usual.
  - 2 It's hard to keep my mind on anything for very long
  - 3 I find I can't concentrate on anything.

20. **Tiredness or Fatigue**
  - 0 I am no more tired or fatigued than usual.
  - 1 I get more tired or fatigued more easily than usual.
  - 2 I am too tired or fatigued to do a lot of the things I used to do.
  - 3 I am too tired or fatigued to do most of the things I used to do.

21. **Loss of Interest in Sex**
  - 0 I have not noticed any recent change in my interest in sex.
  - 1 I am less interested in sex than I used to be.
  - 2 I am much less interested in sex now.
  - 3 I have lost interest in sex completely.

Appendix 10 Suicide Probability Scale

Instructions: Please read the statements below and indicate how often you they have applied to you in the past week.

None or a little of the time
Some of the time
Good part of the time
Most or all of the time

1. I think of things too bad to share with others

2. In order to punish others, I think of suicide

3. I feel I need to punish myself for things I have done and thought

4. I feel the world is not worth continuing to live in

5. I feel people would be better off if I were dead

6. I feel it would be less painful to die than to keep living the way things are

7. I have thought of how to do myself in

8. I think of suicide

APPENDIX 11: BSSI

Directions: Please carefully read each group of statements below. Circle one statement in each group that **best describes** how you have been feeling for the **past week, including today**. Be sure to read all of the statements in each group before making a choice.

1. 0   I have a moderate to strong wish to live.
   1   I have a weak wish to live.
   2   I have no wish to live.

2. 0   I have no wish to die.
   1   I have a weak wish to die.
   2   I have a moderate to strong wish to die.

3. 0   My reasons for living outweigh My reasons for dying.
   1   My reasons for living and dying are about equal.
   2   My reasons for dying outweigh my reasons for living.

4. 0   I have no desire to kill myself.
   1   I have a weak desire to kill myself
   2   I have a moderate to strong desire to kill myself

5. 0   I would try to save my life if I found myself in a life-threatening situation.
   1   I would take a chance on life or death if I found myself in a life-threatening situation.
   2   I would not take the steps necessary to avoid death if I found myself in a life-threatening situation.

If you have circled the 0 statements in both Groups 4 and 5 above, then skip down to Group 20 at the bottom of the next page. If you have marked a 1 or a 2 in either Group 4 and 5 then go to Group 6 below.

6. 0   I have brief periods of thinking about killing myself which pass quickly.
   1   I have periods of thinking about killing myself which last for moderate amounts of time.
   2   I have long periods of thinking about killing myself.

7. 0   I rarely or only occasionally think about killing myself.
   1   I have frequent thoughts about killing myself.
   2   I continuously think about killing myself.

8. 0   I do not accept the idea of killing myself.
   1   I neither accept nor reject the idea of killing myself.
   2   I accept the idea of killing myself.

9. 0   I can keep myself from committing suicide.
   1   I am unsure that I can keep myself from committing suicide.
   2   I cannot keep myself from committing suicide.

10. 0   I would not kill myself because of my family, friends, religion, possible injury from an attempt, etc.
    1   I am somewhat concerned about killing myself because of my family, friends, religion, possible injury from an attempt, etc.
    2   I am not or a little concerned about killing myself because of my family, friends, religion, possible injury from an attempt, etc.

11. 0   My reasons for wanting to commit suicide are primarily aimed at influencing other people, such as getting even with people, making people happier, making people pay attention to me, etc.
    1   My reasons for wanting to commit suicide are not only aimed at influencing other people, but also represent a way of solving my problems.
    2   My reasons for wanting to commit suicide are primarily based upon escaping from my problems

12. 0   I have no specific plan about how to kill myself.
    1   I have considered ways of killing myself, but have not worked out the details.
    2   I have a specific plan for killing myself.

13. 0   I do not have access to a method or an opportunity to kill myself.
    1   The method that I would use for committing suicide takes time, and I really do not have a good opportunity to use this method.
    2   I have access or anticipate having access to the method that I would choose for killing myself and also have or shall have the opportunity to use it.

14. 0   I do not have the courage or the ability to commit suicide.
    1   I am unsure that I have the courage or the ability to commit suicide.
    2   I have the courage and the ability to commit suicide

15. 0   I do not expect to make a suicide attempt.
    1   I am unsure that I shall make a suicide attempt.
    2   I am sure that I will make a suicide attempt.

16. 0   I have made no preparations for committing
          suicide.
     1   I have made some preparations for committing
          suicide.
     2   I have almost finished or completed my
          preparations for committing suicide.

17. 0   I have not written a suicide note.
     1   I have thought about writing a suicide note, but
          have not completed it.
     2   I have completed a suicide note.

18. 0   I have made no arrangements for what will happen
          after I have committed suicide.
     1   I have thought about making some arrangements
          for what will happen after I have committed suicide.
     2   I have made definite arrangements for what will
          happen after I have committed suicide.

19. 0   I have not hidden my desire to kill myself from
          people.
     1   I have held back telling people about wanting to kill
          myself.
     2   I have attempted to hide, conceal, or lie about
          wanting to commit suicide.

Go to Group 20, below.

20. 0   I have never attempted suicide.
     1   I have attempted suicide once.
     2   I have attempted suicide two times or more times.

     **If you have previously attempted suicide, please
     continue with the next statement group.**

21. 0   My wish to die during the last suicide attempt was
          low.
     1   My wish to die during the last suicide attempt was
          moderate.
     2   My wish to die during the last suicide attempt was
          high.

APPENDIX 12: EXAMPLE OF A CATEGORY SCORING SHEET

2.Part	Intros	Check	Retrace steps	Report	Tot
1.1					
2.1					
3.1					
4.1					
5.1					
6.1					
7.1					
8.1					
9.1					
10.1					
11.1					
12.1					
13.1					
14.1					
15.1					
16.1					
17.1					
18.1					
19.1					
20.1					

APPENDIX 13: VISUAL ANALOGUE SCALE

Please draw a vertical line on the line below to let us know how you are feeling right at this moment.

At this moment I feel...

DEFEATED

Not at all   Very

APPENDIX 14: SUPPORT SHEET

Support Sheet

At some time in all of our lives we feel down, depressed or blue. If you are feeling down, or are worried about something and would like to speak to someone, please see the list of organisations below.

You may also wish to contact your GP or another healthcare professional.

If you think your life or someone's life is in danger you should visit an emergency department or call an ambulance by dialling 999.

NHS 24. Health Information and Self Care Advice for Scotland

NHS 24 provides comprehensive up-to-date health information and self-care advice for people in Scotland. If your GP surgery is closed and you can't wait until it opens, you can call NHS 24. They will direct you to the right care for you or the person you are calling for. This may be to your local Health Board's out of hours services, Accident and Emergency department, or the Scottish Ambulance Service. If appropriate, they may recommend some steps you can take to look after yourself at home.

Tel: 08454 24 24 24

Samaritans

Samaritans is available 24 hours a day to provide confidential emotional support for people who are experiencing feelings of distress or despair, including those which may lead to suicide.

Tel: 08457 90 90 90

www.samaritans.org.uk

Breathing Space

Breathing Space is a free and confidential phoneline service for any individual, who is experiencing low mood or depression, or who is unusually worried and in need of someone to talk to. The phoneline is open 24 hours at weekends (6pm Friday - 6am Monday) and from 6pm to 2am on weekdays (Monday - Thursday)**.**

Tel: 0800 83 85 87

www.breathingspacescotland.co.uk

Western Infirmary
Emergency Room Western Infirmary, Dumbarton Road, Glasgow. G11 6NT The Emergency Department prioritise people who have a serious injury or accident or who have a sudden serious illness or medical condition. If you think that a life is at risk you should call 999 right away.Tel: 0141 211 2000

Scottish Association for Mental Health (SAMH)

SAMH is a Scottish mental health charity which operates an information service from Monday to Friday between the hours of 2pm and 4pm. Information service staff and volunteers can answer general mental health enquiries, advise you on your rights and signpost you to your local services.

Tel: 0800 917 3466

www.samh.org.uk

Penumbra

Penumbra is a Scottish mental health charity, working to improve mental wellbeing across the nation. They provide a wide range of services which offer hope and practical steps towards recovery. Penumbra offers a variety of services to support those experiencing mental ill health.

For more information contact:

Tel: 0131 475 2380

www.penumbra.org.uk

APPENDIX 15: FG QUESTIONNAIRE FOR ORIGINAL MEPS

Scenario 1.

Alex was listening to the people speaking at a meeting about how to make things better in her neighbourhood. She wanted to say something important and have a chance to be leader too.

The story ends with her being elected leader and presenting a speech.

You begin the story at the meeting where she wanted to have a chance to be leader.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 2.

Heather loved her boyfriend very much, but they had many arguments. One day he left her. Heather wanted things to be better.

The story ends with everything fine between her and her boyfriend.

You begin the story with her boyfriend leaving her after an argument.

How easy or difficult is it for you to imagine being in this situation?

(very easy)   1   2   3   4   5 (very difficult)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 3.

Paula came home after shopping and found that she had lost her watch. She was very upset about it.

The story ends with Paula finding her watch and feeling good about it.

You begin the story where Paula found that she had lost her watch.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 4.

Charlie had just moved in that day and did not know anyone. Charlie wanted to have friends in the neighbourhood.

The story ends with Charlie having many good friends and feeling at home in the neighbourhood.

You begin the story with Charlie in her room immediately after arriving in the neighbourhood.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 5

During the Nazi occupation a man's wife and children were viciously tortured and killed by an SS trooper, and the man swore revenge.

The story begins one day after the war, when the man enters a restaurant and sees the ex- SS trooper.

The story ends with the man killing the SS trooper. You begin when he sees the SS trooper.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 6.

One day Alison saw a gorgeous guy she had never seen before while eating in a restaurant. She was immediately attracted to him.

The story ends when they get married.

You begin when Alison first notices the guy in the restaurant.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 7

Anna needed money badly. The story begins one day when she notices a valuable diamond in a shop window. Anna decides to steal it.

The story ends when she succeeds in stealing the diamond.

You begin when she sees the diamond.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 8.

Janice noticed that her friends seemed to be avoiding her. Janice wanted to have friends and be liked.

The story ends when Janice's friends like her again.

You begin where she first notices her friends avoiding her.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 9

One day Gina was standing around with some other people when one of them said something very nasty to her. Gina got very mad, so mad she decided to get even with the other person.

The story ends with Gina being happy because she got even.

You begin the story when Gina decided to get even.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 10

Jody is having trouble getting along with her boss at work. Jody is very unhappy about this.

The story ends with Jody's boss liking her.

You begin the story where Jody isn't getting along with her boss.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(Not at all applicable)   1   2   3   4   5 (very applicable)

APPENDIX 16 EAMPLE OF PAIRED SCENARIOS RESPONSES

Group 1: Pilot group 6 x females (25, 27, 28, 29, 25, 23, 27)

Pair 1.

1. Found yourself unemployed
2. Logged into Facebook and found that someone had left a nasty message and this leaves you feeling upset.
3. You are feeling lonely, you see an advert for match.com
4. You come home after shopping and find you have lost your mobile phone.
5. Go to Local Park with the kids and find that it is unsafe.

Pair 2

1. Scenario two from original
2. Scenario 1 but not community, to school or work or something
3. You decide you want to loose weight.
4. Scenario 10, change to colleagues who you work in a team with frequently.
5. Change scenario 7 to benefit fraud
6. Family are having a dispute because youngest son has dropped out of school.

Pair 3

1. Scenario 1, neighbourhood not very appropriate.
2. You are worried about your mum or dads health, but he or she does not want to go to the doctor.
3. Your rent is due next week, but you don't have enough money to pay it
4. A person in your class has been bullied for the last couple of months and it does not seem to be stopping.
5. You started a new job and you have not made friends with your work colleagues (adjustment to scenario 4).
6. Social media/cyber bullying scenario.

APPENDIX 17 Group Scenario's

Pilot Group
Romantic relationship and how to meet someone new.
New job how to solve problems with colleagues.
Lost phone/purse
Financial problems re paying rent or mortgage.
Making a difference to something that you care about.
Having to support someone, go to doctors or being bullied

Group2
Addiction to technology
Sexuality issues
Unemployment
Student issues, no money to go out, peer pressure, get more money debt.
SN relationships/friends
Homeless (male participants did not agree)
Parents separating

Group 3
Brian has just graduated but is finding it difficult to get a full time job. He is worried about paying the rent now that his student loan payments have stopped.
Teenage girl shares intimate photo with boyfriend, they split up, he shares it, you see this image, you know her, what do you do?
Employer, without changing terms and conditions pressurises employee to stay late to complete increased workload whilst at the same time reminding them they are lucky to have a job in this economic crisis.
You notice items have gone missing from an elderly relatives home, the only other people entering the house are the carers.
You hear a neighbour screaming and lots of noise from next door. This is not the first time you've had concerns about your neighbour. Do you phone the police, intervene yourself or do nothing?
You check your bank balance on-line and find £250 bas been taken for a paypal transaction that you haven't made, what do you do?

Group 4
Being too scared to go to the doctors about a recurring problem
Being too nice to say no and taken out of your comfort zone
Alice did not like his mums boyfriend as they never spoke
Ryan fell out with Daniel as Daniel hangs out with his girlfriend all the time. Daniel never answers his calls.
Newton has been homeless for 3 months and has the option to go home or to get a place in a shelter.
Sally is emotional because her boyfriend hits her and she doesn't leave the house.

Group 5
Social networking. The impact consequences; confidentiality; and communication.
Employment. Opportunities – lack off; career options limited; moving; and maintaining.
Friends – worried about addictions or responsible use (drugs or alcohol).
Money. Financial mismanagement; income insecurity; employment reduced salary; cost of living; fraud.
Citizenship\respect – dealing with lack of respect for property or doing the right thing.
Elderly care responsibility or complex family relationships

APPENDIX 18 FG QUESIONNAIRE FOR ROUND 2

Scenario 1

You love your partner very much, but recently you have been having a lot of arguments and you want to do something to make things better between you both.

The story ends with things being better between you.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)   1   2   3   4   5 (very applicable

)

Scenario 2.

You come home after being out and realise that you have lost your wallet/purse or mobile.

The story ends with you finding your wallet/purse or mobile.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 3.

You have just moved home and want to meet new people in the area.

The story ends with you knowing new people in the area

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 4.

You notice that your friends seem to be avoiding you and you want things to be how they were previously.

The story ends with all being well between you and your friends again.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 5.

You are having problems getting along with a colleague at work.

The story ends with you and your colleague getting along well.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 6.

You realise that money is tight this month and you are going to have problems paying an important bill.

The story ends with you being able to pay the bill.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)　　1　　　　2　　　　3　　　　4　　　　5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)　　1　　　2　　　3　　　4　　　5 (very applicable)

Scenario 7.

You and a friend have been messaging by text and you are upset by something they have written.

The story ends with you being no longer upset.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)　　1　　　　2　　　　3　　　　4　　　　5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)　　1　　　2　　　3　　　4　　　5 (very applicable)

Scenario 8.

You are worried about the health of a close friend or relative and you are not sure what to do.*The story ends with you no longer being worried about your close friend/relative's health.*

How easy or difficult is it for you to imagine being in this situation?

(very difficult)　　1　　　　2　　　　3　　　　4　　　　5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)　　1　　　2　　　3　　　4　　　5 (very applicable)

Scenario 9

A friend has been repeatedly letting you down recently.

The story ends with you no longer feeling let down.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)   1   2   3   4   5 (very applicable)

Scenario 10.

You have been really worried about what other people think of you.

The story ends with you feeling less worried about what others think of you.

How easy or difficult is it for you to imagine being in this situation?

(very difficult)   1   2   3   4   5 (very easy)

How applicable is the above scenario in today's society?

(not at all applicable)   1   2   3   4   5 (very applicable)

APPENDIX 19: MEPS-R CODING FRAMEWORK FOR NEW SCENARIOS

Individual means

An individual 'means' is scored for each discrete step, which is effective in enabling the hero of the story to reach the resolution stage or to overcome an obstacle preventing the hero from reaching the goal in the story. (Platt and Spivak, 1975).

In order to identify individual 'means' a list of categories have been established for each new scenario.

The following categories represent discrete steps for each scenario, each category represents a distinct type of action that might be taken in order to achieve the story ending, that is, a category corresponds to a discrete step. If a participant suggests multiple actions belonging to a single category, these constitute a single step and are then counted as one means.

Scenario 6
Money is going to be tight this month, as you have received an unexpected bill. The story ends with you being able to pay all your bills.

Categories:

Budget: Participants often use different language, which still represents the category of budget. Examples of this include' look at income and outgoings; make a budget/plan; look at finances

Example: 'work out finances; budget' this would be scored one as one means step.

Cutting back: This can include quite a variety of suggestions; the following were the most common.
- Do not go out as much/cancel nights out
- Eat what in freezer/cupboards
- Spend less on food/buy cheaper brands

Many participants go into detail with more than one suggestion; we scored a means for each separate area where participants stated they would cut back. For example, if they say 'cut back on nights out, wine, food' this would be scored as 3 means. If they simply said 'cut back on things' this would be scored as 1 means.

By budgeting out unnecessary purchases (e.g. alcohol, clothes, dvds etc) I should be able to save enough money for the unexpected bill. (3 means)

I would cut down on spending money on things I don't need. (1 means)

Strategies: Participants mention many different strategies for being able to pay all their bills; these are some of the most common ones.
- Pay bill in installments

- Pay less or minimum for other bills
- Delay payment on some things till next month
- Move money around
- Sell some things
- Use savings
- Work extra hours or shifts
- Pay for some things on credit card

Participants are scored 1 means for each strategy mentioned. Some participants go into detail about what they would sell, we have generally scored this as 1 means.

Borrow Money: Participants talk about approaching various people or organisations. We generally scored 1 means for 'borrow money from family or friends' however if the participant said 'try to borrow money from family and if not try friends' this would be scored as 2 means. Other methods are mentioned, get a bank loan, extend overdraft or pay for some things on credit card. These again were generally scored as an additional means.

Non-relevant means
- Praying
- Check the bill is right
- Plan so not in situation again
- Understand the bill
- Look at it later

Issues/discussion points

Younger people seem to struggle with lack of budgeting experience. Some student's still living with parents (example of response 'if I had any bills to pay')

Scenario 7

You and a friend have been messaging or texting and you are upset by something that they have written. The story ends with you no longer being upset

Introspection: Previous researchers have only scored introspection when it is followed up with action, in these new scenarios introspection has been scored introspection as 1 means step. The rationale for this is that it seems a valid way to start dealing with an interpersonal problem. When an individual introspects they are gaining a better grasp of their reasons behind their feelings when faced with a situation. They can then think certain thoughts and then choose which way to respond to those thoughts and this may be inaction. By talking about their thoughts the person is not being impulsive but pragmatic in weighing up all the factors in the scenario. Therefore, these justifications lead to scoring introspection as 1 means step.

An example 'Think about what said; Am I being oversensitive or paranoid; try to understand why they would say that'. This would be scored 1 means.

1. **Establish Contact**: This can include, call them or arrange to meet up

Have a discussion: Participants then go into detail regarding what they would say to the person which are then scored as sub-categories, for example, 'ask them what they meant'; 'tell them you found it upsetting'; 'ask them what is going on for them'; 'try to see from their perspective'; 'ask them to be more considerate in future; 'ask for an apology'; make a joke of it with them.

Apologise is a sub-category because most participants recognise that when someone has said something upsetting part of the process to feeling better about the situation is to receive an apology from the person. So, 'they will understand and apologise' would be scored as 1 means step. If they state 'and if they apologise I'd be alright' this would not be scored as a means step.

A key point to bare in mind when scoring apology is that *a clear expectation or request* for an apology must be stated by the participant for a means step to be scored.

Rationalise it: Participants often mention things like be pragmatic and realise you have been friends a long time This probably should go into introspection and be scored as a separate means step.

Avoidance: Participants often talk about 'avoiding the person for a while and then talk to them' instances like this are scored as a means step as this is seen as being a functional way to cope with a difficult situation. It is vital that the participant is clear that they then intend to resume communication with the person. These strategies are not to be scored as a means step when there is no future intention to resume communication for example 'stop being their friend'

Speak to a third party: Participants sometimes state that they would seek

the advice of a third party, this can involve, friends or family**.**

Non-relevant means

- Stop being friend
- Leave it

Limitations/discussion

Re-read the message in case taken the wrong way?

Lots of people go into detail about the 'problem with texting' in this scenario.

Scenario 8
You are worried about the health of a close friend or relative and you are not sure what to do. The story ends with you being less worried about your close friend/relative's health.

Categories

Introspection: As before, in addition this scenario would include 'observing the individual to see if suspicions are correct'.

Speak to third party: This can include professionals or other friends and relatives. Again if participants go into detail and say they would talk to a friend first, then Google and then go to a doctor to get advice this would be scored 3 means; get more information for self or for them.

Discussion: Ask them what you can do to support them, tell them you are worried, ask them if there is a problem.

Participants go into details about different things they can do that would help them feeling less worried. These strategies have been broken down into the following categories.

Contact: This can include, spend time with them; keep in regular contact.

Support: Just be there for them; encourage them to see a professional, offer to go with them to doctor; pray/meditate or chant with for them.

Again all of the above categories can be scored with sub-categories within as people often go into detail of the different things that they would do within each of those categories.

Cognitive restructuring: Participants often talk about cognitive strategies to help them cope with the situation. An example would include 'worry less and accept it is out of my control' this would be scored as a mean step when it is processed by the participant after they have had a conversation with the individual or other friends/family.

Non-relevant means

- Worry less accept out of my control

- Observe first to see if suspicions correct

- Send a card

Limitations/discussion
Can be ambiguous as does not state how good a friend they are and some participants have commented on this.

Scenario 9
Recently, a friend has been repeatedly letting you down. The story ends with you no longer feeling let down.

Categories

Introspection: As before

Discussion: As with previous scenarios this can involve much detail about how they would tackle the problem when they do talk to the friend. The details are then scored as sub-categories and 1 means is scored for each one. Examples are: talk to friend, confront friend, seek explanation, tell them how feel, tell them been missing their company, look for understanding and seek a solution.

Cognitive restructuring: Participants also talk about changing their attitude towards the friend, which is a way to deal with something that you may have no control over. When this is stated, after having a conversation, it is then scored as a mean step. This can also

include stop trusting them and try to be more flexible with them or just let it go.

Modifying behavior: Some participants talk about doing something nice for them or for both of them to do something nice together. It is difficult to categorise these strategies but it could effectively be viewed as reaching out to them in the way that you behave. It is therefore accepted as a means step as perhaps the participant feels that they are doing all they can to support the friendship.

No longer be their friend: When language similar to this is used we have generally scored it as a means step. An example is 'if the situation does not change then I would no longer be their friend', or 'rely on other friends'

The rationale here is that they are attempting to deal with the situation, which is in response to the ending, and it is accepted then that this would be a realistic step to take. Importantly, this would be scored as an non-effective mean when not backed up with any other problems solving strategies.

'**Take a step back and wait for them to contact you**.

Non-effective Means
  • Try to please them more

Limitations/discussion
Perhaps the ending is wrong with this scenario as it is easy for people to say 'just no longer be friends with them' so you are not getting a true reflection from them. Despite emphasis on it being 'the ideal strategy' this seems to be forgotten by participants. The majority of participants do respond in details it could be related to their mood.

Scenario 10.
You have been really worried about what a friend thinks about you. The story ends with you feeling less worried about what your friend thinks about you.

Introspection
As this is an intrapersonal scenario it was felt that scoring for introspection should be different to that of previous scenarios (where introspection was always scored one means, regardless of whether they put this into action). It was agreed that if an individual went onto a different train of thought during introspection then that would score a second point. Examples include, consider things from the other person's perspective and watch your friend's behaviour when they are around you.
'Praying' was classified as a form of introspection in this scenario (other scenario's it has been scored as an ineffective mean).
It is also worthy of note that an adequate response does require some level of introspection first

Avoidance: Some participants use avoidance as a positive step to take in order to gain perspective on the situation. However, not all cases of avoidance can be scored as 1 means step; some participants mention it just to avoid the situation, as a way to deal with it, in other words just ignore it. It was agreed that ignoring the problem completely would then *not* be counted as 1 means step. The rationale here is that avoiding something does not mean that you do not worry about it. Indeed, the literature on coping shows us that avoidance coping is a dysfunctional form of coping.

Cognitive restructuring: Participants talk about changing his or her attitude to the person, rationalising this as 'not everyone can like you' or 'it is not worth being upset about so ignore it'. We felt that this could be an effective means step but would score low on effectiveness. It is reasonable to assume, that by changing your attitude to a situation you have no control over, is a reasonable way to cope with a situation.

Difficulties arise here when the participant does not back up their statement with any rationale, for example: 'just ignore what others think of you'; 'it does not matter what other people think of me' in these instances those statements would <u>not</u> be scored as a means step.

Discussion: Can include talk to the person about it; discuss anxieties; talk through problems; seek reassurance; listen to friend; apologise; ask if done anything to upset them; seek a resolution; probe friend discretely to ascertain their opinion of me; change behaviour.

Speak to third party: talk to other friends; speak to a profession
Some participants talk about 'boosting own confidence' or building up my self-esteem'. When such statements are given as a strategy it is important that obvious steps back up these strategies. In other words clear statements are made about how that action would help you feel less worried. Otherwise they are to be scored as a non-effective mean.

Non-effective means
> Worry for a while; Cast problem to back of mind; Don't care what other people think; Relaxation techniques; Praying/chanting; Be kind to them