

The relationships between problem-solving, optimism and suicidal ideation

**Hoping that suicide isn't the solution: A Moderation and Mediation Study of
Optimism, Problem-Solving and Suicidal Ideation**

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For my Dad

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Abstract

Background: Suicide is one of the world's biggest killers and significant effort has been put in to prevention. Efforts have focused on awareness programmes and restricting the means, with varying results. Interventions aimed at those in immediate risk are brief, with short-term aims and little consideration given to relapse prevention. An increase in the popularity of positive psychology may lead to a new approach to suicide prevention. The framework of positive psychology is built on identifying and improving a person's skills and strengths. Two strengths that have an impact on suicidality are problem-solving and optimism. However, how these two interact has never been studied empirically, despite the fluid vulnerability theory of suicide hypothesising a relationship. This theory states that a person will become suicidal if they are not optimistic about the outcomes of events in their lives and are unable to think of alternative ways to cope. Therefore, the current study aims to investigate how the relationship between optimism and suicidality is affected by the inclusion of problem-solving ability. This is to clarify this relationship to inform the creation of suicide prevention interventions with long-term impact, addressing not just immediate risk but also the on-going wellbeing of the individual. This approach is more in line with the humanistic principles that underpin counselling psychology. **Methods:** An adult population of 216 was recruited through online social media. The participants completed an online questionnaire of measures of optimism, social problem-solving and suicidal ideation. **Results:** Negative correlations were found between optimism and suicidal ideation, and problem-solving and suicidal ideation. In addition, age was found to be positively correlated with optimism and was treated as a covariable. No moderation or mediation effect of problem-solving was found on the relationship between optimism and suicidal ideation. There was a mediating effect of optimism found on the relationship between problem-solving and suicidal ideation. **Conclusion:** The factors of problem-solving and optimism both influence the likeliness of suicidal ideation and should therefore be considered in suicide prevention planning. The implications for practice and recommendations for future research are discussed.

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1. Introduction

The Office for National Statistics recently reported some good news, that the rate of male suicide was the lowest it has been since 1981 (Rudgard, 2018). This drop has been in part contributed to prevention campaigns, such as those run by the Zero Suicide alliance (Zero Suicide Alliance 2018), who have been asking the NHS to pledge to work towards zero suicides, while also providing prevention training. Although some have been critical about this approach, there has been evidence of success, such as that reported by a health care centre in Detroit where a new approach lowered the suicide rate to zero for a three-year period, in a depressed population (Miekle & Wintour 2015).

However, this still meant that suicide was the biggest killer of men under 45 in the UK in 2017 (Office for National Statistics 2017), and worldwide kills more people than murders and wars combined, equating to one every 40 seconds (Le Gales-Camus 2006). Yet suicide does not carry the same awareness as other big killers such as heart disease and cancer.

Furthermore, it is not just the human cost that can cause concern, it is the economic one as well. Overall suicide rates are on the rise (Chang, Stuckler, Yip & Gunnell 2013) and each suicide can cost around £1 million due to investigations, coroners court and serious incident reports (Clayton & Barcelo 1999).

At a time when mental health services have been cut at an estimated rate of 8% in the previous coalition government (Buchanan 2015) this may not reflect a real saving.

This goes to show the importance of suicide prevention efforts, however, most traditional suicide prevention has been focused on managing risk factors, such as age, gender and access to means by which to kill oneself (Kendell 1998, Florentine & Crane 2010). Although these are important factors to consider, they only capture one point in time and are not recovery or future focused. There also seems to be an emphasis on awareness programmes, that may or may not reach the

The relationships between problem-solving, optimism and suicidal ideation appropriate audience, and brief interventions that aim to reduce immediate risk, rather than longer term recovery. In addition, these interventions are adapted from more general approaches, rather than purpose built for the suicidal individual.

The previously mentioned, depression care program in Detroit, looked not only at risk factors and management, but also better training for clinicians, better access to support and specific interventions for those at different levels of risk. The service has reported no suicide for the first three years after implementation of the novel approach (Hampton 2010). This shows that suicide is preventable, and interventions can be used to alleviate suicidal ideation; however, it is worth noting that this was for a population with private health insurance and would therefore not reflect the full range of patients that present in an NHS setting.

This not only raises issues of how to apply this in the UK but also questions what aspects of a person need to be targeted in order to reduce suicidal ideation. An emerging area of research lies in positive psychology (PP), this discipline looks at what skills and qualities 'healthy' people have and uses these aspects to further improve wellbeing. Although it seems to have predominantly found many applications in organisation psychology, to help businesses improve their productivity by capitalising on and motivating their employees, it is increasingly finding application in the therapy world, including offender rehabilitation (Magyar-Moe 2009, Mapham & Hefferon 2012).

A review of the literature indicates that two key contributing factors to suicidality are optimism and problem-solving, both of which can be seen as skills that can be built on and improved. These are qualities that are seen as strengths that can be enhanced, meaning that they fit in with the principle of positive psychology.

It seems that the more optimistic a person is, the less likely they are to take their own life. This refers to how likely a person is to believe events will have a positive outcome and change things for the better. If a person can see little hope of positive outcomes and changes, they are more likely to see suicide as an option. This has

The relationships between problem-solving, optimism and suicidal ideation been observed in a number of populations (Hirsch, Conner, & Duberstein 2007, Bryan, Ray-Sannerud, Morrow, & Etienne 2013).

However, there is evidence to suggest that optimism can be learnt through an intervention based on cognitive behavioural principles (Seligman 1991). This implies that suicide may be prevented by tailoring an intervention based on improving optimism.

On a deeper level one can only be positive about an outcome, when one has thought of a course of action to change one's situation. This involves a degree of problem-solving ability. The existing research seems to suggest that this is the case. It seems that a person with a high level of problem-solving ability will be able to consider and try many solutions, meaning that they are less likely to resort to suicide when compared to others who are unable to think of alternatives. It is also known that problem-solving ability is affected by mood (Hagger, Kuhbander & Pekrun 2014) and there is a problem-solving model of depression (Nezu & Ronan 1985). Further research has indicated a link not only to depression but suicidality as well (Jollant, Lawrence, Olie, Guillaume & Courtet 2011). Yet this too has been found to improve with targeted intervention, which had positive results for a range of psychological disorders (Nezu 2007). The relationship of problem-solving with suicidality was found to be consistent across ethnicities (Hirsch, Change & Jelic 2012). It was also found to be consistent across time, with it being related to family history of suicide (Jelic, Sharp, Champman, Brown & Beck 2005).

The two factors of problem-solving and optimism are brought together in the suicide mode theory (Rudd 2006) which suggest that some who is less optimistic is only likely to become suicidal, or activate the suicide mode, if they cannot think of alternatives.

Despite this logical theory, the relationship between the two factors of problem solving and optimism has never been examined empirically. Therefore, after a review of current literature, a study is proposed to examine how the relationship

The relationships between problem-solving, optimism and suicidal ideation between optimism and suicidality is affected by the inclusion of problem-solving ability.

All clinicians have to deal with risk, including counselling psychologists, thus the better informed on factors contributing to risk, the more confident a clinician will be regarding the decisions they make. Resulting in a better outcome for the client. Yet the current approach of risk management, which looks for the absence or presence of certain factors, does not match well with the counselling psychology philosophy, based on the humanistic principles of understanding the individual and being with them. Trying to understand characteristics and skills that can contribute to risk will allow counselling psychologists to better understand the meaning making the client brings about suicide and their whole context.

The hope is that this research will form the basis on which future interventions can be developed which prioritise the right areas for intervention, that not only lower immediate risk, but encourage long lasting recovery and wellbeing.

An in-depth review of the literature summarised above, is preceded by a reflective statement that outlines the reasons for perusing this topic, and suggested influences this has had on the current research. The review is concluded with the rationale of the research carried out, followed by a short summary of other factors known to influence suicidality but not considered in the current study.

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2. Reflexive statement

For as long as I can remember I have wanted to be a psychologist. I gain my sense of value and personal worth by supporting others to improve their wellbeing and use more of their potential. I believe that this desire to improve wellbeing and enhance potential is also the crux of the aims of a counselling psychologist. This alignment in values and aims, between myself and counselling psychology led to my choice to train as a counselling psychologist. At the heart of this is a desire to see people increase their quality of life. This means there must be a life to improve, suicide would obviously conflict with this. Therefore, suicide prevention can be considered a key part of a counselling psychologist, as well as other professional roles, whose essence is supporting people and improving their subjective wellbeing. What follows is a reflection on why I chose to research the topic of suicide and why I have done it in the way that I have.

Although I have in the past had thoughts of life not being worth living, I have never crossed the line in to action. Therefore, the causes that result in a person being at such a point of utter despair and pain that they *do* cross that line in to action is both terrifying and intriguing.

The enormity of the issue was first brought to my attention by a billboard campaign run by the charity CALM that simply said the 'strong silent dead type' and another that compared the number of military men who had died since beginning of the Iraq war (2003) compared to the amount who had completed suicide in Britain in same period. At the time (2006) this was a comparison of 102 military deaths vs 3054 suicides.

This sparked my interest and after doing my own reading I was saddened to discover that suicide was, at that time, the second biggest killer of men under 35. Now it is the biggest killer of men under 45 (Office of National Statistics 2017). I remember at the time there was a lot of news coverage of the military deaths as the figure had just surpassed 100, and although any death is tragic, it made me

The relationships between problem-solving, optimism and suicidal ideation wonder why such a big killer, suicide, was given so little media coverage. Although there has been an increase in awareness with campaigns such as Project 84 (CALM, 2018) and the zero suicide alliance (Zero Suicide Alliance 2018), the funding for suicide prevention research still lags way behind other big killers, for example, 22 times more is spent, per person affected, on cancer research than on mental health research (MQ Transforming Mental Health, 2015).

Suicide, as I perceive it, is such a powerful projection of suffering and an act that to me, as it is choice driven, is both the most preventable and the least preventable at the same time. It seems to be that it is a final act of a state mind that need not be permanent. I think it may be this paradox that makes people shy away from suicide as an issue, which is reflected in the lack of funding. However, what seems like a paradox, is that for me, being able to actively do something which I believe is helping, in turn allows me to deal with the uncomfortable feelings of helplessness that stem from the issues of suicide.

Unfortunately, the feelings of helplessness I speak of have come from personal experience of suicide. In 2014 my neighbour killed himself and it was I and a friend of his, who discovered him. I experienced the raw aftermath that ensued, the pain that I witnessed in those he left behind has been harrowing. This was not helped by realising that in my neighbour's case, practitioners did not recognise all the risk factors and contributors to his previous serious suicide attempt, meaning he was left without the recovery focused support that he desperately needed.

The experience with my neighbour has made me very uncomfortable with the phrase often banded about: 'if someone is going to kill themselves there is nothing we can do'. Although I recognise the grain of truth in this, sitting with the status quo, rather than pushing forward to understand the phenomenon, does not seem right to me. I believe it is important to be continually learning to better equip practitioners to not only recognise risk, but to act to lower this risk and save more lives.

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In a recent BBC Horizon programme looking at male suicide, an advocate of the zero-suicide initiative, Dr Cathy Frank, stated that 'if you don't aim for zero where do you set the level, how do you decide who is and isn't saveable?' (Hewit, 2018). I agree with her words and believe a zero-suicide approach is the only way to combat the complacency that can breed amongst practitioners and services which a 'can't save them all' attitude can cause.

It has been quite hard to research this topic as it is very close to me emotionally and throughout the research I kept being reminded of what happened with my neighbour. Nonetheless, whenever I engaged, it has also been cathartic and felt like a positive and proactive use of my energy, like I am doing something to help. This seemed to counteract the feeling of powerlessness I have been feeling in relation to my neighbour and at the realisation of the enormity of the issue.

This need to help and my full belief, not only in the recovery approach in care (Anthony 1993), but also in the personal recovery process of individuals, has led me to research suicide from the perspective of positive psychology (PP). In the same way that medical science looks for solutions to illness by examining healthy function, I believe that much can be achieved by looking at those who are 'mentally healthy' to create interventions that can help increase these skills and qualities that make people more resilient against mental ill health.

The recovery approach is important to me as I have seen what an impact it can have on a service user through introducing new perspectives. The fact that service-users can have a proactive part in creating their own picture of recovery, really empowers them and can drive forward the recovery process. This has been a very rewarding part of my previous job as a support worker and in my experience gained as a trainee counselling psychologist. If I lost my belief in recovery I think it would lead to a quick burn out and a deterioration in the care I give; especially as I believe a big duty of the mental health practitioner, whatever the discipline, is to help to instil hope in those they care for. I believe that an increased incorporation of PP theory in NHS mental health care would contribute to change the culture of

The relationships between problem-solving, optimism and suicidal ideation reactive care, which treats the immediate need but does facilitate sustainable long-lasting improvements in wellbeing. I believe that this culture may be a consequence of burnout and a lack of focus on recovery created from the climate of austerity and cuts to services. This shift in culture could potentially lead to better outcomes for service users, better job satisfaction for staff and make services more cost effective.

Furthermore, the philosophy of PP is in the line with the humanistic principles of counselling psychology (Robbins 2008). This philosophy suggests that people have an intrinsic desire to self-actualise, to be their best selves, which of course is in opposition to the loss of perspective that suicide usually follows (Rogers 2004). It could be advocated that there is a need for more individualised care that can allow people to explore what self-actualisation means for them. This belief in a desire for self-actualisation is also at the heart of counselling psychology. Through this research I hope to better understand how to help people achieve this by preventing suicides.

However, I am aware how currently there are barriers to individualised care due to the current climate of underfunding and understaffed services. The consequences of underfunded and understaffed services are that the type and quality of crisis interventions, that are available in community and inpatient based mental health services, can be negatively impacted. This can lead to a revolving door effect where the same patients are seen again and again, of which some services have reported a rise of, as service-users are not receiving the totality of care they need (Jeppesen, Christensen, & Vestergaard 2016). From my experience interventions available in crisis settings are often enough to lessen the crisis but not enough to stop reoccurrence. This can not only lead to the eventual death of the patient, but also to staff burnout, as they may not feel that they are doing what they have trained to do, help make people better. In fact, a recent report showed that 1 in 8 mental health staff had left the NHS in past year, with many quoting understaffing and stress as reasons to leave (Campbell 2018).

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My hope is that through my research and other similar projects that look to better understand the skills and strengths that protect an individual from suicide, a better understanding of preventative care may be achieved. The patterns and relationships that may be found between skills and strengths and suicidality could better inform counselling psychologists and other clinicians, as to what interventions an individual would benefit from and when. This could also lead to new interventions being created or novel uses of pre-existing interventions that target characteristics that have been found to influence suicidality.

This would move suicide prevention away from a narrative of risk factors and symptoms of mental illness and towards a PP philosophy of care. The PP philosophy of therapy is to focus on mental health, a graded judgement of wellbeing, rather than focus on mental illness that is either absent or present (Moneta 2014). Thus service-users could be helped to flourish, rather than to have an absence of symptoms. This is important as completers of suicide do not always have a psychiatric diagnosis or have more than one (Arsenault-Lapierre, Kim, & Turecki 2004). Therefore, which diagnosis or symptom should be targeted to prevent a possible suicide attempt? This question has led some to recognition of the need for a more psychosocial approach to suicide prevention (Fleischmann, Bertolote, Belfer, & Beautrais 2005).

The aim of helping a person flourish is more long-term than crisis interventions and could also be used with individuals who are not suicidal. This could help to improve their wellbeing and social context. Thus, if a person is fulfilling their potential they are less likely to become suicidal in the long term (Koivumaa-Honkanen, Honkanen, Koskenvuo, & Kapiro 2003). Therefore, longer-term focused interventions that are born from research that show, which strengths and skills are related to suicidality, but also help an individual self-actualise, could be considered proactive prevention. This proactive approach could in turn lessen the need for crisis interventions and free up resources within emergency departments and services. This would not only save money but could prevent staff leaving the NHS as it may improve workload, free up resources to spend on more staff and allow staff to focus more on holistic, rather than, reactive care.

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When it comes to the current research, I am aware that I have a critical realist epistemology, this is the belief that patterns to behaviour and human life are too similar to be coincidental and that through scientific inquiry the mechanisms behind these patterns can be better understood (McDonnell, Lohan, Hyde & Porter 2009). This belief in being able to find relationships through scientific query, that reveal something of human behaviour is why I use a quantitative methodology in the current research. A quantitative methodology allows for data to be collected from many individuals, this often means that findings are deemed to have predictive power. This can then influence the creation of theories and interventions based on the idea that the findings predict human behaviour and thus better our understanding (Langdrige & Hagger Johnson 2013). This is important to me so that better understand of human behaviour is reflected in therapeutic interventions. This ensures that interventions are constantly bettered, and evidence based, in order to bring recovery and a more fulfilling life to a greater range of people. This ties in to my belief that suicide can be prevented and the negative and desperate feelings can and do pass.

The importance of evidence-based interventions is clearly stated by the National institute of clinical excellence (NICE) who clarify what evidence is acceptable in order to justify an intervention being recommended to be used in NHS care (NICE 2014). It is only through NICE approval that any intervention that aims to prevent suicide could be used in NHS and allow patients to benefit. This is not to say that only interventions that can be evidenced to be effective and beneficial but that in order for intervention to reach the most people it needs to be approved by healthcare providers, who often rely on an evidenced-based approach to approve treatments. This is the case in the UK and other countries as they seek to minimise harm and maximise efficiency (Badrinath & Gillam 2012).

I anticipate that this has influenced my literature search, which potentially is more focused on recovery and positive psychology orientated papers. I have throughout tried to be aware of my biases and try to counteract them. I have done so through taking account of authors' limitations of their studies and approaches, searching for

The relationships between problem-solving, optimism and suicidal ideation contradictory papers and asking librarians to help with my search of studies and researchers who might not have had the same biases as me. For example, the believe in recovery approach care and that suicidal feelings are temporary, as well as the idea that patterns can be found in human behaviour. In addition, I have also had an educated lay person read my work to understand their impression of my writing.

I have also tried to avoid my influence on the research by opting to collect the data online. I hoped that this would minimise any influence that the presence of the researcher might have on the participant. However, as the questionnaires were shared on social media, the participants could see photos of myself and although I kept photos the same across the platforms I used, this would still allow people to make assumptions about me. In addition, my friends and family who took part would have known how important the research was to me and what my beliefs are. This might have thus influenced their answers, and the answers of whoever they in turn asked to take part. Therefore, my own biases may have indirectly influenced the data I collected.

I also feel that the way I choose to collect the data and that I chose a quantitative methodology reflects my conflicted feelings toward suicide prevention. Through researching the topic, as stated previously I got to feel that I was proactively helping. Collecting anonymous data online however, allowed me to keep a safe distance from the topic. Hence, I was not overwhelmed by feelings of helplessness or the memories of my personal experience that I might have experienced had I been utilising a qualitative method of research and which may have meant conducting an in-depth interview with someone who had considered suicide.

Finally, I believe my main hope is that by looking further into the skills and strengths that affect suicidality it will allow practitioners to measure risk of suicide in another way rather than self-report or risk factors, which may not reflect how the service user truly feels and does not take into account how the service user may react to a change in circumstances (Bryan & Rudd 2016). The practitioner could

The relationships between problem-solving, optimism and suicidal ideation instead measure an individual's level of problem-solving and or optimism, using pre-existing scales or their own judgement of their work with and formulation of the individual and be empowered to make predictions as to whether the practitioner believes the individual to be at risk of suicide currently or in the future. This will help a practitioner make more informed decisions of what interventions to use with different individuals.

Alternatively, the relationships between problem-solving, optimism and suicidal ideation, explored in this current research may highlight areas that are ripe for developing interventions for due to their potential impact on lowering suicidal ideation and thus preventing suicide.

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3. Review

3.1 Suicide prevention

Suicide prevention has become a priority for many western countries where for young to middle aged adults it is a leading cause of death (Le Gales-Camus 2006, Matsubayashi & Ueda 2011). This includes the UK where the Department of Health produced its own suicide prevention strategy in 2012, this was further supplemented with an update carried out in 2016 which concluded that the strategy was sound but lacked a focus on the quality of implementation (Department of Health 2017).

This may be in part due to the number of different settings that suicide prevention efforts take place in. These include workplace programmes aimed at safeguarding professionals in “at risk” professions, such as the emergency services, or more general workplace awareness programmes (Milner, Page, Spencer-Thomas & Lamotagne 2015). Very few of these programmes have been evaluated and further study is needed to understand their efficacy, however, the ability to evaluate workplace prevention programmes is complicated by the variance in their approach.

In addition, as stated before, workplace programmes seem to be aimed at, “at risk” professions. Yet, looking at the most recent data, occupations with a higher than expected suicide rate include those within agriculture and construction. These occupations are not traditionally seen as high risk and often do not have access to work place programmes (Office of National Statistics 2017). This means that many who need access to support are not currently able to.

Young people are also at risk of suicide and benefit has been shown in prevention programmes in schools, although evidence is limited (Singer, Erbach & Rosen 2018). A lot of these programmes depend upon the school staff to spot at risk pupils, this relies on providing the appropriate time and training for staff at a time when schools have an increasing workload and pressure on funding, which may not be realistic. In addition, further follow up is needed to investigate the benefit

The relationships between problem-solving, optimism and suicidal ideation school prevention programmes bring in terms of a reduction of suicides in the longer term, as the child grows (Brent & Brown 2015).

In healthcare settings there is some evidence to suggest that brief cognitive behaviour therapy (CBT) can reduce suicidal behaviours with at risk populations, such as the military (Bryan and Rudd 2015), and inpatients (Ghahramanlou-Holloway, Neely & Tucker 2015). However, programmes tend to favour short-term interventions, aimed at lowering immediate risk. There is no evidence that these approaches reduce risk long-term. They are also generalised approaches aimed at specific clinical populations, therefore do not take in to consideration the factors that put these populations at risk in the first place. This seems to be an area of research that is lacking.

Although prevention programmes show some benefit, there is wide range in their reported effectiveness, as they seem to only show significant benefit for young people and the elderly, but not for those of working age, who are most risk (Matsubayashi & Ueda 2011). Furthermore, the above programmes are for people who may or may not be suicidal; there is little intervention, if any, in place specifically for those who are actively stating suicidal intent.

The existing evidence on suicide prevention, of those with suicidal intent, focuses mainly on risk management and vulnerabilities, with a short-term aim of lowering immediate risk. For example, in a manual for health practitioners who are dealing with suicidal individuals, only one and half pages addressed protective factors while thirty-four addressed risk factors. The manual's author also stated that they did not think that protective factors had any positive effect when it came to prevention (Chehil and Kutcher 2012).

The impact of this approach is two-fold. Firstly, the focus of existing interventions tends to be on lowering short-term risk, although this may prevent an immediate suicide it might have little impact on any future attempt or completion. Therefore, a longer-term approach is needed if we are to have a meaningful impact of suicide

The relationships between problem-solving, optimism and suicidal ideation prevention, as many who have or attempted or completed suicide, have experienced more than one period of feeling suicidal (Suominen et al. 2004, Hooper et al. 2015). This means that there were potentially opportunities that, had intervention been available, a subsequent and final suicidal episode would not have occurred. In addition, currently, there is little support that interventions aimed at those who have had multiple attempts of suicide have an impact on the numbers of completed suicides, although the interventions evaluated were ill defined (Inagaki et al. 2015).

It may be that to have a longer-term impact on a person's risk of suicide, a shift in approach toward intervention is required from focusing on lowering or negating current risk factors to developing a long-term goal of improving overall wellbeing and reducing the risk of reoccurring suicidal episodes. This shift would also help with the second impact of short-term, risk-focused approaches, which is that it centres on what is wrong with a vulnerable person who is likely to already have low self-worth (Robinson, Kissane, Brooker, Hempton and Burney 2017). These approaches may reinforce already present ideas of being defective and that it would be better if they were dead (Robinson, Kissane, Brooker, Hempton and Burney 2017) and thus be counterproductive.

One way for mental health services to shift to longer-term prevention strategies, while limiting negative messages to service users, would be to focus on the strengths and skills that make a person more resilient to risk factors. This would, in turn, help prevent relapse and allow a person to flourish (Ellis 2006). This is in line with the principals of positive psychology.

3.2 Positive Psychology

The definition of Positive psychology as stated by Watkins (2015) is "The scientific study of the good life" (p3). This simple quote contains two main concepts of positive psychology, first that it is based on scientific investigation and second that it is concerned with understanding and finding ways to build strengths that allow

The relationships between problem-solving, optimism and suicidal ideation individuals and communities to flourish. The former point emphasises the desire of positive psychologist for their work to be backed by research, which allows for positive psychology to be incorporated into practice (Watkins 2015).

To expand on the latter point, Positive psychology was developed as a contrast to what some saw as the negative approach of the disease model. The disease model focuses on how to solve problems or fix what is wrong in order to alleviate suffering. Positive psychology, on the other hand seeks to relieve distress by increasing positive affect through identifying a person's strengths, allowing for skills to develop, and resilience to build. This is not a modern idea, positive psychology returns to the roots of psychology, as the discipline started with the aim of identifying and nurturing talent (Magyar-Moe 2009).

Positive psychology also has its grounding in humanistic psychology. The concept of the self-actualised individual as described by Maslow (1943) in the hierarchy of needs is interested in, as positive psychology is, the conditions needed for a person to flourish, not just be free of illness. Furthermore, issues such as, gratitude, positive qualities, life satisfaction and critique of the medical model of mental illness are all shared concerns for both positive and humanistic psychology (Robbins 2008).

It has been said that the methodology and epistemology are what separates positive and humanistic psychology. With positive psychologists favouring a quantitative methodology, compared to humanistic psychologists' preference for qualitative research. Additionally humanistic psychologists tend to prefer postpositivism epistemology whereas positive psychologists prefer logical positivism (Friedman 2008). However, this argument has been rejected for being too simplistic, with plenty of counter examples. Indeed, it has been said "differences are far outweighed by their similarities" (Linley and Joseph 2004, p. xvi).

The modern-day founder of positive psychology is considered to be Martin Seligman. During his inauguration speech, when he became president of the American psychological society in 1999, he called on psychologists to change what

The relationships between problem-solving, optimism and suicidal ideation he saw as pathology driven modern psychology. Since then positive psychology has seen a recent rapid growth in popularity and application, with the *Journal of positive psychology* starting in 2006 (Magyar-Moe 2009).

However, the positive psychology approach, like the humanistic, has been criticised for being too self-centred and narcissistic, and that research has focused on the benefits of positive psychology on the individual rather than the collective, for which there may be a cost (Norem and Chang 2002, Taylor 2001). On the other hand, it has been argued that when a person flourishes, their context will benefit too and that finding strengths and building resilience can be applied to groups as well as individuals (Hefferon & Boniwell 2011).

One of the most well-known applications of positive psychology is the use of gratitude, particularly in work with depression. It has been shown that those with a greater sense of gratitude report lower levels of depression (Disabato, Kashdan, Short, & Jarden 2016). This led to one of the earlier positive psychology interventions based on attempting to increase a person's gratitude. This is where one is encouraged to document gratitude for what ones has in life or to express gratitude to a person (Emmons & McCullough 2003). A recent meta-analysis showed that the inclusion of a gratitude intervention outperformed a match alternate activity on improving measurements of psychological wellbeing. This effect was small, and the authors questioned whether it was in fact the self-discipline in the intervention that improves psychological wellbeing (Davis et al. 2016). It is important to note that although the effect size was small, all studies involved showed a positive impact for gratitude interventions, for which the authors concluded that further research is needed, with more controlled comparisons conditions, rather than rejection of gratitude interventions.

Other studies have found that gratitude interventions have supplementary benefits such as increasing the likeliness that a client will stay in therapy (Geraghty, Wood & Hyland 2010) and may improve overall life satisfaction (Seligman, Steen, Park & Peterson 2005). Yet there is little research into psychotherapy where the main aim

The relationships between problem-solving, optimism and suicidal ideation is to increase gratitude, rather most research looks at gratitude as one positive psychology intervention within a bigger course of treatment.

There have been attempts at using a positive psychology approach in whole programmes. For example, the principles of PP have been applied to offender rehabilitation, in what has been called the good lives desistance model (GLM-D). This model focuses on establishing a person's strengths based on their values, to help them reach goals that provide benefit to the individual, such as belonging to a community. The main principle being that if a person has a 'good life' they will not commit crime (Ward & Brown 2004).

In one study an intervention based on the GLM-D, was delivered to 14 ex-offenders, resulting in an increase in agency, empowerment and an improvement in relationships. They agreed that this fostered desistance from crime as the ex-offenders found new ways to create meaning and success in their lives (Mapham & Hefferon 2012). Although carried out on a small sample, and with no long term follow up to measure reoffending, the preliminary positive results highlight how PP can potentially benefit the community through lowering reoffending. It is also a promising application of positive psychology which may encourage other applications in a wide number of contexts. This includes areas often seen as quite negative, such as offender rehabilitation and indicates that other areas, such as suicide prevention, may benefit from a positive psychology framework.

3.3 Optimism

One of the main characteristics that is investigated in positive psychology is optimism, as it is seen as an important psychological resource (Magyar-Moe 2009). Optimism is defined as hopefulness and confidence about the future and success of something (Oxford dictionary n.d.).

In positive psychology this has involved looking at a person's explanatory style, this is how a person explains the influences and causes of positive and negative events

The relationships between problem-solving, optimism and suicidal ideation in their life. Explanatory style is based on three dimensions, whether someone sees events as caused by themselves or others (internal vs external), where these are permanent or short lived (stable vs unstable), and whether they affect everything or are context specific (global vs specific) (Seligman 1991). Someone who is optimistic is theorised to have an explanatory style that describes negative events as external, unstable and specific (Buchanan & Seligman 1995).

Research has shown numerous benefits of being an optimist, for example a meta-analysis showed that optimism is positively correlated with athletic performance (Ortin-Montero, Martinez-Rodriguez, Reche, Garces de los Fayos-Ruiz & Gonzalez-Hernandez 2018), as well benefits for physical health outcomes in patients with pacemakers (Habibovic et al. 2018). It has also been shown that a person who is classed as an optimist experiences less depression and anxiety, adapts better to negative life events and reports more health promoting behaviour (Boniwell 2012).

This positive impact on wellbeing, that optimism seems to have, raises questions around how optimism is developed in an individual. An important factor that has been identified, is secure maternal attachment. It appears that a more secure attachment in childhood leads to a greater sense of an internal locus of control as an adolescence, which promotes higher levels of optimism into adulthood (Renaud, Barker Hendricks, Putnick & Bornstein 2019). In addition the level of autonomy given to a child can influence how optimism develops, with children given little autonomy having lower levels of optimism and those with a moderately controlling mother having the highest levels (Hasan and Power 2002). This further implies the importance of secure attachment, providing boundaries and a foundation from which children can explore the world, in order to develop optimism. However the authors of the study warn that genetic inheritance may explain the association of levels of optimism between mother and child, rather than socialisation influences and that further research was needed to clarify the link found.

The occurrence of childhood trauma, in particular maltreatment, has also been shown to negatively affect levels of optimism in adulthood, which was associated

The relationships between problem-solving, optimism and suicidal ideation with an increase in the diagnosis of affective disorders (Broekhof et al. 2015). This supports other research of optimism's benefits on wellbeing but could also suggest a protective factor against illness. As the research mentioned was a correlation design it may be that trauma negatively impacts levels of optimism or that higher levels of optimism protect against the negative effects of trauma.

There is some evidence for this theory of optimism as a protective factor against psychological distress. Lucas, Kraines and Wells (2018) found, using eye-tracking, that people who rated themselves as optimistic paid less attention to upsetting or threatening information. They theorised that the difference in focus of attention between optimists and pessimists was a possible pathway of distress. Those who are less optimistic will dwell on distressing information leading to psychological distress. However, there are issues of causation, in that does being optimistic make you pay less attention to distressing information or does paying less attention make one optimistic.

This ambiguity around optimism was also argued by Davidson and Prkachin (1997), they believed that not enough is known about the different aspects of optimism and how they interact with other characteristics such as extroversion, confidence, anxiety and neuroticism to be able to claim it is a universal benefit and that some optimism may cause harm by being unrealistic.

Norem and Chang (2002) go further, describing the possible benefits of being a pessimist through a concept that they call defensive pessimism. This is a strategy used by anxious people when pursuing important goals. It involves having unrealistically low expectations and reflecting on all possible outcomes of an event. Research has shown that defensive pessimists and optimists perform the same on tasks, but that optimists are more satisfied and are in a better mood. It was also found that improving the mood of defensive pessimist impairs performance (Spencer & Norem 1996). Yet it was also found that anxious people who employ a defensive pessimist strategy do better than anxious people who do not (Norem 2002). Therefore it is argued that an intervention to challenge a defensive

The relationships between problem-solving, optimism and suicidal ideation pessimist and increase optimism would be counter-productive as it would negatively impact performance.

It is important to note that anxious defensive pessimists and optimists performed the same but the optimist had other benefits such as greater satisfaction and better mood. Therefore, it could be argued that addressing a person's anxiety first, to alleviate the stress and exertion caused by being overly anxious, would allow them to lessen their reliance on defensive pessimism as a coping strategy. At which point they may benefit from interventions to increase their optimism and experience the satisfaction and better mood that the optimists enjoyed. Yet this pathway has not been explored or researched, despite the known negative impacts of anxiety. This highlights the downside of not embracing the counselling psychology philosophy of pluralism and complexity (Woolfe, Dryden & Strawbridge 2003).

This also raises the question of whether optimism can be taught. Martin Seligman's book 'Learned optimism' (1991), was based on the idea that by challenging a person's explanatory style, optimism can be taught. This involved asking a person to distract and distance themselves from their pessimistic thinking styles about events. Seligman argued that disputing this thinking style was the true way to change a pessimist to an optimist. This was achieved by looking at beliefs about events and learning to argue with yourself. This involved looking at the evidence, implications, and usefulness of alternative explanations of events. Seligman developed a practical model that could be used in a therapeutic setting. This was further built on through a process Seligman called 'externalising the voices' so that an individual could practice disputing without the need to wait for a triggering event or without a therapist present, to empower the individual and result in long lasting change.

It has been shown that optimism training like this can lower the risk of adolescents having subsequent depressive episodes (Peterson 2000). This effect was also seen in adults, even after a two year follow up (Seligman, Schulman, DeRubeis & Hollon 1999). It should be noted that the decrease in depressive episodes should

The relationships between problem-solving, optimism and suicidal ideation not be the only concern of a positive psychologist, who should also be considering the overall well-being of the person.

It is worth noting that most research carried out on the effectiveness of learned optimism training has been carried out by Seligman himself and therefore cannot be called truly objective. This may have influenced how controlled conditions were managed, how data was analysed or the participants that were included or excluded in the research. This could have led to a positive bias in the reported research that looked favourably on the optimism interventions. However, a recent meta-analysis of randomised control trials of intervention aimed at increasing optimism, not just the one proposed by Seligman, showed a moderate effect size (Malouff & Schutte 2017). This indicates that interventions can successfully increase optimism.

A strength of Seligman's approach is that it is based on disputing oneself, a core concept in CBT, where one learns to challenge one's own thoughts (Seligman 2002). This has been shown to be effective in changing a negative explanatory style and treating depression (Beck, Rush, Shaw, & Emery 1979).

A limitation of the approach that optimism can be learned, is that it does not take into account any possible biological aspects of how a person uses, develops and experiences optimism and mood. Some research does imply a genetic heritability of optimism that cannot be explained by familial shared life events (Zuckerman 2001). Despite the limitation, the research suggests that optimism can be improved through intervention and that there are both physical and mental health benefits of being an optimist.

3.3.1 Optimism and Suicidal Ideation

Optimism has also been shown to be highly associated with suicidal ideation and behaviour in a number of populations including and the military (Bryan, Ray-Sannerud, Morrow & Etienne 2013), and among students (Hirsch, Conner & Duberstein 2007). In both studies it was found that greater optimism was

The relationships between problem-solving, optimism and suicidal ideation associated with lower suicidal ideation. Bryan and his colleagues also found that optimism weakens the effect of hopelessness, which has also been shown to be a key predictor of suicidal ideation (Hirsch et al 2006).

The relationship between optimism and suicidal ideation has also been found to be consistent across ethnicities. Yu and Chang (2016) found that ratings of optimism and pessimism predicted the suicidal ideation of Latino and Black students. However, the effect was not statistically significant for Asian students, which indicated that further research is needed in this population. It is also worth noting that all the participants in the study were living in the same country so cannot be generalised to those living within different cultures. Despite this limitation there seems to be enough similar findings from differing populations, to accept that optimism is a key factor underlying suicidal ideation.

Furthermore, Hirsch, Nsamenang, Chang and Kaslow (2014), looked at another factor that seems to be mediated by optimism. In this study spiritual well-being and depressive symptoms were analysed in female African American suicide attempters, using self-reported measures. They found that spiritual well-being was negatively correlated with depressive symptoms, this implies that a more spiritual person would be less likely to complete suicide. Yet this relationship was partially mediated by optimism. This indicates that better spiritual wellbeing is only related to depressive symptoms due its relationship with optimism, which in turn is negatively correlated with depressive symptoms. This could potentially mean that optimism is a more fundamental factor that can lessen the likelihood of suicide attempts, however this finding is limited by the correlational nature of this type of study which does not identify causation.

Furthermore, this research was carried out with past suicide attempters, it was looking at depressive symptoms rather than suicidal ideation or motivation. It is an assumption that increased depressive symptoms in suicide attempters is reflective of an increase in their suicidal motivation, therefore it cannot be taken as clear

The relationships between problem-solving, optimism and suicidal ideation evidence of a fundamental factor associated with suicidal behaviour and motivation.

Optimism has been further scrutinised by looking at whether it can be broken down into composite parts of thoughts about self, world and future. Chang, et al. (2013), looked at whether a belief in a changeable future can augment the prediction of depressive symptoms and suicidal behaviour. They argued that future orientation and optimism were separate concepts. This is despite having a large and positive association with each other, based on the amount of variance they shared. This was reported as about a quarter, which was felt to be low enough for the two measures to be defined as separate concepts.

In spite of this, they did not find the addition of future orientation to optimism statistically significantly improved prediction of suicidal behaviour. This can be seen as further evidence that optimism is the fundamental factor that influences suicidal behaviour, due to the lack of impact that future orientation has on its own as a predictor of suicidal behaviour.

Though Chang et al. (2013) did find a moderating effect of future orientation on the relationship between optimism and suicidal behaviour, the findings showed a strong positive correlation, as well as a large amount of shared variance between future orientation and optimism. This could indicate that the two concepts actually measuring the same thing. This implies that future orientation is an aspect of optimism, rather than a separate concept and could explain the observed moderating effect, as measuring future orientation may be increasing the accuracy of the measurement of optimism.

3.4 Problem-solving

Another skill that positive psychologists have investigated is problem-solving. The Oxford dictionary defines this as 'finding solutions to difficult and complex issues'

The relationships between problem-solving, optimism and suicidal ideation (online Oxford dictionary). This can range from logical problem-solving, such as maths problems, or social problems, such as knowing how to meet new people.

Such a skill appears to be one that can affect many different aspects of life. This includes reactions to an emergency situation, where it was found that people who appraised their problem-solving as more effective were more likely to get out of a simulated air crash (Cassidy 2002). Although it is worth noting that it was a simulated exercise and there was the added incentive of a money reward and it was therefore not a true reflection of real-world application. However, simulating a real-world situation would be unethical and is therefore impossible to replicate in a research setting.

Problem-solving has also been linked to educational outcomes, where it was found that those who self-appraised their problem-solving skills as more effective were likely to achieve higher grades (Elliot, Godshall, Shrout & Witty 1990). Although this was with academically unprepared children enrolled on a development course. Therefore the findings cannot be separated from the impact that the development course had on grades rather than problem-solving ability. Yet it could be argued that those who rate their problem-solving highly are better able to benefit from such courses.

Interestingly problem-solving ability has been associated with a number of personality traits, most notably extraversion, conscientiousness, and agreeableness. It was found that overall those with higher problem-solving abilities were more social, open, and preferred more structure (Elliott & Herrick 1995). Yet it is unclear whether better problem-solving increases sociability and openness or vice versa.

Despite this correlation to personality type and therefore genetics, it has been shown that problem-solving ability can be improved through training. A study looking at a group program for 7-8 year olds showed a significant improvement in social problem-solving at the end the program (Erwin & Ruane 1993). A further

The relationships between problem-solving, optimism and suicidal ideation study of this program replicated these results but found that they did not improve the social standing of the children implying little real-world benefit. Furthermore, it was found that positive behaviour within the groups was correlated to a bigger improvement in problem-solving, implying that those who were well behaved were better able to learn and thus improve skills (Erwin, Purves & Johannes 2005). These findings do imply that problem-solving is not a fixed skill purely dictated by personality type but that it can be improved upon. Yet as with any intervention it is affected by the participants' engagement, which could be argued, can be determined by personality type, among other factors.

The links of problem-solving to personality type and educational outcome infer that developmental factors are important to the formation of this skill.

It has been identified that a number of conditions need to be present to allow for optimal development of problem-solving skills. These include parental warmth, modelling of good listening skills and parents asking guiding questions rather than taking over of tasks. In addition, parental hostility and restrictiveness are known to hamper the development of problem-solving (Martin, Stack, Serbin, Schwartzman & Ledingham 2012). The above-mentioned conditions are also known to affect attachment style of infants and it has been shown that those who display a secure attachment style have better problem-solving skills (Arslan, Arslan & Ari 2012). The influence of the environment is further emphasised when the impact of childhood trauma on problem-solving ability is considered. It has been shown that an increase in emotional and physical trauma lead to a lowering of problem-solving skills in both the general population (Özen, Subaşı, Yildirim, Baştürk & Yasin Bez 2010) and non-violent and violent offenders (Kitei 2006).

Another factor known to affect problem-solving ability is mood. Hagger, Kuhbander and Pekrun (2014) asked participants to solve problems that could only be solved with the same complex strategy. They were then primed with either a negative or positive affect and were then asked to solve similar problems. This time however the problems also had a simpler solution. Those primed with negative affect were less likely to spot the new simpler strategy. This shows that negative affect has the

The relationships between problem-solving, optimism and suicidal ideation effect of narrowing one's view, which in turn, can affect one's behaviour and thinking style.

This effect has been postulated to affect the development of depression, leading to a problem-solving model of depression as hypothesised by Nezu and Ronan (1985). This was developed in response to what they saw as the oversimplified model of negative life events causing depression, which research suggested only account for around 10% variance in the prediction of depression. Nezu and Ronan also note that people can be under extreme life stress and not develop depression.

The problem-solving depression model was building on previous work by Nezu that indicated that problem-solving ability negated the effect of current life stress. This model incorporates negative life events, current problems and problem-solving ability and their effect on depression symptomology. It was hypothesised that problem-solving ability would directly affect depression symptoms as well as having an indirect effect through the relationship between current problems and depression via problem-solving. This is that the higher the problem-solving ability the lower the rates of depression, and that the effect of current problems on the severity of depression will depend on one's problem-solving ability.

The problem-solving model of depression has been found to support the predication of anxiety, a result that has not been replicated for negative life events (Miner & Dowd 1996). This adds weight to the integrity of the model as anxiety and depression are highly comorbid (Hirschfeld 2001).

Nezu and Ronan (1985) carried out a study on undergraduates, measuring each of the three factors which the model theorises to impact; depression, life stress, current problems and problem-solving ability. The findings showed that the model accounted for 42% of the variance in the prediction of depression symptoms. However, they note that the study was carried out using self-report measures and future research would benefit from behavioural measures. A further limitation was

The relationships between problem-solving, optimism and suicidal ideation that it was carried out on students and would need to be carried out on a clinical population to establish validity.

This second limitation was addressed in a study carried out on a group diagnosed with major depressive disorder and controls, who were asked to self-appraise their problem-solving skills and complete a Beck depression inventory. The results suggested a significant correlation with depression and appraisal of problem-solving, furthermore the depressed group rated themselves significantly worse than the controls on problem-solving ability (Nezu 1986).

As mentioned above, as problem-solving is affected by affect and that it is a significant predictor of depression, it is no surprise that a therapy aimed at improving this skill exists. It was first developed by D’Zurilla and Goldfried (1971), they developed a training program for people who presented with difficulty to cope with day-to-day problems. This has subsequently been developed by Nezu, Nezu and D’Zurilla (2013) to incorporate new findings in outcome research, affective neuroscience and cognitive psychology. This is known as contemporary problem-solving therapy (PST).

This therapy is built on CBT principles; the approach aims to give clients tools or cognitive and behavioural skills to help deal with a wide variety of life stressors, with the aim of improving physical and mental health outcomes. A main principle is that distress and mental health symptoms are caused by an inability to cope with life stress. It aims to teach more effective problem-solving skills and attitudes such as self-efficacy, awareness, emotional regulation and purposeful problem-solving, in order to improve resilience to stress and move toward important life goals (Nezu, Nezu & Colosimo 2015). This is well suited with the objectives of positive psychology that aim to build resilience and allow a person to flourish.

A review of problem-solving therapy outcome literature (Nezu 2007) concluded that it is an effective intervention for many psychological and physical disorders and it is flexible enough to be delivered in a number of ways including individual, group and

The relationships between problem-solving, optimism and suicidal ideation for those with learning difficulties. Though it was pointed out that there was a wide difference in the methodology of the studies reviewed. It indicated that not all studies used a measure of problem-solving abilities, which calls into question whether it can be used to support the efficacy of PST if there is no record on the impact on problem-solving abilities.

Furthermore, it was noted that very few studies carried out an investigation into what extent the clinicians delivering the intervention adhered to the treatment, therefore it cannot be said conclusively that it was PST that caused the improvement, or if it was the therapeutic relationship established between the clinician and clients that led to the improvements found.

A further point to note is that the reviewer of the literature is the author of many studies included in the review and is a contributor to the development of the therapy. It could be claimed that there may be a bias to promoting this approach, perhaps seeing their own work in a more favourable light than the results of research suggested. Nonetheless, overall PST does seem to positively impact on a person's ability to alleviate distress.

3.4.1 Problem-Solving and Suicidal Ideation

With the above points in mind it is clear that problem-solving ability affects a number of psychological aspects, one that it has been extensively linked to suicidality. Jollant, Lawrence, Olie, Guillaume and Courtet (2011) conducted a literature review of suicidal behaviour and cognitive deficits; one deficit that was clearly identified was problem-solving. The review also included neuroimaging data which further supported the relationship between suicidal behaviour and problem-solving.

Another study looked at the effect of inducing a negative mood on problem-solving skills of suicide attempters with a history of depression (Williams, Barnhofer, Crane, & Beck 2005). Once a negative mood was induced, solutions to a problem both reduced in number, and became of poorer quality compared to before the

The relationships between problem-solving, optimism and suicidal ideation negative mood was induced. This effect was not found in non-suicide attempters with a history of depression. Although this implies a relationship between problem-solving and mood, it was lowering of mood that impaired problem-solving ability rather than vice versa.

Problem-solving ability also seems to be linked to future behaviour as well as historic. Those who were better skilled at problem-solving were shown to have a decrease in future suicidal ideation (Quinones, Jurska, Fener & Miranda. 2015), this implies that problem-solving is a skill that affects the likeliness of suicidal ideation and behaviour, rather than one that is negatively affected by suicide attempts.

Furthermore, it has been found to be consistent across ethnicities, Hirsch, Change and Jelic (2012) found a relationship between suicidal behaviour and problem-solving in White, Black, Asian and Hispanic participants. Nevertheless, the study was carried out with American college students, therefore it could be argued that they will have a similar background, as opposed to using participants from different countries or with different education levels.

Problem-solving ability has also been linked with family history of suicide (Jelic, Sharp, Champman, Brown & Beck 2005). It is well known that those who have a family history of suicide are themselves more likely to complete suicide (Soresn & Rutter 1991), however, it was found that family history of suicide and current problem-solving ability were also highly related. Jelic et al. (2005) suggested that previous family history may create an environment that inhibited the development of problem-solving skills through modelling suicide as a solution. Although this does further the hypothesis that problem-solving influences suicidal behaviour and not the other way round, this study did not explore how problem-solving is affected by family history and is therefore is only a hypothesis. Jelic et al. do suggest a longitudinal study to test their theory thoroughly.

The relationships between problem-solving, optimism and suicidal ideation

However Rožkar, Zorko, Bucik & Marušič (2007) looked at problem-solving skills between depressed suicide attempters and non-attempters. The patients' problem-solving ability was measured as they were being admitted to an inpatient ward and seven weeks later. This found no difference between the attempters and non-attempters. There was also no change over time in terms of problem-solving skill. This would imply that problem-solving is linked to depression rather than suicidal behaviour.

It is worth noting that the study did not use a current rating of suicidal ideation or behaviour, so the participants were grouped by history of attempt. It may be that some were being admitted for the first time and as they were inpatients they were more likely to be seriously unwell and perhaps highly suicidal for the first time. Therefore a measure of current level of suicidal behaviour and or ideation would be more appropriate.

Yet this is at odds with what was found by a study that was carried out on psychiatric patients by Williams, Barnhofer, Crane and Beck (2005). They found that problem-solving ability only deteriorates after a depressed mood was induced for those who had a history of previous suicide attempts. This implies that problem-solving skill and depression are only related to each other through the relationship between suicide and depression.

3.5 The fluid vulnerability theory of suicidality and the current research

From the above literature it can be concluded that both optimism and problem-solving does indeed influence suicidal ideation and behaviour. However there is little research that includes both characteristics. It is a different story if you change from a positive characteristic of 'optimism' to the negative of 'hopelessness' where there is more investigation of its relationship with problem-solving. In addition, the fluid vulnerability theory as postulated by Rudd (2006) brings these characteristics together in an attempt to explain how people can be suicidal at one point in time

The relationships between problem-solving, optimism and suicidal ideation but not others, despite risk factors remaining constant. It also attempts to explain what may cause a suicidal episode to reoccur in some but not others.

The fluid vulnerability theory is a cognitive behavioural based approach to suicidality and assumes that suicidal episodes are time limited periods that are triggered by precipitants that are either external, such a relationship breakdown or loss of job, or internal, such as a thought, image or feeling. Rudd further theorises that the suicidal mode is made up of four domains. The physiological, what the person is physically feeling, the affective, the person's emotions, the behavioural susceptibility, such as low distress tolerance and lack of self-soothing skills and lastly the cognitive, or as he calls it, the suicide belief system, which Rudd argues is central. These are the processes that make up how the person see themselves, others and the world.

It is believed that the suicidal mode is only activated when the trigger affects or spreads to all four domains. Each domain has factors that make it more susceptible to activation, which will vary across individuals, which in turn will affect threshold at which individuals' suicidal mode will be activated.

The domain that brings together the effects of problem-solving, and hopelessness is the cognitive domain. This, Rudd states is the domain of most importance, stating that it is this domain that is most likely to be triggered and is most appropriate for intervention in clinical practice. As stated above, the cognitive domain relates to all information processing, including an individual's beliefs about the self, others and the world, which if negative, or hopeless, means the domain is more likely to be triggered. A factor, according to Rudd, that makes the cognitive domain more likely to be hopeless is deficits in problem-solving skills.

This pathway to suicidality suggests that problem-solving ability affects how likely someone is to feel hopelessness. This is backed by a number of studies including one that found support for a prediction model for suicidality that included problem-

The relationships between problem-solving, optimism and suicidal ideation solving and hopelessness as predictors for suicidality (D'zuilla, Chang Nottingham & Faccini 1990).

Additionally, in a study that investigated the nature of the relationship between problem-solving, hopelessness and suicidality further, and involved the author of the fluid vulnerability theory, measurements of hopelessness, problem-solving appraisal and suicidal ideation were taken from young adults involved in an outpatient programme. They found that hopelessness predicted the level of suicidal ideation, known as a direct effect and that problem-solving appraisal also predicted suicidal ideation but through its relationship with hopelessness. This is known as an indirect effect, meaning that hopelessness mediates the relationship of problem-solving appraisal and suicidal ideation (Dixon, Heppner & Rudd 1994). This implies that problem-solving is only related to suicidal ideation through its relationship with hopelessness, which in turn is related to suicidal ideation. In other words, the better one is at problem-solving, the less hopeless they will be and therefore less likely to become suicidal.

However, a more recent study found that problem-solving has a different effect on the relationship between hopelessness and suicidal ideation. In this study primary care patients completed measures of social problem-solving, hopelessness and suicidal behaviours. Although they confirmed the above finding that hopelessness predicted suicidal behaviours, social-problem-solving was found to have a moderating effect on this relationship. That is, that when problem-solving skills were low the relationship between hopelessness and suicidal behaviours is strengthened (Walker, Chang & Hirsch 2017). This is support for diathesis-stress-hopelessness of suicidality as postulated by Schotte and Clum (1982), who thought that problem-solving may moderate the effects of stress on hopelessness which then increases suicide ideation.

These two studies suggest different pathways in which problem-solving affects the relationship between hopelessness and suicidal ideation, in either a moderating or mediation role, therefore further investigation is needed. Yet with the increased

The relationships between problem-solving, optimism and suicidal ideation interest in positive psychology and its potential benefits of improving wellbeing with patient populations as explored above, I propose investigating the more positive characteristic of optimism, to move away from the negative approach of illness.

Although Bryan et al. (2013) argue that optimism and hopelessness are separate, albeit related, constructs, in a study of college students it was found that optimism was associated with lower suicidal ideation, even when controlling for hopelessness (Hirsch et al. 2007). Yet the study also found that optimism and hopelessness both predicted roughly the same amount of suicidal ideation, this could imply that they were measuring the same thing. Therefore, in this research optimism and hopelessness will be seen as opposite ends of the same spectrum.

We know that both optimism and hopelessness are predictors of suicidal ideation, however we do not know how, or if, the relationship between optimism and suicidal ideation is affected by problem-solving. Therefore, both mediation and moderation analysis are used in the current research. The research question and hypotheses are laid out below:

What is the relationship between problem-solving, optimism and suicidal ideation?

Therefore, there are a number of hypotheses being tested, these are:

- The relationship between optimism and suicidal ideation will be moderated by problem-solving.
- The relationship between problem-solving and suicidal ideation will be mediated by optimism.
- The relationship between optimism and suicidal ideation will be mediated by problem-solving.

The first two hypotheses reflect the literature as presented on hopelessness, however the third hypothesis is included to investigate the pathway which could be suggested by cognitive vulnerability as laid out in the theory of depression

The relationships between problem-solving, optimism and suicidal ideation (Abramson, Seligman & Tesdale 1978) and expanded on by the fluid vulnerability theory of suicidal episodes (Rudd 2006). This is that beliefs about the world, other, and self are coloured by one's experience. This means that someone who has negative beliefs, or a sense of hopelessness, will interpret all new information through this filter. This would mean problem-solving is less likely to be used and developed as novel situations will be seen as hopeless. Therefore a person would be unable to find solutions to their problems, which in turn may lead them to see suicide as a solution more readily than those who were more hopeful and had developed problem-solving skills. This would suggest that problem-solving mediates the relationship between suicidal ideation and hopelessness.

3.6 Other Factors Relating to Suicide

This research is looking at characteristics of a person that may affect one's likeliness to complete suicide. However, there are other factors and frameworks that are known or theorized to effect suicidal behavior and ideation. A brief discussion of some of these follow.

Firstly, a biological factor thought to influence the likeliness of suicidality is that of the serotonin systems in the brain. Research has shown that people who have a decreased sensitivity to the neurotransmitter serotonin, show increased levels of aggression, including self-destructive aggression (Heeringen 2001). In addition, Consoloni et al. (2018) found that a change in serotonin sensitivity can predict worsening suicidal ideation and suicide attempts among patients with major depressive disorder. The above finding has been seen as a useful biomarker for risk in individuals, however the causes of a change in serotonin sensitivity is unclear, nor is the viability of testing for these changes in a clinical setting, such as the NHS, which is already overstretched.

Another psychobiological factor known to affect suicidal ideation is the memory system. Pollock and Williams (2001) found that those who are suicidal are more likely to have an over-general autobiographical memory. This means that they are

The relationships between problem-solving, optimism and suicidal ideation less likely to recall specific memories, even when prompted, instead producing a more general category of memory such as walking the dog, rather than a specific walk with their dog. The authors of the study thought that the increased levels of suicidality are due to a limited ability to recall adaptive cognitive processes. This inability to recall specific memories when an individual has been able to negotiate problems and/or distress, leaves the individual feeling that they do not have the skills to deal with their current distress, which leads to a wish to escape (Williams, Barnhofer, Crane & Duggan 2006). This could be interpreted as over-general autobiographical memory affecting a person's ability to problem-solve as they are unable to rely on past examples to build on to find solutions. This further highlights the importance of problem-solving and suicidal behaviour, which is explored in the current research.

In most literature the desire to take one's life is described as a want for escape, however, some have questioned this assumption and sought to understand other purposes for wanting to end one's life. This has focused on the idea that an individual may see suicide as a sacrifice for the loved ones around them. This is the idea that the individual puts other's needs above their own, by believing themselves to be a burden to others, thus a solution to this burden would be to take their life. There has been some evidence gathered to support this. Nolle, Gulbas, Kuhlberg and Zayas (2012) found that those who had attempted suicide in the past supported the above view of reasons for their attempt. This not only raised questions about suicide being an escape, but also if family is indeed a protective factor against suicide, or whether family could actually be a motivating factor for suicide. Further research is needed to investigate what may contribute to one seeing suicide as a benefit to their family, rather than the family being a reason not to attempt suicide.

However, the idea of suicide as a self-sacrifice is an individual's attempt to solve what they see as the problem of the strain they have on their families. This once again brings us to the factor considered in the current research, problem-solving, and the way they view themselves, an aspect of which influences one's optimism.

The relationships between problem-solving, optimism and suicidal ideation

Another aspect that some have suggested that there are unconscious motivations at play when someone decides to take their life. These are desires and wishes that an individual would be unable to vocalise, but that have an influence on one's actions. One that Freud theorised is the death instinct, a desire for destruction, directed at the external world, but also often directed inwards (Freud & Strachey 1962). Freud believed that was due to the organism wanted to return to its original inorganic state.

The influence of unconscious motivations is considered further in more contemporary psychoanalytical understandings of suicidal behaviour which also takes into account internal conflict. These internal conflicts can arise from negative experiences in the early attachment of the infant and the primary care giver, such as inadequate meeting of the infant's needs, these difficulties become internalised as part of the infant's sense of self. Then later in life when adverse life events occur, these previous developmental vulnerabilities can be exposed. This can cause reexperiencing of past traumas, which gives them more intensity and meaning, than previously experienced, through a more adult understanding of what occurred. This in turn leads to intolerable pain that needs to be escaped from (Adams 1985).

However, for the individual to become suicidal further unconscious processes must occur. This happens through unsuccessful attempts to contain the painful affect which leads to eventual overload and impairs reality testing. This leads to splitting between the ego and the body with the ego being the good object and the body the bad, which carries the pain of the affect. This leads to fantasies of the ego surviving the death of the body to allow a pain free continuation of existence (The Suicide and Self-Destructive Behaviors Study Group 2018). This had led some to see the suicidal state as quasi-delusional as the finality of death is not understood (Campbell and Hale 2017).

The theorised influence of unconscious motivation has led some to believe that a proportion of car accidents are actually hidden suicides (Selzer & Payne 1962). There has been some evidence that supports this idea, for example a study that

The relationships between problem-solving, optimism and suicidal ideation found those who had single car accidents were more likely to score lower on a measure of reasons for living, than car drivers who have never had an accident (Pompili, Paolo Girardi, Tatarelli, & Tatarelli 2006). Although, there was no difference between the groups of overall suicidal risk (Pompili et al. 2006) However, research and literature in this area is not comprehensive, because of the the difficulty nature involved in studying unconscious motivations due to their very nature of being unknown explicitly. Therefore, I would argue that this line of enquiry is not particularly helpful for clinicians who work in suicide prevention, as not only is it difficult to research, it is not clear what interventions may arise for clinical practice. The current research aims to build a foundation of understanding on which clinical interventions could be built upon and is therefore justified in its stated focus of optimism, problem-solving and suicidal ideation.

Lastly the final theory of suicidal behaviour to be consider is that of the existential framework, known as the existential constructionist theory of suicide (Rogers 2001). This hypothesises that people create core constructs to make sense of and manage the anxiety that arise from the existential conditions of freedom, death, isolation and meaninglessness. These constructs help create a cohesive, goal-directed life narrative for the individual, however these constructs can be challenged by negative life events. The individual will then meaningfully reconstruct these concepts to incorporate their new understanding caused by the life event, to allow their life narrative to be cohesive and thus alleviate distress (Lockman & Servaty-Seib 2018). However, if meaning reconstruction does not or cannot take place the individual is unable to make sense of the world and is left with the accompanying distress which can become overwhelming and lead to a suicidal state (Rogers 2001).

There is some evidence for this theory, with research looking at suicide notes written by those who completed suicide and those that attempted through less violent means and lived, found that those who completed suicide mentioned difficulty in meaning construction more than those who survived their suicide attempt (Rogers, Bromley, McNally, & Lester, 2007). In addition, Holland, Malott,

The relationships between problem-solving, optimism and suicidal ideation and Currier (2014) found that meaning reconstruction was associated with suicidal ideation in veterans moving from military life into education. However, it could be argued that the issue of incorporating new information into core constructs to allow a consistent understanding of existence is a problem to be solved. It could be that inability to solve problems may reflect deficits in meaning reconstruction or vice versa. Or optimism may help people see hope for the future, thus making the process of meaning reconstruction more likely. Therefore, it may be that a better understand of the relationship between problem-solving, optimism and suicidal ideation may add possible avenues of exploration and intervention to improve meaning reconstruction. Thus, the aim of the current study may help practitioners who work in models other than the cognitive behavioural, the model of which underpins the fluid vulnerability theory of suicidality that influenced the current research.

4. Application to Counselling Psychology

Suicide prevention is difficult to approach and achieve when it seems that clinicians have such varying opinions on the subject. One opinion is that people, if deemed to have the mental capacity, should be left to make their decisions about ending their own life, rather than forcing treatment on them to prevent their suicide (Callaghan, Ryan & Kerridge 2013). Yet under the BPS guidelines that apply to counselling psychologists (BPS 2018) it is stated that psychologists need to be aware of any risks a client poses to themselves and if such a risk arises it is a reason to breach confidentiality. Furthermore, psychologists are asked to justify any ethical decisions they make.

Due to the explicit mention of risk that a client can pose to themselves and the nature of the work, particularly for a counselling psychologist, inaction is hard to justify, especially since a suicidal state of mind is seen as temporary (Rudd 2006). Therefore, better understanding of characteristics that influence and contribute to suicide, as is the aim of the current study, would hopefully help counselling psychologists in becoming more aware of what characteristics and attitudes can constitute potential suicidal thinking and contribute to individual risk. This would not only help with deciding what interventions would be appropriate, but also when to breach confidentiality, as this can lead to a rupture in the therapeutic relationship and should only be done when absolutely necessary and when the psychologist is concerned that their suicidal ideation could lead to action.

Furthermore, the discipline of PP, of which the variables in the current study of problem-solving and optimism are taken from, could help counselling psychologists, as well as other clinicians, to have a more robust way to assess risk. It could help to better differentiate between people who are and who are not in imminent risk, yet who have the same risk factors. This could be achieved through

The relationships between problem-solving, optimism and suicidal ideation the better understanding of the characteristics that protect an individual from suicidal behaviours, such as problem-solving capabilities and optimistic traits. It could also allow intervention targets to be identified that align more with the counselling psychology framework. This is because counselling psychology is built on the humanistic principle of seeing the person as a whole, rather than a particular symptomology (or ticking boxes), which is what risk assessment management can sometimes amount to, with little evidence that it is effective (Coffey, Cohen, Faulkner, Hannigan, Simpson, & Barlow 2017). The humanistic principle is also about seeing the person in their context and treating the whole person rather than symptoms and/or diagnosis, irrelevant of the environment people find themselves in. Through identifying skills and characteristics and enriching them, a positive psychology stance, as part of counselling psychology, can add to the person and help build resilience, rather than just focusing on the suicidal crisis or symptoms thereof.

It could be suggested that to approach suicide prevention in this way, allowing for the exploration of a person's strengths and skills in an individualised way, also shows more integrity, a core concept in counselling psychology (Meara, Schmidt & Day 1996). Integrity allows the person to be understood in conjunction with their circumstances and what meaning they personally attach to them, rather than just relying on a risk assessment of those circumstances (Lopez et al 2006). For example, an often cited 'protective factor' is children, but it has also been shown that a suicidal individual can believe that their children would have better lives without them (Cerel, Frey, Maple & Kinner 2016), thus the presence of children contributing to the suicidal crisis. Assessing characteristics such as optimism and problem-solving a clinician can better understand when having children is truly a protective factor and utilise it accordingly in the preventative work with the suicidal individual.

Counselling psychologists are also trained to sit with and explore uncertainty, which contradicts the tick-box exercise of a risk assessment philosophy that aims to negate any risk (Woolfe et al. 2003). This can enable the counselling

The relationships between problem-solving, optimism and suicidal ideation psychologist to help their client reach the full potential of their wellbeing, not just treat the current episode. Through the proposed research a better understanding could emerge of how problem-solving skills and optimism can influence suicide risk. Such Knowledge could potentially give counselling psychologists an idea of where, how and when to target interventions that will have a longer-term impact.

In turn the existence of such knowledge and interventions could alleviate some of the uncertainty and anxiety that arises within counselling psychologists, and other clinicians when working with high risk clients. If counselling psychologists felt that, based on empirical research and theory, they had certain effective interventions to work with, they would hopefully feel more empowered to be able to work with the high-risk clients. Therapists' anxiety can be picked up by clients, which may increase their suicidality as they could perceive this anxiety in their therapists as them having a negative impact on others, which could be interpreted as further proof that they are a burden and others would be better off without them (Shamoon, Lappan & Blow 2017). Hence returning to the earlier point, if therapists' anxiety is alleviated, not only can they be more effective in terms of their care, but also, they are less likely to unwillingly contribute to their clients' suicidal thinking.

Lastly, experiencing a suicide of a client can have a devastating impact on any clinician, including the development of post-traumatic stress disorder (PTSD) (Wright, Borrill, Teers & Cassidy 2006). Therefore, apart from this study hopefully adding to a better understanding of suicide risk and contributing to the suicide of proactive interventions that empower clinicians, it could consequently also lessen the number of professionals being traumatised by a client completing suicide, since hopefully, through better preventative care, there would eventually be fewer deaths from suicide taking place.

5. Methodology

5.1 Epistemology

The critical realist stance, with which I align myself and the current study, strives for truth but also believes that the objective truth cannot be possible due to human biases and mistakes that may obfuscate the truth (McDonnell et al. 2009). Instead our understanding of reality is based on theory and conjecture built by our observations which, as stated previously, are coloured by our interaction with it (Paya 2018). This stance rejects both the determinist view of positivism and the individual meaning of social constructionism as being the sole focus of study for social science.

By taking a critical realist stance this research study is in contrast to the shift occurring in counselling psychology research, where qualitative methodologies are rising in popularity over quantitative approaches (Ponterotto 2005). This shift towards more qualitative research has also caused a shift in epistemology towards that of social constructionism. Social constructivism is the belief that reality is constructed in the mind of the individual, rather than a singular objective constant (Gergen 2009). As counselling psychology emphasises the importance of individual meaning of feelings and perceptions (Woolfe, et al. 2003), it understandable that the social constructionist approach is seen as complimentary to research in the field.

However, it is known that human behaviour has patterns and commonalities that suggest that there is more than individual motivation being the sole explanation. Therefore, critical realism argues that the mechanisms and structures that influence action must be included if one is to generate an adequate explanation of human behaviour (McDonnell, et al. 2009). For example, I have noted the success of shop loyalty schemes which rely on collecting a large amount of data, the analysis of which can lead to predictions about what people are likely to buy in the

The relationships between problem-solving, optimism and suicidal ideation future or how and when they like to shop. This increases the success of any marketing campaigns and increases profit. (Stone 2003). The success of these predictions and marketing would not be possible if there were no discernible patterns that allowed prediction. This approach to using large amounts of data to find patterns and make predictions has recently been used in suicide prevention. Walsh, Riberio and Franklin (2017) collected data on a large number of individuals, analysing more than 500 factors and were able to predict future suicide attempts with a high degree of accuracy. However, the authors state that this does not reveal the full picture and that this information needs to be disseminated to trained clinicians who can then support those deemed to be a high risk with appropriate empathetic and individualised care. I therefore believe it is important for counselling psychologist to be aware of patterns and tendencies to better select and use appropriate interventions at individual level. This could also help better understand clients who may not be able, or wish to, tell us their whole reality. Accepting that there are patterns, one can hopefully make educated guesses to fill in gaps and improve the attention paid and care given.

It was Bhaskar (1989) who proposed the ideas of reality from a critical realist view. He postulated three levels of reality: first the empirical level, which is the events that are observed and perceived. Second the actual level, all events whether perceived or not. And lastly mechanism level, which are the processes and structures that caused events to occur. An example of this would be fruit falling from a tree. The empirical level would be witnessing the fruit fall and the actual level would also include the wind that blew causing the fruit to fall. Then finally the mechanism level is the enzymes and cell changes that allow the fruit to separate from the tree with the force of the wind.

When you compare this example to the complex and competing nature of the mechanisms and processes that underline human behaviour, it becomes clear that it is unlikely that a complete predictive model for individual behaviour and actions will ever be established (McDonnell et al. 2009). This is because mechanisms will be impossible to isolate or even observe, let alone be able to do this without

The relationships between problem-solving, optimism and suicidal ideation interference from human error, assumptions or bias (Danermark, Ekström, Jakobsen & Karlsson 2002). Therefore, there will be aspects that cannot be studied from the actual and mechanism levels, leaving any predictions model incomplete. However, tendencies and generalities can be postulated which can lead to theoretical predictive models, that can make reasonably accurate but not perfect predictions (Lawson 1997).

This room for error and uncertainty is where positivism and critical realism differ, as critical realism accepts that there will be uncertainty and therefore rejects determinism (Danermark et al 2002). This ability to accept uncertainty is why I think that critical realism is compatible with counselling psychology, where we strive to be comfortable sitting with uncertainty (Woolfe et al. 2003) Such striving is rooted in the belief that the gap that uncertainty leaves, can allow for a better understanding of personal meaning making, which leads to growth and change (Orlans & Van Scoyoc 2009). I believe that the stance of critical realism allows for a counselling psychologist to accept evidence-based interventions that are based on correlations between approach and outcome, while also staying aware to the individual need that may waver from the stated deterministic pattern or plan. This should thus hopefully, allow for safe and appropriate care that can also be individualised.

The critical realist stance is compatible with the methodology of the current research, the aim of which is to identify patterns between variables but does not claim causation. This shows that the positivist view is not compatible with the methodology used in the current research, as the patterns and variables analysed could not lead to a causal explanation of suicidal behaviour, as the positivist stance would claim (McDonnell et al 2009). Furthermore, as the shift from quantitative methods to qualitative, in counselling psychology, was a rejection of a purely positivist view, rather than a rejection of all other epistemological stances (Ponterotto 2005), I believe that critical realism is compatible with counselling psychology research.

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In conclusion, this research takes the critical realist stance as the aims and methodology used strive to search for generalities and tendencies in an effort to better understand reality. This does not exclude the emphasis that counselling psychology places on the individual as a critical realist believes there will always be unknowns that cannot be isolated.

5.2 Design

A quantitative methodology is used for this correlational study, using published measures that have been shown to be valid and reliable. This approach has been chosen as the variables being investigated, optimism, suicidal ideation and problem-solving, have been extensively researched and clearly defined (Smith, Breakwell, & Wright 2012). Furthermore, the aim of the study is to investigate the existence and pathways of a general relationship of the variables, rather than a detailed examination of one variable; this is best suited to a quantitative approach.

A study by Ojagbemi (2017) suggested that qualitative research of suicide may be best suited to better understand and highlight those at immediate risk of a suicide attempt, whereas a quantitative approach, may be better at highlighting less direct aspects of risk in a general population from which prevention strategies can be developed.

As this study aims to better understand the characteristics that may make one more susceptible to suicidal ideation, rather than identify individual who are at risk, the above would suggest that a quantitative approach is the most appropriate in this case. The aim is to further the understanding of the characteristics that affect a person's susceptibility to suicidal ideation, rather than focusing on the circumstances of a person e.g. gender, age, family history, which have been extensively researched. The relationships between optimism and suicidal ideation and between problem-solving and suicidal ideation are well established, but how the two may or may not influence each other is unknown. However, some form of interplay has been hypothesised by the suicidal mode theory (Rudd 2006). This

The relationships between problem-solving, optimism and suicidal ideation theory states that a person who is not optimistic will only become suicidal if they have low problem-solving skills.

However, it may be that problem-solving influences how optimistic a person is, i.e. a person is likely to be optimistic if they can consider numerous options in the face of difficulty. Therefore, this research aims to investigate the relationship between optimism and problem-solving and how this impacts the level of suicidal ideation. As the pathway is unclear but several models of relationship have been suggested by the literature, three models were statically tested, as set out below.

5.2.1 Moderation

This examines whether two or more predictor variables have a combined effect on the relationship with the outcome variable, which changes the relationship seen with just one predictor variable.

In this case the two predictor variables are optimism and problem-solving. The model, informed by the suicidal mode theory, tested using moderation is shown in Figure 1.

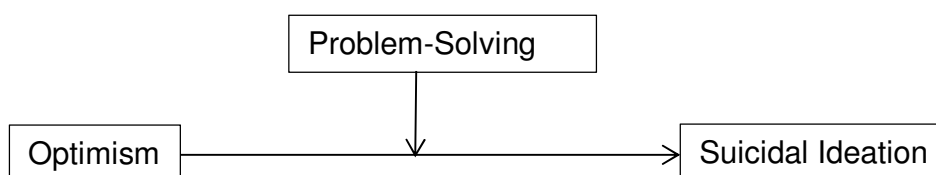


Figure 1. The hypothesis moderation effect of problem-solving on the relationship between optimism and suicidal ideation.

The pathway proposed in Figure 1. is similar to the relationship found by Walker, Chang and Hirsch (2017), however the predictors they used were hopelessness, problem-solving and suicidal behaviors. This relates to hypothesis one.

The relationships between problem-solving, optimism and suicidal ideation

5.2.2 Mediation

However, it could be that the two predictor variables' relationship to the outcome variable can be explained by their relationship through each other. It could be hypothesised that a person is optimistic due to having increased problem-solving abilities, this proposed relationship is shown in Figure 2. This relationship has been hypothesised as Dixon, Heppner and Rudd (1994), found a similar relationship in their study of problem-solving appraisal, hopelessness and suicidal ideation.

Yet it could be that a person has better problem-solving skills due to being more optimistic, this proposed relationship is shown in Figure 3. This has been theorised by cognitive vulnerability theories (Abramson, Seligman & Tesdale 1978, and Rudd 2006).

Therefore, two models were tested using mediation analysis. These are shown in Figures 2 and 3.

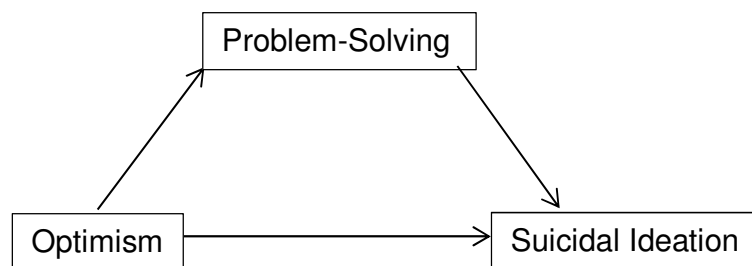


Figure 2. The proposed mediation effect of problem-solving on the relationship between optimism and suicidal ideation

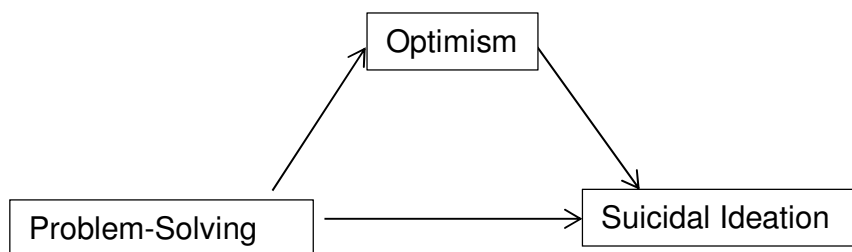


Figure 3. The proposed mediating effect of optimism on the relationship between problem-solving and suicidal ideation

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5.3 Procedures

Participants were directed to a website which hosted the questionnaires. The link was: <https://www.smartsurvey.co.uk/s/opssamf/>

Participants were presented with a full brief (Appendix A) outlining the study, At the end of the page they were asked if they were happy to take part in the research, continuation past this page indicated consent.

The participants were presented with a page asking them demographic information, age, gender and ethnicity. Following this were three questionnaires, one on each page. First was the questionnaire measuring optimism, followed by problem-solving with the measurement of suicidal ideation the last of the three questionnaires. The last page was a full debrief (Appendix B), which included information on organisations the participants could contact if they felt they needed help and support with their suicidal ideation.

The participants were made aware that they could not withdraw their data once the questionnaires were submitted.

5.4 Materials

The three questionnaires used were as follows:

5.4.1. Life Orientation Test (LOT)

Optimism was measured using the revised life orientation test (LOT-R) (Scheier, Carver, & Bridges 1994). This is the most commonly used measure of optimism and is a brief self-report measure ideal for use in research where several measures are being used. It is a continuous measure that is solely used for research rather than in clinical settings. It has been shown to have an acceptable level of retest validity and internal consistency, with a Cronbach's alpha of 0.78.

The questionnaire consists of ten questions. There are three items that measure pessimism, three that measure optimism, and four that act as filler questions. The three questions that measure pessimism are reversed scores. This means that

The relationships between problem-solving, optimism and suicidal ideation scores on the LOT-R can range from 6-20. A higher score indicated higher optimism. The answers were on a five-point Likert scale ranging from 'I agree a lot' to 'I disagree a lot'. Please see Appendix C.

5.4.2 Record Problem-Solving Inventory- Problem-Solving Self-Efficacy and Problem-solving Skills Scale (PSI-PSSE-PSS)

The variable of problem-solving was measured using the Record Problem-Solving Inventory-Problem-Solving Self-Efficacy and Problem-Solving Skills scales (PSI-PSSE, PSI-PSS) (Maydeu-Olivares & D'Zurilla 1997). This measure is a variation of the Problem-solving inventory as developed by Heppner and Peterson (1982). This measure was developed after it was found that the items and constructs in the original measure did not correspond to factors outlined in the model of social problem-solving developed by D'Zurilla and Goldfried (1971). This led Maydeu-Olivares and D'Zurilla to carry out a factor and content analysis and postulated a two-factor fit that correlates with a more recent model of problem solving by Maydeu-Olivares and D'Zurilla, 1996. This implies strong validity as the measure relates to aspects of the theory, suggesting it is measuring what it intended to.

The PSI-PSSE, PSI-PSS has been shown to have internal reliability, correlated to other measures of problem-solving and is convergent from measures of psychopathology (Maydeu-Olivares & D'Zurilla 1997). Although has not been widely used in research and a Cronbach's alpha has not been established. The questionnaire consists of sixteen items, with five questions reversed scored. The answers on a five-point Likert scale, ranging from 'I agree a lot' to 'I disagree a lot'. The range of scores available are 16-80. A higher score indicated higher problem-solving. Please see Appendix D

5.4.3 Scale for Suicidal Ideation (SSI)

Suicidality will be measured using the scale for suicidal ideation (SSI) (Beck, Kovacs & Weissman 1979). This is a 19 item self-report measure. This measures the frequency of suicidal thoughts and behaviours on Likert scale. The measure

The relationships between problem-solving, optimism and suicidal ideation has been used on different populations and has been shown to be able to tell the difference between suicide attempters and non-attempters (Blaton-Lacy 1997). As it is difficult to assess the likelihood of a person attempting suicide, ideation is a more accessible concept, however this measure adds validity by determining suicidal ideation to predict the level of suicide risk and previous suicide attempt.

Furthermore, internal consistency, retest reliability and concurrent validity of this measure have been established, with a Cronbach's alpha of 0.84 (Luxton, Rudd, Reger & Gahm 2001, Chiqueta & Stiles 2006, Ozcelik, Ozdel, Bulut & Orsel 2015). The range of scores available are 19-60, as three questions have four options, the rest have three. A higher score indicated higher suicidal ideation. Please see Appendix E.

5.5 Participants

The participants were gathered from the general population through social media, specifically Facebook and Twitter. The posts made on each site contained information of the level of research, which is a professional doctorate, a brief overview of aims, and a link to the website hosting the questionnaires. When a participant clicked on the link it took them to a full brief outlining the study, continuation past this page indicated consent. Any incomplete questionnaires were not used. In addition, the post encouraged others to share the post, which many did, or posts were directed at relevant organisations, such as the charity Mind. This increased participation and created a snowballing recruitment technique.

The study needed a range of scores from a general population, therefore there was no inclusion or exclusion criteria. It was made clear that it is the responsibility of the participants to make their own decision on whether they felt fit and able to participate based on the brief given at the beginning. The brief outlined the topics that the questionnaires touched upon and meant that those who took part were fully aware of what they are being asked. This allowed for informed consent to be obtained.

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The study aimed to recruit 107 participants, as a minimum, this was calculated using G-power, a free software developed to establish the appropriate sample size based on the statistical parameters set for the study. For this study the power is being set at 0.9 and the significance level being set at 0.05 or 0.0167 with a Bonferroni adjustment (Dunn, 1961) for the number of hypotheses, and effect size of 0.15 (Faul, Erdfelder, Buchner, & Lang, 2008). The effect size is based on previous research which indicated that both optimism and problem-solving show a medium to small effect size in regression analysis with suicidal ideation.

The number of participants were 299, although only 220 of these fully completed the questionnaires, and only fully completed questionnaires were used in the data analysis. A further four participants were not used due being under the age of 18. The mean age of the participants was 35.84, with a range of 19 to 76 years. In total there were 60 males, 152 females and two participants who did not specify their gender, these were controlled for by specifying the gender as missing values for these two participants in SPSS (Brace, Kemp, Snelgar 2016). The participants were also asked to report their ethnicity. In total seven different ethnicities were reported, with White British or White other accounting for 88.4% of participants. The other ethnicities were Indian, other Asian, Black, Latino and mixed race.

5.6 Statistical Analysis

The models laid out above in 5.2.1 and 5.2.2 were investigated using moderation and mediation analysis via process macros (Hayes, 2013) in IBM SPSS software version 25.0 (IBM Corp, 2017). The process macro is a robust statistical model that uses bootstrapping and therefore does not rely on assumptions normally associated with multiple regression, such as multicollinearity and homoscedasticity (Field 2013) and were therefore the data were not tested for these assumptions.

The process of bootstrapping is where data are pulled randomly from the original set and replaced a number of times, in this case 5000 times, this simulates a larger

The relationships between problem-solving, optimism and suicidal ideation sample size in an attempt to calculate the true distribution of the population the data were taken from. This was confounded with the use of bias-corrected and accelerated confidence (BCa CI) which accounts for the spread of data (Field, 2013).

5.7 Ethics

Approval for the study was given in June 2017 by London Metropolitan University. Please see Appendix F for ethics certificate. The main considerations were the potential distress caused by asking participants about their suicidal ideation, therefore participants were warned of this risk in the brief given to them before the questionnaires (Appendix A). At the completion of the questionnaires the clients were presented with a debrief that provided information on where they could seek help and advice (Appendix B).

The questionnaires were carried out online to allow participants to remain anonymous to the researcher. This was to increase the chance that the questions would be answered honestly, as participants may feel the need to answer in a more socially acceptable way if the questionnaire was completed in the presence of the research or they knew that the researcher could identify them.

In addition, the anonymity negated the duty of care the researcher would have if they were aware of which participants had high suicidal ideation (BPS 2018). This would mean the researcher would have to move to the role of clinician. If participants realised this, more individuals who were primarily seeking help, rather than those who were primarily interested in the research may have taken part and thus influenced the data. Furthermore, this approach was designed to minimise the distress that may have been felt if the researcher was aware of those who reported high suicidal ideation, as there may have been worry about the level of risk that the individual was believed to be at.

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The data collected was downloaded from the website and stored on a cloud storage service. The data contained no identifiable information and was handled according to the Data Protection Act 1998.

Due to the features of the website which hosted the questionnaires there was not a way to stop underage participants completing the questionnaires. In supervision it was agreed that any participant that listed their age as being under 18 would not be used in the data analysis.

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6. Results

6.1 The relationships between the variables

The mean, standard deviations and correlations of each variable are shown in Table 1. The mean rating for optimism was 19.07 which is high, considering that the maximum score was 30 (Scheier, Carver & Bridges 1994), indicating that participants saw themselves as optimistic. The mean score for problem-solving was 60.89. When considering the maximum score was 80 (Maydeu-Olivares & D’Zurilla 1997) this implies that the participants saw themselves as good problem-solvers. Finally, the mean rating of suicidal ideation was 26.86. This is in the mid-range compared to the maximum score of 60 (Beck, Kovacs & Weissman 1979).

Table 1.

Mean, Standard deviation, correlation coefficients for each variable

| Variable | Mean | (SD) | 1 | 2 | 3 | 4 |
|-----------------------------------|-------|-------|---|-------|-------|--------|
| 1. Age | 35.84 | 12.30 | - | .21** | .10 | -.11 |
| 2. Optimism(LOT-R) | 19.07 | 4.28 | - | - | .34** | -.56** |
| 3. Problem-solving (PSI-PSSE-PSS) | 60.89 | 9.22 | - | - | - | -.19** |
| 4. Suicidal Ideation(SSI) | 26.86 | 8.24 | - | - | - | - |

Correlations based on 5,000 bootstrap samples with 95% bias corrected and accelerated confidence intervals. * $p < .05$. ** $p < .001$

The range of scores available for each score was as follows, LOT-R 6-20, PSI-PSSE-PSS 16-20 and SSI 16-60.

The ordinal variables of problem-solving, optimism, suicidal ideation and the ratio variable of age were analysed through Pearson r correlations, the results are shown in Table 1. This showed that suicidal ideation was negatively correlated with optimism, $r = .21$, BCA CI $[-.65, -.46]$, $p = .01$ and with problem-solving, $r = .19$, BCA CI $[-.34, -.04]$, $p = .01$. A positive correlation was found between optimism and problem-solving, $r = .34$, BCA CI $[-.21, .45]$, $p = .01$.

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A further positive correlation was found between age and optimism, $r=.21$, BCa CI .07, .34, $p=.01$. This meant that age was a covariate and needed to be controlled for in further analysis, as the relationship between age and the other variables was not of interest in the current study.

The influence of the nominal variables of gender and ethnicity, on the ratio variable of age and the scale variables of optimism, problem-solving and suicidal ideation were investigated using measures of difference. Table 2. shows descriptive statistics for the scale variables grouped by gender and Table 3 show descriptive statistics grouped by ethnicity.

For gender this was done using independent t-tests, with bootstrapping. This showed that the means of males and females were not significantly different for age, $t(212)= -1.10$, $p= .21$, optimism, $t(212)= -.91$, $p= .37$, problem solving, $t(212)= .74$, $p= .46$ or suicidal ideation $t(212)= .78$, $p= .27$.

For Ethnicity this was completed a one-way ANOVA again there were no significant differences found between the means of each ethnicity and each of the variables of age, $F(6,213)= .79$, $p=.58$, optimism, $F(6,213)= 1.67$, $p= .13$, problem solving, $F(6,213)= 1.76$, $p= .11$ or suicidal ideation, $F(6,213)= .33$, $p= .92$.

Table 2.

Descriptive statistics for age optimism, problem-solving and suicidal ideation grouped by gender.

| Variable | Gender | Mean | (SD) | N |
|-------------------|--------|-------|-------|-----|
| Age | Male | 34.35 | 11.23 | 60 |
| | Female | 36.42 | 12.68 | 154 |
| Optimism | Male | 18.65 | 4.12 | 60 |
| | Female | 19.24 | 4.35 | 154 |
| Problem-Solving | Male | 61.63 | 9.30 | 60 |
| | Female | 60.60 | 9.21 | 154 |
| Suicidal Ideation | Male | 27.57 | 8.82 | 60 |
| | female | 26.59 | 8.02 | 154 |

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Table 3.

Correlation coefficients for each variable, of male participants

| Variable | 1 | 2 | 3 | 4 |
|---------------------------------------|---|------|------|--------|
| 1. Age | - | -.03 | -.05 | .13 |
| 2. Optimism(LOT-R) | - | - | .25 | -.56** |
| 3. Problem-solving (PSI- PSSE-PSS) | - | - | - | .56 |
| 4. Suicidal Ideation(SSI) | - | - | - | - |

Correlations based on 5,000 bootstrap samples with 95% bias corrected and accelerated confidence intervals. *p < .05. **p < .001

Table 4.

Descriptive statistics for age optimism, problem-solving and suicidal ideation grouped by ethnicity.

| Ethnicity | N | Age | | Optimism | | Problem Solving | | Suicidal Ideation | |
|-----------|-----|-------|-------|----------|------|-----------------|-------|-------------------|-------|
| | | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| White | 113 | 37.20 | 13.11 | 18.69 | 4.07 | 60.38 | 9.25 | 27.03 | 8.48 |
| British | | | | | | | | | |
| White | 76 | 34.41 | 11.46 | 19.00 | 4.46 | 61.80 | 8.83 | 27.09 | 8.21 |
| other | | | | | | | | | |
| Indian | 8 | 37.63 | 14.59 | 22.13 | 2.36 | 61.63 | 9.88 | 24.13 | 4.45 |
| Mixed | 6 | 30.00 | 4.90 | 19.00 | 3.35 | 53.50 | 11.91 | 27.00 | 9.86 |
| race | | | | | | | | | |
| Other | 5 | 33.00 | 4.90 | 23.20 | 4.15 | 68.60 | 3.65 | 24.20 | 7.43 |
| Asian | | | | | | | | | |
| Black | 4 | 36.25 | 13.86 | 20.00 | 6.68 | 55.50 | 7.90 | 25.00 | 6.68 |
| Latino | 2 | 29.5 | 9.19 | 19.50 | 9.19 | 65.50 | 13.44 | 30.00 | 15.56 |

The relationships between problem-solving, optimism and suicidal ideation

The nominal variables of ethnicity and gender was compared using a cross-tabulation was used to compare the difference between ethnicity and gender. This found that there was not significant difference between ethnicity and gender $X^2(6, N=214) = 6.77, p = .34$. This meant that no other variables apart age need to be accounted for as a covariate in further analysis.

6.2 Process Analysis

Using the Process (Hayes 2013) macro for SPSS, which calculates regression analysis, the following analysis was carried out. First using Model 1 to establish any moderation effects, followed by Model 4 to explore the possible mediation of variables. The data for all three variables were standardised for the analysis, using SPSS.

6.2.1 Moderation

Hypothesis 1- The relationship between optimism and suicidal ideation will be moderated by problem-solving.

The moderation analysis looked at whether problem-solving had a moderating effect on the relationship between optimism and suicidal ideation.

The process macro automatically calculates the interaction of the independent and moderator variable. If this effect is significant, then moderation has occurred (Aguinis & Gottfredson 2010). Table 2 shows that optimism is a significant predictor of suicidal ideation, however problem-solving is not. In addition, there is no moderation effect of optimism, as shown by the interaction of optimism x problem-solving not being significant.

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Table 5.

Moderation analysis of predictors of suicidal ideation

| | b | SE B | t | P |
|----------------------------|------|------|-------|-----|
| Constant | -.01 | .06 | -.12 | .91 |
| Problem-solving (centred) | -.00 | .06 | -.06 | .95 |
| Optimism (centred) | -.56 | .06 | -8.92 | .00 |
| Optimism x Problem-Solving | .02 | .06 | -.16 | .71 |

Note. $R^2=.30$, $p<.01$, Correlations based on 5,000 bootstrap samples with 95% bias corrected and accelerated confidence intervals.

The macro also calculates the simple slopes, which calculate regression analysis at different levels of the moderating variable. These levels are one standard deviation below the mean, the mean, and one standard deviation above the mean (Field 2013). However, as the analysis showed no significant interaction effect the simple slopes were not examined.

The lack of interaction effect shows that Hypothesis 1 should be rejected and the null hypothesis, the relationship between optimism and suicidal ideation is not moderated by problem-solving is accepted.

6.2.2 Mediation

The two mediation models were both analysed using Process macro for SPSS (Hayes 2013). This calculates both the direct and indirect effect of the mediator on the relationship between the independent and dependent variables, using bootstrapping. Indirect effects are calculated using bootstrapped confidence intervals, if the bias-corrected 95% confidence levels (BCa CI) do not include zero then the indirect effect is deemed to be significant (Field 2013).

Hypothesis 2- The relationship between problem-solving and suicidal ideation will be mediated by optimism.

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The results of the mediation analysis of the above hypothesis are shown in the below figure.

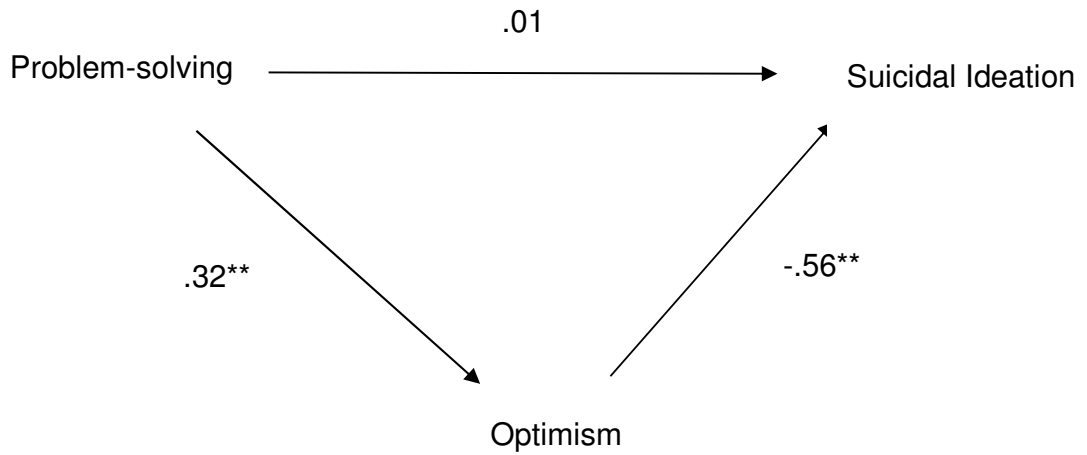


Figure 4. Model of problem-solving as a predictor of suicidal ideation, mediated by optimism.

The total effect was significant, $B = -.18$, $SE = .07$, $p = .00$, whereas the direct effect was not significant, $B = .01$, $SE = .06$, $p = .10$. The indirect effect, through optimism, was shown to be significant, although small, $B = .18$, $BCa\ CI: LL = -.26$, $UL = -.10$). Therefore Hypothesis 2, the relationship between problem-solving and suicidal ideation will be mediated by optimism, has been accepted.

As previously stated, literature suggested that it could in fact be problem-solving that acts as mediator of the relationship between optimism and suicidal ideation, therefore a second mediation analysis was carried out.

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Hypothesis 3- The relationship between optimism and suicidal ideation will be mediated by problem-solving.

The results of the mediation analysis of the above hypothesis are shown below.

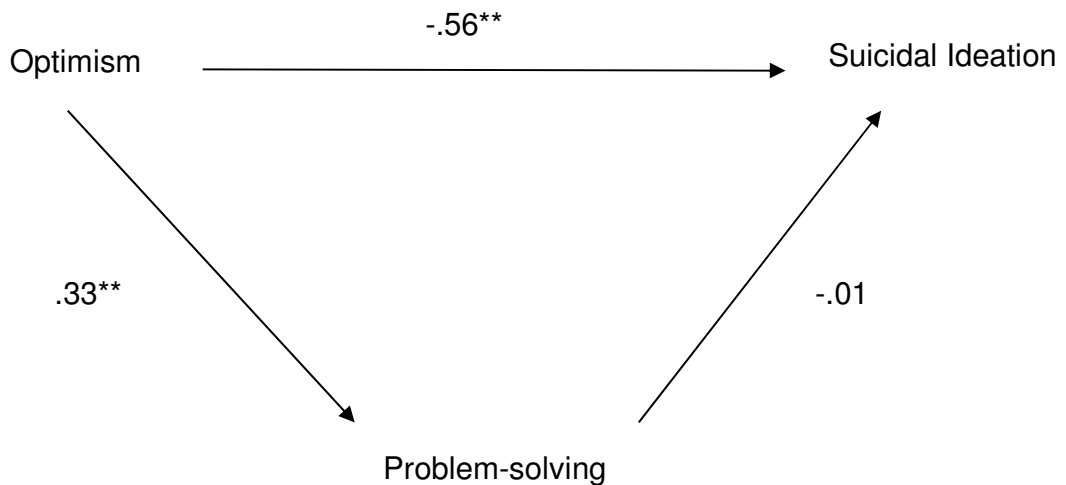


Figure 5. Model of optimism as a predictor of suicidal ideation, mediated by problem-solving.

This shows that while both the total effect, $B = -.56$, $SE = .06$, $p = .00$ and the direct effect, $B = -.56$, $SE = 0.6$, $p = .00$ were significant, the indirect effect was not, $B = .00$ (BCa CI: LL = $-.06$, UL = $.05$). Therefore Hypothesis 3, the relationship between optimism and suicidal ideation will be mediated by problem-solving has been rejected and the null hypothesis has been accepted.

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7. Discussion

7.1 Summary of Findings

This research aimed to investigate the relationship between problem-solving and optimism and its effect on suicidal ideation. This was done through opportunity sampling of a non-clinical population using questionnaires accessed online. The following chapter will summarise the findings from this research, the limitations of this research, implications for counselling psychology, and potential future research will then be discussed.

The main findings were that all variables had averages that were fairly polarised. This meant for problem-solving and optimism, the means were high, indicating that the sample rated both their problem-solving skills and optimism highly. In addition, the average for the suicidal ideation was low, indicated that the sample had low levels suicidality. The scores of the individual questionnaires are discussed further, in context, in the next section.

The correlational analysis found that problem-solving and optimism were positively correlated, thus those with higher problem-solving abilities were more optimistic. It also found that suicidal ideation was negatively correlated with problem-solving and optimism, respectively. This means that as either levels of problem-solving ability or optimism increases, suicidal ideation goes down. An unexpected positive correlation was found between optimism and age, this meant that age was a covariable. These findings are discussed further in the correlations section.

After this, three hypotheses were tested, these were of which two were rejected and one was accepted. The hypothesis that was accepted was, the relationship between problem-solving and suicidal ideation will be mediated by optimism. These results are discussed further, in context of other published research, in the hypothesis sections.

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7.1.1 Findings from the variable measures

Levels of optimism were higher than those found in other research. A Norwegian sample (Schou-Bredal et al. 2017) found an average that was lower, although within a similar range, whereas a UK study (Walsh et al. 2015) found lower levels of optimism amongst respondents from three cities, that was substantially lower than those found in the current study. This implies that the current data comes from an above average optimistic sample, although the samples may not be directly comparable, because the studies mentioned above had a homogenous sample of one country or city, and the current research was carried out online, thus participants from many countries, cultures and background may have taken part, as captured through asking participants to describe their ethnicity.

Levels of problem-solving were also higher than in other research. This is when it has been compared to research where scores were in the mid-range of the maximum score. This was found with a range of populations including, Turkish students (Sahin, Sahin & Heppner 1993), African Americans (Bagley & Copeland 1994) and student teachers (Krug, Love, Mauzey & Dixon 2015). Yet it is worth noting that the average age of participants in the current research at 34.64 is considerably higher than the early twenties found in above mentioned research with carried out with undergraduate students, in addition the range is greater in the current research. The higher age of the participants in this study may be the reason for the higher levels of problem-solving as compared to the above research, although no significant relationship between age and problem-solving was found in the current research.

Furthermore, this research uses a modified version of the problem-solving inventory (PSI) (Heppner & Peterson 1982) whereas the research mentioned used the original PSI, this slightly varied problem-solving scale may have impacted on the scores as the modified version maybe more accurate at measuring problem-solving ability than the original. Yet despite the modified PSI used in this research, directly created from theory and factor analysis of the original PSI. It has not been widely used in research and therefore norms are yet to be established.

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Lastly the level of suicidal ideation appears low when considered against the maximum available score, however the way that the scale for suicidal ideation is structured, any score above 10 is considered significant suicidal ideation that warrants further investigation (Beck, Kovacs & Weissman 1979). Although this does not mean that any score above 10 indicates a person who is at imminent risk of suicide. The measure was developed as tool for clinicians to be able to establish the level of risk amongst patients to better tailor interventions and manage risk.

Yet the measure is also being extensively used in research in its original form, and in a modified version, known as the modified scale of suicidal ideation (MSSI). These scales of suicidal ideation have been used in research with Turkish outpatients (Ozcelik, Ozdel, Bulut & Orsel 2015), African American mothers (Woods, Zimmerman, Carlin, Hill & Kaslow 2013), institutionalised older adults (Sridevi, Tripathi, Kumar & Narayana 2015) and inpatients with a diagnosis and currently in a major depressive episode (Grunebaum et al. 2016). The studies involving Turkish outpatients and African American mothers have scores in the bottom third of available scores, yet the studies with older adults, and those with major depressive episodes had scores in the mid-third. These latter two studies are closer to the levels found in the current research.

The spread of score shows that norms have yet to be established, furthermore across the previously mentioned studies, there seemed to be discrepancies with how the measures were scored. Lastly, the majority of research is carried out with a clinical population, whereas the current research used a non-clinical opportunity sample. Therefore, comparison of the data from this research to the others may be limited, however it does seem that the participants in the current research have a lower level of suicidal ideation than previous research, as might be expected in a non-clinical sample.

7.1.2 Literature examining the relationship between the variables

The current research has found a number of correlations, as expected from previous research. This included the negative correlations found between suicidal

The relationships between problem-solving, optimism and suicidal ideation and problem-solving. This negative relationship has been found in a number of studies with various populations including students (Hirsch et al. 2012) and inpatients (Williams et al. 2005), as well as a study where neuroimaging also suggested a link between problem-solving and suicidal behaviour (Jollant et al. 2011). Walker, Hirsch, Chang and Jelic (2017) found that problem-solving was not only correlated with suicidal behaviours but also moderated the relationship between non-suicidal self-harm and suicidal behaviours. Those who self-harm often go on to attempt suicide, however not all do (Mahadevan, Hawton, & Casey 2010).

The Walker et al. (2017) study suggests that those with better problem-solving ability do not go on to attempt suicide, thus problem-solving ability protects against suicidal intent, rather than all self-harm. This further clarifies the relationship between problem-solving and suicide, as it can be separated from similar variables. This implies that the relationship found in the current research is truly reflecting a negative relationship between problem-solving and suicidal ideation, rather than being confounded by other variables.

It is worth noting that the studies mentioned used student or inpatient populations, whereas the current research used a non-clinical opportunity sample. This increases the generalisability of the relationship between problem-solving and suicide, as it has been found outside of a clinical sample.

Although the Walker et al. (2017) study measured actual attempted suicide, unlike the current research which used a measure of suicidal ideation, the measure used has been found to be a reliable and is closely related to suicidal intent (Beck, Kovacs & Weissman 1979), therefore the relationship that was found between suicidal ideation and problem-solving in the current research can be compared to other studies which found the relationship with suicidal behaviours. In addition, the current research found a negative correlation between optimism and suicidal ideation, this is consistent with a large body of research, some of which has been

The relationships between problem-solving, optimism and suicidal ideation previously mentioned including research involving military personnel (Bray et al. 2013), and students (Hirsch et al 2007).

Furthermore, Ayub (2017) also found the negative relationship between suicidal ideation and problem-solving amongst Pakistani students. This is contrary to what Yu and Chang (2016) found, as although the study confirmed the negative relationship between optimism and suicidal ideation for Latino and Black students, it was not found for Asian students. This could be due to the Yu and Chang study being conducted with Asian-Americans, whereas Ayub's study was conducted in Pakistan, therefore the participants would have different life experiences and cultural pressures (Morling 2016).

In Chang et al. (2017) the negative relationship between optimism and suicidal ideation was found in a Hungarian student population. This is important as Hungary has one of the highest suicide rates in the world (Várník 2012) and therefore indicates a pathway for prevention interventions which are much needed. The authors of the study also state that their findings indicate that optimism and hope are separate and unique protective factors to suicide risk. However, their data shows a large shared variance of around a third between the variables, and although the inclusion of the interaction between optimism and hope better predicted suicidal ideation than either optimism or hope alone, it may be that the two variables together increased the accuracy of the measurement of optimism, rather than indicating two separate variables creating a better prediction model. Therefore, as stated previously, for this study optimism/pessimism and hope/hopelessness are assumed to be part of the same spectrum in order to better augment the findings from the current research in the context of other published work.

The last expected correlation to be discussed is the positive relationship found between problem-solving and optimism. This relationship has been found in other studies including in a population of Spanish trainee social workers (Augusto, Aguilar-Luzon & Salguero 2008), although it could be argued that problem-solving skills and optimism are important qualities for social workers (Dunlap 2013) and

The relationships between problem-solving, optimism and suicidal ideation therefore correlated due to the nature of the population rather than there being a genuine relationship between optimism and problem-solving.

However similar findings have been found in other populations, including older Korean and African American women (Lee & Mason 2013). In this study optimism was found to be correlated with coping style, in particular problem-focus coping, rather than avoidant coping. That is, those who were more optimistic were more likely to try to manage and/or change the situation in order to alleviate distress, thus look for solutions, which is in essence, problem-solving.

Additionally, Zeyrek, Gencoz, Bergman and Lester (2009) found a significant negative correlation between problem-solving and hopelessness with Turkish university students all of similar age and background. The correlation was of medium effect size, which is comparable to the current study. As argued previously optimism can be seen as the positive end of a spectrum, whereas hopelessness is the negative end.

The relationship between problem-solving and optimism/hopelessness seems consistent across cultures and ethnicities, as shown in the above-mentioned studies, as well as the current research which was carried out with the general population.

As mentioned previously an unexpected positive correlation was found between optimism and age. This implies that the older a person gets, the more optimistic they become. This finding has been found in other studies, including Schou-Bredal et al 2017, as mentioned above, and Glaesmer (2012). Although these studies felt the effect size was small, and therefore did not affect their ability to report a norm of optimism for a whole population rather than separating in to age groups. As the current study looked at relationships between variables rather than norms it was felt to be important to include age as a co-variable in analysis to control for this effect, even if small.

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However, Ayub (2017) as mentioned above, found a gender difference in levels of optimism in the older age group of participants. They found that the older age females are less optimistic than males. This is a contrary finding to the current study that found optimism and age to be positively correlated across both genders. Ayub argues that this could be due to the disadvantageous treatment of women as they grow older in the Pakistani culture, specifically the expectation to leave education and get married, a decision often taken by women's parents. It is argued that as the females age they become aware of these differences which in turn effects their optimism. This highlights the importance of considering culture in research findings and their generalisability. In this case the Ayub study questions the relationship between age and optimism but increases the generalisability of the relationship between optimism and suicidal ideation as it continues to be found in different cultures and ethnicities.

7.1.3 The current study's Hypotheses in relation to other findings

Three hypotheses were stated, and following analysis, null hypotheses were accepted for two of the three hypotheses. The experimental hypothesis that was accepted was: The relationship between problem-solving and suicidal ideation will be mediated by optimism. The two rejected experimental hypotheses will be discussed within the context of other findings followed by the accepted hypothesis.

The first hypothesis was that the relationship between optimism and suicidal ideation will be moderated by problem-solving. This hypothesis was based on a study that found problem-solving mediated the relationship between hopelessness and suicidal ideation (Walker, Chang & Hirsch 2017). As argued previously, optimism is an antonym of hopelessness. It was therefore possible that the moderating role of problem-solving would also be found with optimism and suicide ideation, however it would be a negative relationship that would be moderated by problem-solving. That is, as problem-solving ability increased, the relationship between suicidal ideation and optimism would be weakened. Yet in this research no significant interaction was found between the independent variables of problem-solving and optimism. Thus, problem-solving did not have a moderating role in the

The relationships between problem-solving, optimism and suicidal ideation relationship between optimism and suicidal ideation. This was true for all levels of problem-solving.

Although, problem-solving was not found to moderate the relationship between optimism and suicidal ideation, other studies have found that problem-solving moderates other variables' relationship with suicidality. In particular in adolescent populations with a history of negative life events.

For example, a study of adolescents exposed to violence in their neighbourhood and school, but not at home, found that problem-solving moderated the relationship between exposure to violence and psychological distress. That is, those who had been exposed to violence showed lower levels of psychological distress if they had better problem-solving ability (LeBlanc, Self-Brown, Sheppard & Kelley 2011). It is known that both exposure to violence and psychological distress can lead on to further pathology, such as suicidal behaviours (Cromer, Villodas & Chou 2018), therefore the moderating effect of problem-solving seen in the LeBlanc et al. study could be evidence of the mechanism of problem-solving effect on suicidality.

It could be that problem-solving limits psychological distress resulting from exposure to violence so that it does not go on to become suicidal ideation/behaviours. Yet it is worth noting that this study also analysed if problem-solving mediated the negative relationship between violence exposure and positive outcomes, but this was found not to be significant. In the study positive outcomes were defined as aspects such as social adjustment and involvement in risky health behaviours. This means that problem-solving did not affect the relationship between exposure to violence and subsequent behaviours, and as suicide is an action, it may be that problem-solving would not affect the relationship between exposure to violence and suicidal behaviours.

Esposito and Glum (2002) found a moderation effect of problem-solving, this time between the positive relationship of childhood abuse and suicidal ideation and behaviour. This again shows the link between exposure to violence and later

The relationships between problem-solving, optimism and suicidal ideation psychopathology and for this study specifically, suicidality. The study suggested that problem-solving does have moderating role on the relationship between exposure to childhood violence and later suicidal behaviour. The Esposito and Clum, and LeBlanc et al. studies suggest that problem-solving moderates the relationship between suicidality and violent events, rather than cognitive aspects, like those considered in the current study.

Yet Grover et al. (2009) did consider the cognitive factor of stress, both chronic and reaction to life events stress. The study found that problem-solving moderated the relationship between both types of stress and suicidal ideation. This suggests that problem-solving can moderate the relationship between suicidal ideation and cognitive factors, however this is not what was found in the current research, which found no moderation effect of problem-solving. However the Grover et al. study did find that the moderation effect of problem-solving became non-significant when the data was controlled for hopelessness. This suggests that hopelessness is a more important factor than problem-solving when considering the effect of stress on suicidality. This confers with the current study that found that the negative relationship between optimism and suicidal ideation did not change even with the interaction of problem-solving. Both the current research and the Grover et al. study also suggest that problem-solving are related and/or interact but not through moderation.

The current study showed no interaction effect of optimism and problem-solving at all, so it could not be argued, from the data, that optimism could moderate the relationship between problem-solving and suicidal ideation. However it has been found that the relationship between help-seeking, an aspect of problem-solving, and suicidal ideation is moderated by depressive symptoms, of which hopelessness is categorised as a symptom (Wilson & Deane 2010). Although this suggests a moderation effect between problem-solving and optimism, the study is investigating either sub or broader aspects of the variables in the current study and is therefore not directly comparable.

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The second hypothesis that was rejected stated that the relationship between optimism and suicidal ideation will be mediated by problem-solving. This was rejected as the negative relationship between optimism and suicidal ideation persisted even with the inclusion of problem-solving. This therefore does not support the pathway as suggested by the fluid vulnerability theory of suicidality (Rudd 2006). This theory proposes that the occurrence of negative life events may lead one to become less optimistic, or pessimistic, and to perceive all future negative life events as hopeless. This leads to the individual not seeking any solutions to problems and therefore not developing these skills.

However, a study carried out by Bagge, Lamis, Nadroff and Osman (2014) does seem to offer limited support to this theory, although with different measured variables to the current study. Bagge et al. (2014) collected data from a large number of American college students on measures of hopelessness, suicidal ideation and behaviours and reasons for living. Their analysis showed that reasons for living mediated the positive relationship between hopelessness and suicide attempt in the last year. They further split the measure of reasons for living into its component factors and found one factor, coping beliefs, on its own also mediated the relationship between hopelessness and suicide attempt in the last year. The authors argued that coping beliefs were a reflection of the individual's problem-solving ability. Therefore, the Bagge et al. (2014) study supports the hypothesis that the relationship between optimism and suicidal ideation is mediated by problem-solving, which contrasts with the finding of the current study.

There seems to be no other literature that supports this hypothesis, however other studies have found further variables that do appear to mediate the relationship between optimism and/or hopelessness and suicidality and seem to focus on social factors. This includes a 2016 study of North American college students, that found that the relationship between hopelessness and suicidal ideation was mediated by social support (Lamis, Ballard, May & Dvorak 2016). This is that those who reported better social support were less likely to report suicidal ideation despite the presence of hopelessness. The findings imply that perceived social support buffers

The relationships between problem-solving, optimism and suicidal ideation an individual from suicidal ideation. This also suggests that social support, rather than problem-solving (as suggested by the current study) could be a mediator of the negative relationship between optimism and suicidal ideation. Yet it could be argued that the ability to build and utilise social support is a form of problem-solving (Li, Eschenauer & Persaud 2018), and that by measuring perceived social support you are in fact measuring an aspect of problem-solving. This would support the hypothesis that the relationship between optimism and suicidal ideation is mediated by problem-solving, however this is not supported by the current study.

An earlier study that also found that social factors affect the relationship between hopelessness and suicidality was research carried out by Au, Lau and Lee (2009). They found that the negative relationship between depression, of which hopelessness is a symptom, and suicidal ideation was mediated by social self-concept and family cohesion. Those who were depressed but had a more positive self-concept and reported better family cohesion were less likely to have suicidal ideation than those who had a negative self-concept and those who reported family discord. As the current study looked at social problem-solving it could be argued that in order to develop a social self-concept and maintain family cohesion, some social problem-solving skill is needed, and therefore this offers some support for the hypothesis that the relationship between optimism and suicidal ideation is mediated by problem-solving. However, this was not what was found in the current study.

Interestingly a study that looked at the relationship between optimism and relationship satisfaction over two years found that this positive relationship was mediated by cooperative problem-solving (Assad, Donnellan & Conger 2007). It is known that low relationship satisfaction can increase suicide risk (Till, Tran & Niederkrotenthaler 2017). In addition, unresolved relationship conflict has been identified as a common trigger for suicide attempts (Stulz et al. 2018). Therefore, although problem-solving was not found to mediate the relationship between optimism and suicidal ideation it does mediate the relationship between optimism and relationship satisfaction, a known risk factor for suicidal ideation. The

The relationships between problem-solving, optimism and suicidal ideation mechanism for this may be that problem-solving skills help keep levels of unresolved conflicts low.

The literature discussed does not imply a clear mediation effect of problem-solving on the relationship between optimism and suicidal ideation. This is consistent with the current study which found no mediation effect of problem-solving. Although there is some support for problem-solving mediating the relation between optimism and/or hopelessness and other variables that relate to suicidality.

The only experimental hypothesis to be accepted was that the relationship between problem-solving and suicidal ideation will be mediated by optimism. This was due to the analysis of the data finding a significant mediating effect of optimism. In fact, once optimism was included, the relationship between problem-solving and suicidal ideation became non-significant.

This is similar to the findings, as stated previously, by Dixon, Heppner and Rudd (1994), who found that the relationship between problem-solving and suicidal ideation was mediated by hopelessness. This is that problem-solving is only related to suicidal ideation through its impact on hopelessness. The current study found the same relationship, but with the variable of optimism rather than hopelessness. This adds support to the argument that hopelessness is the opposite end of the same continuum as optimism, as well as adding to the literature that clarifies the relationship of problem-solving with suicidality through its impact on other variables.

For example, Chu et al (2018) found that the relationship between problem-solving and suicidal ideation was mediated by two interpersonal variables of thwarted belonging and perceived burdensomeness. This relationship was a robust finding as it was found in five different American populations, students from two universities, homeless adults recruited through a community centre, primary care patients and military personnel. This supports the current study's finding that the relationship between problem-solving and suicidal ideation is an indirect one. It

The relationships between problem-solving, optimism and suicidal ideation may be that problem-solving impacts on a number of factors including cognitive, social and interpersonal factors, which in turn impacts an individual's suicide risk.

It is worth noting that Hagan, Podlogar, Chu and Joiner (2015) also found that thwarted belonging and perceived burdensomeness predicted suicidal ideation, and that this relationship was moderated by hopelessness. It may be that the mediating effect of optimism on the relationship between problem-solving and suicidal ideation found by the current study is a confounding finding due to hopelessness's moderating effect on thwarted belonging and perceived burdensomeness. Hagan et al's (2015) findings indicate a prediction model of suicidality involving the variables of problem-solving, optimism, thwarted belonging and perceived burdensomeness, however further research would be needed to test this theory.

Other studies have suggested different factors that mediated the relationship between problem-solving and suicidal ideation. One study found that this relationship was mediated by feelings of defeat and entrapment. Furthermore, this relationship was not changed when the data was controlled for ratings of hopelessness (Taylor, Wood, Gooding & Tarrier 2010). This contrasts with the findings of the current study, which did find a mediation effect for optimism. In addition, other studies have found a mediating role for hopelessness with relationships between other variables. For example, a study that recruited participants from a CBT trial with a history of childhood sexual abuse (CSA) found that the positive relationship between CSA and suicidal ideation was mediated by hopelessness (Spokas, Wenzel, Stirman, Brown & Beck 2009).

Furthermore, Li, Li, Wang and Bao (2016) found a mediating role for hopelessness in the relationship between parenting style and suicidal ideation. This included parental warmth, behavioural control and psychological control. This mediation effect was found even when the data was controlled for gender, age, family structure and socioeconomic status to negate the influence of these variables on suicidal ideation.

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The current study and previous literature show that both optimism and hopelessness mediate the relationship between problem-solving and suicidal ideation. Therefore, it may be that optimism would also have a mediating effect on the relationships between CSA and parenting style and suicidal ideation, as suggested by the two studies referred to previously.

However, it is worth noting that as demonstrated in the previously mentioned literature, Hopelessness is a strong predictor of suicidal ideation and although the current study found that optimism was a predictor of suicidal ideation, it does not have the same strength as the hopelessness literature. This may be for a few reasons, firstly it may be due to the different measure used in the current study, (LOT-R) to measure optimism, compared to the measure used in a majority of the literature on hopelessness, the Beck Hopelessness Scale (BHS) (Beck, Weissman, Lester, & Trexler, 1974). Although both are the most frequently used measure for their respective variables in research, (Kliem, Lohmann, Mößle, & Brähler 2018 and Scheier, Carver, & Bridges 1994) and have been shown to have high correlation to each other (Steed 2001), there are some differences. This includes that the BHS has a slightly higher Cronbach's alpha, at .88 versus the LOT-R's .78 (Steed 2001). Although a small difference, it becomes more important when considering that the LOT-R is only 10 items of which 4 are filler items, this is compared with BHS 20 items. This means that there is a higher internal consistency across more items for the BHS compared with the LOT-R. This could mean that the BHS is more accurate at measuring hopelessness than the LOT-R is at measuring optimism. This could account for the stronger prediction of suicidal ideation from hopelessness, than optimism as found in the current study.

Secondly, the difference in strength of prediction may be due to the nature of the variables itself. If we consider hopelessness, it is a defined symptom of depression, therefore its presence indicates psychopathology, which suicidal ideation is also deemed to be (American Psychiatric Association, 2013), however the absence of optimism does not indicate illness nor is its presence a prerequisite for wellness. Therefore, the stronger predictive power of hopelessness could be due to both

The relationships between problem-solving, optimism and suicidal ideation hopelessness and suicidal ideation's association with illness. Whereas optimism seems to be protective against suicidal ideation but is not as directly associated with psychopathology. This is reflected by Steed (2001) who investigated the reliability and validity of both BHS and LOT-R, concluding that both are reliable but that the LOT-R is a more valid measure for non-clinical samples. Which this study could be classified as but as data collection was online and anonymous, it is impossible to know if a participant had a mental health diagnosis which may have affected the predictive strength of optimism.

To conclude, this study found evidence that optimism mediates the relationship between problem-solving and suicidal ideation. However, the literature suggests that this is not a simple relationship, with other factors both influencing and being influenced by optimism and problem-solving. This shows that many factors need to be considered in relation to suicide prevention.

Yet the current study adds to the literature in a number of ways, first, by adding to the evidence that problem-solving and optimism are related and are important factors to consider when assessing suicide risk. In addition, currently most literature focuses on the effect of hopelessness on suicide and risk factors, this study's focus on optimism and the relationship with suicide risk factors adds to the evidence of positive psychology based research and therefore intervention.

7.2 Limitations of current study

This study has several limitations. Firstly, data was gathered through self-report measures. It is well documented that self-report measures can be influenced by social desirability, particularly when what is being measured conflicts with social norms (Gittelam et al. 2015). In this study people may have wanted to see themselves as better problem-solvers and more optimistic people than they really are. In addition, this study asked the participants questions of a sensitive nature concerning their thoughts and intentions around suicide. This could have been influenced by the stigma that surrounds issues of mental illness and suicidality. It is

The relationships between problem-solving, optimism and suicidal ideation known that suicidal ideation and intentions are under reported (Binnix, Rambo, Abrutyn & Mueller 2018).

However, some researchers have claimed that this effect is overstated and that this only accounts for a small percentage of variance (Caputo 2017). As well as this, the measures were completed online and were completely anonymous. This negated any social desirability caused by there being a researcher present who may have been seen as an authority figure. However, there was no way to control how the measures were completed. Thus, meaning the questionnaires could have been completed in groups and/or in public, which may have influenced answers.

Another issue with self-report measures is raised when considering the variable problem-solving. The problem-solving measure asked participants to appraise their own problem-solving ability. This appraisal may be influenced by a number of factors, meaning that the appraisal does not reflect true ability. In a study carried out with real-life problem-solving tasks, as well as self-report measures, with depression individuals and a control group, no significant differences were found between the groups with the self-report measures. However, the depressed group showed deficits and less effective strategies in the real-life problem-solving tasks (Anderson, Goddard, & Powell 2007). This suggests that different levels of problem-solving may have been found if this study had used real-life problem-solving tasks, indeed it was noted earlier that the mean score of problem-solving appeared high. However real-life problem-solving tasks would have destroyed anonymity and may have encouraged social desirability, with the presence of a researcher.

The way the data were collected also limits the ability to generalise the findings in the current study. This is because data were gathered using an opportunity sample, rather than a clinical or student population as used in most of the literature mentioned so far. This may have particularly affected ratings of suicidal ideation, as a clinical population may display higher levels of suicidal ideation. As noted previously, high levels of suicidal ideation were not found in the current study. It is known that those who have a mental illness diagnosis are more likely to report

The relationships between problem-solving, optimism and suicidal ideation and this has been shown across multiple countries (Nock et al. 2008). In addition, it has been shown that around 80% of those who complete suicide have had contact with a healthcare professional within the year before death (Ahmedani et al. 2014). This implies that a clinical population would have had high ratings of suicidal ideation which may have impacted the relationships between the variables of optimism, problem-solving and suicidal ideation which were found in the current study. However, Bebbington et al. (2010) claimed that it is important to look at suicidality in the general population to better understand the scale of the issue. An opportunity sample may better reflect the general population and therefore be better able to identify universal relationships between suicide and its risk factors.

Other influences that may have affected the participants data is their ethnicity. The majority of participants in the current study reported their ethnicity as either white British or white other. The literature on risk factors affecting suicidality, as previously mentioned, has shown several differences between ethnicities. For example, Yu and Chang (2016) found that ratings of optimism predicted suicidal ideation in Caucasian, Black and Latino but not with Asian students. Furthermore, other ethnic differences have been found with suicidal behaviour. For example, it has been theorised that there is underreporting of suicidal ideation and behaviour in Black African populations (Stansfeld 2012). This could mean that those who identified as Black in this study have misreported their suicidal intent, which may have influenced the results. Alternatively, the small number of black participants in the current study may reflect this community's reluctance to report suicidal ideation (Anderson, Lowry & Wuensch 2015). This under representation in this study may mean the relationship found between problem-solving, optimism and suicidal ideation is not representative of this group, meaning their risk factors are not being understood. Previous studies have identified that there are different risk factors for different ethnic groups, with risk factors for white participants being more readily identified (Polanco-Roman, Tsypes, Soffer & Miranda 2014).

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Another limitation with the participants of the current study is the gender split with approximately 50% more females than males. This does not reflect the gender split in the rate of suicide, with around three quarters of suicides in the UK being male (Office of Nation Statistics 2017). There have also been differences shown in the method and intent of a suicide attempt, with it being theorised that males have more intent to die, whereas for females it is a desire to communicate distress (Freeman et al 2017). This implies differences in the pathway to suicidal behaviour between genders, which may affect the relationship between characteristics such as problem-solving and optimism and suicidality. In the current study, when data was split by gender, differences in correlations were found with the male data, as shown in table 3. It was found that when only male participants data was analysed there was no correlation between problem-solving and suicidal ideation or between problem-solving and optimism, although this was close to significance with $p = 0.055$. This implies genuine gender differences were found in the current study.

In addition to this, two participants did not specify their gender, it may be that this reflected participants who did not identify as either male or female. It is known that there are higher rates of suicidality in the trans gendered and non-binary community and that the pathway from ideation to action may be different to those who identify as cis-gendered (Wolford-Clevenger, Frantell, Smith, Flores & Stuart 2018).

Lastly, the design of the study itself has the limitation of its design, in that it is a correlational, cross sectional study. Firstly, correlation does not show causation, this is because other variables that are not measurable, or observable, may be influencing the relationship(s) analysed. However, it is worth noting that correlation can rule out a causal connection, as there is always a correlation when there is causal connection but not vice-versa (Asamoah 2014). Therefore, this study cannot claim that increases in problem-solving cause changes in optimism or suicidal ideation, but it does not rule it out. This means that the direction of the relationship between for the variable cannot be established, therefore it could be that suicidal ideation inhibits optimism which in turn inhibits problem-solving. This

The relationships between problem-solving, optimism and suicidal ideation was shown in the analysis as the relationship shown in Figure 6 was also significant:

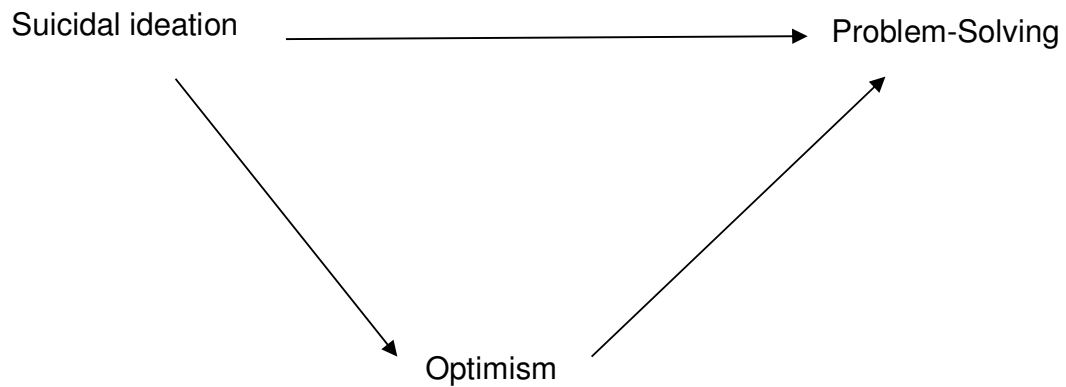


Figure 6. Relationship between variables also found to be significant in analysis of the data.

The relationship shown in Figure 6. may imply that when an individual becomes suicidal it suppresses optimism and in turn negatively affects problem-solving ability. This would suggest that problem-solving and optimism interventions would not be effective as suicidal ideation influences them, rather than vice versa.

Secondly, a cross-sectional study only captures a snapshot of time. This means that data, and therefore results, may have been different if collected at a different time (Levin 2006). Furthermore, the current study is prone to the Neyman bias, this is that those who have died from suicide, by its very nature, are excluded from the current study (Hill, Connelly, Hébert, Lindsay & Millar 2003). Therefore, the levels and relationship between optimism and problem-solving and those who complete suicide may be different and are not observable.

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7.3 Implications for practice and future research

The above-mentioned limitations do not preclude the current study from having a number of implications for practice, as well for future research. These will now be discussed.

Firstly, the relationship found in the current study suggests that problem-solving is only negatively correlated to suicidal ideation through its relationship to optimism, which in turn is negatively correlated to suicidal ideation. Although causation cannot be determined, a theorised direction of causation could be that better problem-solving ability leads one to be more optimistic, which could protect them from suicidality. This would have implications for suicide prevention and improving clients' wellbeing, in that it may be appropriate to use interventions aimed at increasing an individual's optimism in acute crisis situations, due to its direct relationship with suicidal ideation. Whereas interventions to increase problem-solving skills may be a longer-term target due to the time taken for skills acquisition, as well as its indirect effect on suicidal ideation through optimism. This is similar to the implications theorised by Dixon, et al. (1994) who found a similar pattern of relationship as found in the current study, but with the variable of hopelessness, rather than optimism.

There is evidence to suggest that optimism can be increased, as explored in the earlier literature, Seligman's learned optimism shows promising results. In addition, it has been shown that the level of hope can be increased through a single-session based intervention (Feldman and Dreher 2012). If interventions aimed at increasing optimism became more routine with acutely suicidal patients it could become a powerful tool for clinicians who can often be unsure how to lower risk quickly. This would lower the anxiety of clinicians and more importantly prevent people from going on to complete suicide.

Furthermore, a number of studies have found that problem-solving therapy can indeed increase people's problem-solving ability. For example, a cognitive behaviour based problem-solving therapy with adolescents showed a dramatic reduction in both suicide risk and depression symptomology a year post-treatment

The relationships between problem-solving, optimism and suicidal ideation versus a waiting list condition. In addition, improvements were seen in patients' self-esteem and assertiveness (Eskin, Ertekin & Demir 2008). Other studies, using similar interventions, have found increases in problem-solving ability with other populations, such as adults with personality disorder (McCarthy, Mergenthaler & Grenyer 2014), and those with vision impairment (Holloway et al 2018). This shows long-term benefits from increasing an individuals' problem-solving ability in terms of aspects of wellbeing. Furthermore, this intervention could be used proactively to limit the chance that an individual may become suicidal, if a deficit in problem-solving ability is identified.

The fact that there is promising evidence that both optimism and problem-solving skills can be improved through therapeutic intervention, has implications for trauma work. It is known that those who experience trauma have an increase in suicidal ideation and behaviour (Pompili 2012) but it also been shown that both problem-solving skills and optimism can be protective factors for trauma related symptoms (Sutherland & Bryant 2008, Mažulytė et al. 2016). Therefore, it would be important for practitioners who are working with individuals who have experienced trauma to consider deficits in optimism and problem-solving and incorporate interventions accordingly to prevent a suicidal episode and promote recovery.

The potential for long-term interventions and the proactive nature of problem-solving therapy, also raises other implications. For example, problem-solving ability may be a developmental factor to consider in such settings as education and parenting. It has been shown that encouraging a child's curiosity impacts the development of their problem-solving ability (Hardy, Ness & Mecca 2017). Therefore, this could be a longer-term suicide prevention strategy that starts early and brings other benefits that come with improved problem-solving ability, such as better academic achievement (Kanmani & Nagarathinam 2017), lower levels of aggressive behaviour (Abdulmalik, Ani, Ajuwon & Omigbodun 2016), and protection from negative effects of exposure to violence (LeBlanc et al. 2011).

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Furthermore as it has been shown that the development of optimism and problem-solving ability are influenced by attachment style (Renaud, Barker Hendricks, Putnick & Bornstein 2019, Arslan, Arslan & Ari 2012), supporting parents to ensure conditions are conducive for their children to form secure attachments is therefore also long-term suicide prevention. It may be that those at higher risk of being able to model the conditions needed for secure attachment, such as those with a history of aggression (Martin et al. 2012) or a mental health diagnosis (Greig and Howe 2001) would benefit from parenting skills support which in turn would protect their offspring from suicidal behaviour in the future. There is some evidence that early interventions can impact maternal mental health and parent-infant interactions (Brahm et al. 2016).

The ability to use interventions to build an individual's skills is a way to help people reach their potential and provides a more positive way to approach a person in distress. This positive approach would move the narrative away from one of illness and problems, which can leave the individual feeling at fault, and/or stuck in a diagnosis. This aligns with the counselling psychology approach that distances itself from the ideology of abnormality and disorder, in order to reframe distress to empower individuals to believe change and growth are possible (Davies 2018).

The findings of the current research and other literature also suggest that monitoring the problem-solving ability and optimism levels of those who present to mental health services could help improve suicide prevention. This monitoring may identify people at risk of suicide who may not initially present with current suicidality, or those who do not show traditionally assessed risk factors, such as age, gender and absence of protective factors. This is important, as many individuals have had recent contact with health services before completing suicide (Ahmedani et al. 2014), this implies that some were not identified as high risk. By having additional tools to identify risk, more people will be highlighted, and further support can be provided.

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These interventions stem from a positive psychology philosophy, which, like counselling psychology, has its roots in humanistic principles which aim to encourage growth and facilitate change (Steffen, Vossler & Joseph 2015). The desire to improve wellbeing and see an individual grow is key to the aims of both counselling and positive psychologists alike. This would also help a counselling psychologist be true to their identity as a counselling psychologist, staying with the individual, rather than relying on an impersonal check box activity, which feels safe due to the anxiety that management of a suicidal person can cause.

Another important aspect of counselling psychology is the ability to work integratively and in different therapeutic models (British Psychological Society, Division of Counselling Psychology 2005). Therefore, the findings of the current study should be seen as being able to inform practice across therapeutic models. For example, the psychodynamic model sees the suicidal state as fundamentally a solution to the problems of despair and internalise conflicts (Campbell and Hale 2017). While the existential model sees the suicidal state arising from the inability to find new meaning from one's current life situation (Lockman Servaty-Seib 2018). Both approaches frame the suicidal state as arising from a problem that seems to be insurmountable with little hope for the future, therefore considering problem-solving ability and levels of optimism in the therapeutic work may allow solutions, other than suicide, to be considered, to address the above problems and instil hope. It is important for practitioners to incorporate research findings from outside their main working framework to inform their practice (British Psychological Society 2017).

These implications for practice and the findings of the current study suggest the need for future research. This includes carrying out research that addresses some of the limitations of the current study, such as a longer-term study that collects data on individuals problem-solving, optimism, and suicidal ideation. This would establish if the relationships found in the current research are stable and enduring, or if there are changes over time. This could add evidence to the theory that it is problem-solving that has an influence on optimism and in turn suicidal ideation, rather than suicidal ideation influencing the other variables. This would be if

The relationships between problem-solving, optimism and suicidal ideation changes in suicidal ideation that occurred over the timespan in the proposed longitudinal study, were shown not to affect problem-solving ability or optimism levels. Alternatively, if those with a low problem-solving or optimism levels were shown to have a higher probability of entering at least one suicidal crisis across the timespan covered by the proposed study, this would also add evidence to the direction of causality being problem-solving influencing optimism which then influences suicidal ideation.

The possible causal relationships between the variables of problem-solving, optimism and suicidal ideation, explored in the current study could be explored further through a qualitative methodology. The current study found a general pattern in the variables, but the experience of this at an individual level ie, how the impact of problem-solving and optimism is understood by the suicidal individual is not established. Therefore, an interpretative phenomenological analysis could be carried out with individuals post suicidal crisis to explore their understanding of problem-solving and optimism. This could establish a possible direction of the relationship between the variables of problem-solving, optimism and suicidal ideation, as perceived by the individual. This would be in line with the Counselling Psychology approach of understanding how an individual makes sense of their context (Woolfe, et al. 2003).

As suggested above, problem-solving therapy should be a longer-term intervention when an individual is not in acute crisis and interventions aimed at increasing optimism for those who are in crisis. Although there is literature to support the efficacy of problem-solving therapy, as discussed above, there is dearth of evidence for optimism crisis interventions, despite the mounting evidence of its relationship with suicidality. There is evidence for Seligman's learned optimism, but this is not designed as a crisis intervention and has not been tested as such. Furthermore, the research mentioned above that showed an increase in optimism after one session, was carried out on university students (Feldman & Dreher 2012), Therefore, it is unclear if the intervention would produce the same results with

The relationships between problem-solving, optimism and suicidal ideation individuals who had made an expression of suicide ideation and/or intent in a mental health care setting.

Lastly, a randomised controlled trial (RCT) could be carried out in a crisis setting where individuals deemed at risk are assigned to either treatment as usual, or with the addition of the single session of optimism increasing intervention. The ratings of suicidal ideation pre and post intervention, reoccurrence of suicidal episode, and the number of suicides could be collected by researchers who do not know what treatment an individual received. An RCT is the gold standard used by NICE guidelines to measure a treatment's efficacy and whether to recommend its use in the NHS (NICE 2014). Therefore, if the results of the proposed RCTs showed positive outcomes it would increase the likeliness that the intervention would be recommend as a treatment for suicidal individuals.

7.4 Final Reflexivity

The outcome of the research has confirmed my critical realist stance. The results and conclusions of the study, although adding to literature on suicidality and I hope prevention, are a just a small snapshot of what is a complex and challenging issue. This complexity is shown by the literature that reveals other factors that both influence and are influenced by problem-solving and optimism. This cements the idea that patterns and relationships can be found but often the true picture is more complex than what can be observed (McDonnell et al. 2009). For me, this has been a reminder that although problem-solving and optimism are promising interventions points in suicide prevention, they should not be the sole focus of any interventions and to do so would risk losing the individual's meaning and context. This would also be to lose the fundamentals of counselling psychology that aims for individual care and understanding (Simms 2017), which is the main reason that I was attracted to counselling psychology in the first place.

I believe that this desire to help in an individualised way has also influenced how I have carried out the research. This is stated in my original reflective statement as the reason I chose a positive psychology focus and philosophy which believes in

The relationships between problem-solving, optimism and suicidal ideation the strengthening of skills in an individual to improve wellbeing. Yet, this belief in individualised care to improve wellbeing has influenced how I have carried out my research. For example, by comparing other literature to my findings, I hope to contribute to a better understanding of how to approach suicide prevention, rather than seeing other literature as a contradiction, and therefore invalidation, of what I have found. This comes from a desire for better suicide prevention that saves more lives, to ease my sense of helplessness from my own experience and in hope of being a more effective practitioner with my own clients.

Just as I have affected my research, my research has affected me. The process has been filled with anxiety, relief and pride. An unexpected source of anxiety occurred when it came to data collection. I had the questionnaire ready for at least a week before I shared it online. I feared others' reaction to the research topic as well as the variables I had chosen to investigate. I wondered if people would think I was foolish to take a positive approach to such a devastating issue and that by doing this I implied an ignorance of the issue of suicide and others' experience of it.

However, what occurred was the opposite, people were supportive of my efforts and open to participating and sharing, resulting in recruiting more participants than I needed and quicker than the timescales I had established for data collection. This contrast, in what I thought would happen and the reality of what actually occurred, made me reflect on why I had assumed such a negative reaction. I was fortunate to be in personal therapy at the time and, with my therapist's help, was able to realise that my automatic assumption in most circumstances is that I will not be good enough. On reflection this has also been at play in my research supervision meetings where I have been nervous before each one, believing that this would be the time I would be 'found out' and told that I was not capable of completing the research to the level required. This could be due to a therapist schema of helplessness (Leahy 2001), which means that I often fear I am not competent or worry I do not know what to do with my clients despite positive feedback from tutors, supervisors and clients.

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This has made me reflect on how this may influence my practice and future career. Although my assumption could have a beneficial effect, in that it will hopefully drive me to learn more and not to become complacent in my knowledge and practice. I will, however, also need to ensure that this does not limit my practice and prevent me trusting my skills and experience, which may negatively impact my client work and therefore cause the assumption of not being good enough to become a self-fulfilling prophecy. I do believe that the process of conducting the research and the last year of training has helped me mature more in my identity as a counselling psychologist. This has at times led me to allow myself to be proud of what I have achieved, as well as improving my ability at catching myself when I fall in to my assumption of not being good enough.

Finally, the response to the questionnaire reminded me how commonplace, sadly, suicide is, as many shared that they had lost a loved one through suicide. This reinforced my belief in the importance of suicide prevention and the need to help those at risk. This is another reason why I need to not let my assumptions limit my goals as well as my client work, as risk taking and confidence is needed when working with high risk clients.

Ultimately, my research has helped highlight issues that I need to continue to work on, but also cemented the hope I have that suicide can be prevented with an individualised approach to care, with evidence-based interventions.

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Appendix A: Brief

I am a trainee counselling psychologist at London Metropolitan University and am currently carrying out research to investigate how the relationship between suicidal thoughts and optimism is affected by problem-solving skills.

Very little is known about how suicidal ideation, optimism and problem-solving interact, but it is known that problem-solving and optimism are highly related as well as optimism with suicidal ideation. The lack of research on these factors suggests that suicide prevention has focused on identifying and minimising risk issues, rather than helping with an aspect of a person that may make them susceptible to suicide. My hope is that by carrying out this research, we will be able to gain a better understanding of the factors that affect suicidal ideation. With greater understanding we can potentially create more effective interventions to better protect people from suicide.

I am writing in the hope that you will be interested in helping me in this endeavour and complete questionnaires that rate levels of suicidal ideation, problem-solving and optimism. The questionnaire will ask questions in which you are asked to honestly rate aspects of your thinking and personality on a scale. Data from your answers will be used for my Doctoral counselling psychology project.

Participation is entirely voluntary. If you choose to participate you are free to withdraw at any point before the submission of your answers. All data will be entered anonymously and therefore cannot be withdrawn once answers are submitted.

Before you decide to participate it is important that you understand that the questionnaire concerning suicidal ideation may evoke some distressing and difficult feelings for you.

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Therefore, please take your time in deciding whether or not you wish to take part. Once you have completed the questionnaires, you will be given information on sources of support.

By submitting your answers, you give your consent for your data to be used in the study. If you understand what is being asked and you are happy to proceed, you can do so. However, if you have any questions please contact me before taking part.

Thank you so much for your time, if you have any further queries please do not hesitate to ask email: amm0843@my.londonmet.ac.uk

Thank you for your participation and your time.

Yours Sincerely,

Amy Morris

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Appendix B: Debriefing Form

Thank you for taking part in this research study which forms part of a Doctoral project that the researcher is conducting.

If you are interested in the results of the study, or if you have any questions about this study, please contact the researcher on the following email address:

amm0843@my.londonmet.ac.uk

Emails will be checked regularly.

If you have any complaints regarding any aspect of the way you have been treated during the course of the study please contact my research supervisor Dr Angela Loulopoulou on Email: a.loulopoulou@londonmet.ac.uk

If participation has raised any concerns or issues that you wish to discuss further, a number of agencies can provide advice and support in confidence.

- Mind- Web: www.mind.org.uk

Phone: 0300 123 3393

Emailinfo@mind.org.uk

Text: 86463

- CALM – Web: www.thecalmzone.net

Phone: 0800 58 58 58

- Samaritans - Web: www.samaritans.org

Phone: 08457 90 90 90* (UK)/[116 123 \(ROI\)](tel:+353116123)

Text: 07725 909090

- Your GP - <http://www.nhs.uk/Service-Search/GP/LocationSearch/4>

- In an emergency, always call 999 or attend your local A & E department.

Please remember that suicidal feelings are temporary and can be overcome.

Suicide is not an inevitability.

Recovery is possible with the right support and help.

Do not suffer in silence.

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Appendix C: Life orientation Test- Revised (LOT-R)

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

1 = I agree a lot

2 = I agree a little

3 = I neither agree nor disagree

4 = I disagree a little

5 = I disagree a lot

1. In uncertain times, I usually expect the best.
2. It's easy for me to relax.
3. If something can go wrong for me, it will.
4. I'm always optimistic about my future.
5. I enjoy my friends a lot.
6. It's important for me to keep busy.
7. I hardly ever expect things to go my way.
8. I don't get upset too easily.
9. I rarely count on good things happening to me.
10. Overall, I expect more good things to happen to me than bad.

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Appendix D: Problem Solving Inventory-Problem Solving Self-Efficacy and Problem Solving skills scales (PSI-PSSE-PSS)

1 = I agree a lot

2 = I agree a little

3 = I neither agree nor disagree

4 = I disagree a little

5 = I disagree a lot

1. When my first efforts to solve a problem fail, I become uneasy about my ability to handle the situation.
2. I have the ability to solve most problems even though initially no solution is immediately apparent.
3. Many of the problems I face are too complex for me to solve.
4. When I make plans to solve a problem, I am almost certain that I can make them work.
5. Given enough time and effort, I believe I can solve most problems that confront me.
6. When faced with a novel situation, I have confidence that I can handle problems that may arise.
7. I trust my ability to solve new and difficult problems.
8. When a solution to a problem has failed, I do not examine why it didn't work.
9. After following a course of action to solve a problem, I compare the actual outcome with the one I had anticipated.
10. When I have a problem, I think of as many possible ways to handle it as I can until I can't come up with any more ideas.
11. When considering solutions to a problem, I do not take the time to assess the potential success of each alternative.
12. When confronted with a problem, I stop and think about it before deciding on a next step.
13. When making a decision, I compare alternatives and weigh the consequences of one against the other.
14. I try to predict the result of a particular course of action.

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15. When thinking of ways to handle a problem, I seldom combine ideas from various alternatives to arrive at a workable solution.

16. When confronted with a problem, I usually first survey the situation to determine the relevant information.

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Appendix E: Scale for Suicidal Ideation (SSI)

How would you rate:

1. Your wish to live:

1. Moderate to strong
2. Weak
3. None

2. Your wish to die

1. None
2. Weak
3. Moderate to strong

3. Your reasons for living/dying

1. For living outweigh for dying
2. About equal
3. For dying outweigh for living

4. Your desire to make active suicide attempt

1. None
2. Weak
3. Moderate to strong

5. Passive suicidal desire

1. Would take precautions to save life
2. Would leave life/death to chance
3. Would avoid steps necessary to save or maintain life

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6. Duration of suicide ideation/wish

1. Brief, fleeting periods
2. Longer periods
3. Continuous (chronic) or almost continuous

7. Frequency of suicide ideation/wish

1. Rare, occasional
2. Intermittent
3. Persistent or continuous

8. Attitude toward ideation/wish

1. Rejecting
2. Ambivalent; indifferent
3. Accepting

9. Control over suicidal action/acting-out wish

1. Has sense of control
2. Unsure of control
3. Has no sense of control

10. Deterrents to active attempt (e.g., family, religion, irreversibility)

1. Would not attempt because of a deterrent
2. Some concern about deterrents
3. Minimal or no concern about deterrents

11. Reason for contemplated attempt

0. Not considered
1. To manipulate the environment; get attention, revenge
2. Combination of 1 and 3
3. Escape, surcease, solve problems

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12. Method: Specificity/planning of contemplated attempt

1. Not considered
2. Considered, but details not worked out
3. Details worked out/well formulated

13. Method: Availability/opportunity for contemplated attempt

0. Method not available; no opportunity
1. Method would take time/effort; opportunity not readily available
2. Method and opportunity available
3. Future opportunity or availability of method anticipated

14. Sense of "capability" to carry out attempt

0. Not Considered
1. No courage, too weak, afraid, incompetent
2. Unsure of courage, competence
3. Sure of competence, courage

15. Expectancy/anticipation of actual attempt

1. No
2. Uncertain, not sure
3. Yes

16. Actual preparation for contemplated attempt

1. None
2. Partial (e.g., starting to collect pills)
3. Complete (e.g., had pills, loaded gun)

17. Suicide note

1. None
2. Started but not completed; only thought about
3. Completed

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18. Final acts in anticipation of death (e.g., insurance, will)

1. None
2. Thought about or made some arrangements
3. Made definite plans or completed arrangements

19. Deception/concealment of contemplated suicide

1. Revealed ideas openly
2. Held back on revealing
3. Attempted to deceive, conceal, lie

Appendix F: Ethical approval



London Metropolitan University
School of Social Sciences
Research Ethics Review Panel

I can confirm that the following project has received ethical approval by one anonymous reviewer and the Head of School of Social Sciences Ms. J. Skinner to proceed with the following research project:

Title: A Hope that Suicide is not the Solution: A Mediation Analysis of the Relationship Between Suicidal Ideation, Optimism and Problem Solving

Student: AMY MORRIS

Supervisor: Dr PARVEEN BHATARAH

Ethical clearance to proceed has been granted providing that the study follows the ethical guidelines used by the School of Psychology and British Psychological Society, and incorporates any relevant changes required by the Research Ethics Review Panel. All participating organisations should provide formal consent allowing the student to collect data from their staff.

The researcher is also responsible for conducting the research in an ethically acceptable way, and should inform the ethics panel if there are any substantive changes to the project that could affect its ethical dimensions, and re-submit the proposal if it is deemed necessary.

Signed:  Date: 7 June 2017
Dr Angela Ioanna Loulopoulou
(Chair - Psychology Research Ethics Review Panel)

Email a.loulopoulou@londonmet.ac.uk

