

THE INVENTORY OF MOTIVATIONS FOR SUICIDE ATTEMPTS (IMSA): DEVELOPING
AND VALIDATING A NEW MEASURE IN FIVE SAMPLES

by

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Abstract

Suicide is a leading cause of death worldwide. Despite increased research and prevention efforts, suicide attempt and death rates have not declined. One way to improve suicide prevention is to better understand the motivations for suicide attempts. The field lacks a psychometrically sound, comprehensive measure to routinely why individuals try to end their lives. The Inventory of Motivations for Suicide Attempts (IMSA) was developed to assess motivations for suicide emphasized by major theories of suicidality. The IMSA was administered to five samples of individuals who had attempted suicide: undergraduates (N=66), outpatients (N=53), adult inpatients (N=59), adolescents (N=50), and a community sample recruited online (N=222). Demographic data and characteristics of the suicide attempt (e.g., method, intent, lethality, pre-attempt communication) were also collected. In all five samples, psychache and hopelessness were the most common and strongly endorsed motivations, while interpersonal influence was the least endorsed. Regardless of sample, the individual IMSA scales demonstrated good internal reliability, as did two superordinate IMSA factors identified through exploratory factor analysis. The two superordinate factors captured Internal Motivations (characterized by needing to escape or relieve unmanageable internal emotions and thoughts) and Communication Motivations (characterized by a desire to communicate with or influence another individual) in all samples. These two factors demonstrated good convergent and divergent validity when compared to another measure of suicide motivations. In addition, the IMSA scales displayed clinical utility, in which greater endorsement of Internal Motivations was associated with stronger desire to die, whereas greater endorsement of Communication Motivations was associated with weaker suicide intent and greater likelihood of rescue. Findings support two conclusions: 1) the IMSA provides reliable and valid information about a number of

motivations for attempted suicide across diverse participants and situations and 2) that those motivations, their structure, and their clinical correlates are quite consistent. The IMSA can be of use for both research and clinical purposes when a comprehensive assessment of suicide motivations is desired.

Preface

I am the primary contributor and author of the work presented in this dissertation. I was generally responsible for all study design, data collection, data analysis, and manuscript writing and preparation. Additional contributions and any exceptions are listed below.

A version of Chapter 2 is published: May, A.M. & Klonsky, E.D. (2013). Assessing motivations for suicide attempts: Development and psychometric properties of the Inventory of Motivations for Suicide Attempts (IMSA). *Suicide and Life-Threatening Behavior*, 43, 532-546. I developed the research question, collected the data, ran the analyses, and wrote the first draft of the manuscript. Dr. Klonsky assisted with study design, provided intellectual contributions, and edited subsequent drafts of the manuscript.

For the studies presented in Chapter 3, Chapter 4, and Chapter 6, I developed the projects, collected the data, conducted the analyses, and wrote the manuscripts. Dr. Klonsky assisted with study design and provided intellectual contributions and consultation.

A version of Chapter 5 is currently in press: May, A.M., O'Brien, K.M., Liu, R.T., & Klonsky, E.D. (in press). Descriptive and psychometric properties of the Inventory of Motivations for Suicide Attempts (IMSA) in an inpatient adolescent sample. *Archives of Suicide Research*. The idea for this project was developed in collaboration with Dr. Kim O'Brien. Dr. Anthony Spirito and Dr. Kim O'Brien headed the larger project from which the data were obtained. Dr. Richard Liu assisted in structuring the data and revising the manuscript. I conducted the data analysis and wrote most sections of the first draft of the manuscript. Dr. O'Brien and Dr. Liu contributed to

writing and revising portions of the manuscript. Dr. Klonsky contributed to revising drafts of the manuscript.

Portions of Chapter 7 are drawn from the Discussion sections of May & Klonsky (2013) and May, O'Brien, Liu, & Klonsky (in press). See above for further details.

The research described in this dissertation was approved by the UBC Behavioral Research Ethics Board, the Vancouver Coastal Health Authority, the Lifespan – Rhode Island Hospital Institutional Review Board, and Bradley Hospital Institutional Review Board under certificate numbers: FWA-00001230, 00003538, 0000396, 00004624, H10-01543, H12-00726, H13-01049, H13-03420, and V12-00726.

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1 Introduction

1.1 Overview

Suicide is the 9th leading cause of death in Canada and the 10th leading cause of death in the United States, killing over 3,700 Canadians and 41,000 Americans each year (Centers for Disease Control, 2015a; Statistics Canada, 2014). This is approximately the same number of people who die in motor vehicle accidents each year and over twice the number of people who die by homicide in the US and over seven times the number of people who die by homicide in Canada (CDC, 2015a; Statistics Canada, 2014). In addition to the loss of life and potential of the individual who dies, suicide death causes extensive suffering for the friends and family of the deceased.

For every suicide death, approximately 12 individuals visit the emergency department for non-lethal self injury¹ (AFSP, 2015). In addition, many more people make suicide attempts for which they do not require or receive medical attention, suggesting the attempt to death ratio is even higher. Non-lethal suicide attempts can result in restriction of liberties, hospitalization, disrupted relationships, physical pain, permanent injury, and great amounts of shame. Given all these negatives outcomes, finding more effective ways to prevent suicide attempts is essential. However, suicide attempt and death rates have remained relatively constant over the last fifty years, despite increased prevention efforts (CDC, 2013; WHO, 2011).

One way to improve suicide prevention is to better understand the motivations for suicide attempts. Understanding the function a suicide attempt serves allows the clinician and the attempter to find other solutions that may solve the same problem. Better understanding suicide

¹ Intent is not reported, so this statistics combines suicide attempts and episodes of nonsuicidal self injury.

motivations overall can also contribute to improved prevention and intervention campaigns that target the most common motivations in a particular population.

A suicide attempt is defined as “self-inflicted, potentially injurious behavior with a nonfatal outcome for which there is evidence of intent to die” (Silverman, Berman, Sanddal, O’Carroll, & Joiner, 2007). Thus, most people assume that the purpose of a suicide attempt is to die, since that function is key to the definition of the behavior. As the literature review below will demonstrate, this is indeed one of the most commonly endorsed reasons for attempting suicide. However, research suggests that suicide attempts may serve many *additional* functions as well, including escape, communication, altering the environment, and dealing with an impossible state of mind (Brown, Comtois, & Linehan, 2002; Chapman & Dixon-Gordon, 2007; Holden, Kerr, Mendonca, & Velamoor, 1998; Schnyder, Valach, Bischsel, & Michel, 1999).

Furthermore, longstanding theoretical models of suicidality suggest a variety of motivations for suicide attempts. For example, Roy Baumeister (1990) drew on social, personality, and cognitive psychology to posit that suicide attempts were motivated by a need to escape from an especially painful state of self awareness. Edwin Shneidman (1993) theorized that suicide was caused by a desire to end intolerable emotional or psychological pain, what he termed “psychache.” More recently, Thomas Joiner (2005) presented the interpersonal theory of suicide, which states that three domains must be present for a suicide to occur. Perceived burdensomeness and thwarted belongingness, the first two domains, confer the desire for suicide (e.g. suicidal ideation). The third domain, acquired capability, is believed to be necessary in order for an individual to undertake potentially lethal self-harm.

In both clinical and research contexts a psychometrically sound measure of motivations for suicide attempts originating from the major theories of suicidality would be beneficial. By

better understanding the motivations that precipitate a suicide attempt mental health providers could more accurately tailor interventions to address the problems that led to the attempt. Research endeavors would benefit from a measure of attempt motivations, as it would allow systematic testing of the various theories of suicidality through empirical data. Additionally, more nuanced and detailed information about motivations for attempts will help classify specific types of suicide attempts. Different attempts may have varying relationships to planning, lethality, and risk for future suicidal behavior. Rather than grouping all attempts together as a single behaviorally defined event, investigating a typology for suicide attempts may be a beneficial way of further understanding them.

The dissertation is organized as follows. First, the empirical literature on reasons for suicide attempts and existing measures will be reviewed (Chapter 1). Next, the major theoretical models of suicidality will be presented (Chapter 1). Then an overview of the plan for the dissertation project will be described (Chapter 1). Next, the methods and results for each of the four studies will be presented (Chapters 2 through 5). Following that, further analyses comparing results between and across the studies will be explored (Chapter 6). Finally, the implications of the findings and proposed directions for future research will be discussed (Chapter 7).

1.2 Review of the Empirical Literature on Reasons for Attempting Suicide

Sixteen papers that empirically assess the motivations for suicide attempts were identified, thirteen of which are based on versions of and precursors to the Reasons for Attempting Suicide Questionnaire (RASQ; Johns & Holden, 1997; Holden et al., 1998). The RASQ is a 14-item measure that evaluates the reasons for an attempt. It was developed as follows. Nine suicide attempt motivations were generated by researchers and presented to a sample of 128 patients who injured themselves by self-poisoning in the early 1970's (suicidal intent was present in two

thirds of the cases) (Bancroft, Skrimshire, & Simkin, 1976). A further sample of 41 participants was asked both to select from the predetermined reasons and to offer their own spontaneous responses (Bancroft et al., 1979). The self-generated reasons greatly differed from the listed ones, resulting in five additional motivations. Twenty years later, Ronald Holden and collaborators used these 14 items to make the RASQ (Holden et al., 1998). The RASQ begins with the instruction “Please rate how much each of the following reasons was a reason for your suicide attempt” and then lists statements such as “Punish myself,” “Show how much I love someone,” and “To get relief from a terrible state of mind.”

The RASQ is a useful starting place as it captures some plausible reasons for suicide attempts. However it is incomplete, as its items come from a relatively small sample of suicide attempters mixed with non-suicidal self-injurers who engaged in a single method of self-harm. Furthermore, the items do not reflect specific theories of suicidality. Notably, at least two of the most influential theories of suicidality, Baumeister’s escape theory and Joiner’s interpersonal theory were not cohesively presented until many years after the development of Bancroft’s items in the 1970’s.

The literature on the RASQ will be reviewed to highlight key findings, as well as describe important limitations to be addressed in future work. The original RASQ study of 173 ideators and attempters found a two-factor solution using principal component analysis (Holden et al., 1998). These factors were titled Extrapunitive/Manipulative and Internal Perturbations. The Extrapunitive/Manipulative factor was characterized by reasons directed towards others, while the Internal Perturbations factor was marked by reasons related to guilt, failure, and a need to escape. The Internal Perturbation factor was positively and significantly associated with other indicators of suicidality, such as self-reported wish to die, clinician reported suicidal desire,

preparation for the attempt, and overall suicide risk, while the Extrapunitive/Manipulative factor was not associated with these indicators.

Holden et al.'s (1998) study was unique in that it included both suicide attempters and suicide ideators (who also reported on their hypothetical motivations). While ideators are an important and interesting group to examine, collapsing them with suicide attempters may have distorted the results. As will be reviewed below, research suggests that family members and clinicians attribute suicide attempts to interpersonal motives more so than suicide attempters. However, the authors did not report whether the ideators and attempters differed in the motivations they endorsed in this study. It is possible that the suicide ideators are more similar to outsiders who are judging the motivations for an event that has not happened to them.

Other RASQ studies were based on non-clinical populations. In a study by Johns & Holden (1997) only 12% of the sample had attempted suicide. This study found the Extrapunitive/Manipulative subscale only had a small correlation with a history of ideation and no relationship with a history of attempt. In contrast, the Internal Perturbations subscale was moderately correlated with both past ideation and past attempt. These results suggest that individuals whose reasons for suicide have to do with escaping their situation or state of mind, rather than influencing or communicating with people around them, are at a higher level of danger than those with other motivations. However, the conclusions of this study must be considered in light of the serious limitation that 88% of the sample was reporting on hypothetical attempt reasons.

In fact, much of the research using the RASQ has been with non-attempting populations, a confusing choice, as the purpose of the measure is to assess reasons for attempting suicide, which is a somewhat nonsensical question if one has not had an attempt. For example, Holden

and Kroner (2003) studied the RASQ with a forensic population in which only 17% of the sample reported a history of attempt. The misapplication of the questions to this sample is evident from the very low endorsement of either scale (e.g., mean of approximately 3 on a scale of 0-24). In 2000, Holden and McLeod published a paper based on a non-clinical sample in which only 9.5% of the 558 participants had attempted suicide. Here, they found support both for the original 2-factor solution and a novel 3-factor solution that split the Extrapunitive/Manipulative factor in two. They found that endorsing the Internal Perturbations subscale was more strongly related to a history of suicide attempt than either of the other two factors, similar to earlier findings.

The most appropriate group with which to evaluate this measure are suicide attempters, who can report directly about their own experience. Importantly, then, the two-factor solution was supported in a study that consisted of 134 attempters (Holden & DeLisle, 2006). In this study, participants were asked to rate whether each reason was applicable to their attempt, on a scale ranging from 1 (“completely disagree”) to 5 (“completely agree”). The mean endorsement on the Internal Perturbations subscale was 14 (range 0-24; 58.3 on a 0-100 scale). The mean endorsement on the Extrapunitive subscale was 8 (range 0-32; 25 on a 0-100 scale). Like earlier studies, internal motivations were endorsed more frequently than external ones. However, other studies of individuals with a lifetime history of attempt have found smaller (Horon, McManus, Schmollinger, Barr, & Jimenez, 2013) or no (Kene & Hovey, 2014) differences in the endorsements of the two sets of motivations.

By far, the largest study using a version of the RASQ is the WHO/EURO Multicentre Study on Suicidal Behaviour. This study included 1,646 participants from 13 European countries who were each interviewed within one week of their attempt (Hjelmeland et al., 2002). This

version of the RASQ (translated into the appropriate languages) asked the participants to rate each motivation as having “no influence,” “minor influence,” or “major influence” on the suicide attempt. A suicide attempt was defined as:

an act with nonfatal outcome, in which an individual deliberately initiates a nonhabitual behavior that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage, and which is aimed at realizing changes which the subject desired via the actual or expected physical consequences (Platt et al., 1999 p. 99).

It should be noted that this definition did not require a stated intent to die and excluded habitual self-injury.

A factor analysis of the RASQ results yielded four factors and a single item. The four factors were 1) Final Exit, 2) Temporary Escape, 3) Care Seeking, and 4) Influencing Others. The remaining item was: “It seemed that I lost control of myself, and I do not know why I did it.” The items on the Final Exit subscale were the most frequently endorsed, with the most common item endorsed being “the situation was so unbearable that I could not think of any other alternative.” The items on the Temporary Escape and Care Seeking scales were endorsed at a moderate level and the Influencing Others items were the least selected by far. For example, no more than 20% of respondents endorsed any single item on the Influencing Others subscale as having a major influence on their attempts, while up to 70% of respondents endorsed items on the Final Exit Scale as motivating their attempts.

As might be expected, scores on the Final Exit subscale were positively correlated with scores of suicidal intent as measured by the Suicide Intent Scale (Beck, Schuyler, & Herman, 1974), while the other subscales were not. Individuals whose reasons for suicide were

characterized by the feeling that they were in an intractable situation with no other options were also the most likely to express stronger intent to die during their attempt. Interestingly, very few significant differences were found among regions, genders, or ages in the endorsement of reasons for suicide attempts. The differences that were significant had very small effect sizes and were attributed to the power generated by the large sample size.

From the current literature it is difficult to determine if one factor structure is superior to another, as three possible factor structures have emerged from different investigations and only one large-scale study has been done. However, the factor analysis results of the original RASQ studies (Johns & Holden, 1997; Holden et al., 1998) were similar to those of the large European study (Hjelmeland et al., 2002); all of the items from the Care Seeking and Influencing Others subscales fell within the Extrapunitive/Manipulative factor and all the items from the Temporary Escape and Final Exit subscales fell within the Internal Perturbations factor. Thus, there appear to be at least two consistent main factors, one capturing intrapersonal reasons for attempts and the other capturing interpersonal reasons. Additionally, there is relatively consistent evidence that the intrapersonal reasons are more frequently endorsed than the interpersonal reasons.

Two studies have used the RASQ to examine reasons for attempting suicide among adolescents. Results were generally similar in the two studies and corresponded with data from adults, however there were some differences. One study evaluated 120 participants aged 12-17 in the ER or psychiatry ward directly after their suicide attempts (Boergers, Spirito, & Donaldson, 1998). They were presented with an early version of the RASQ including 9 items and asked to endorse as many items as were motivators for their attempts and then to identify a primary reason. The three items endorsed by over 50% of the sample were “to die,” “to get relief from a terrible state of mind,” and “to escape for awhile from an impossible situation.” The reason

selected by the most participants as their primary motive was to die. Those who endorsed a wish to die as a motive for their attempts differed significantly from those who did not endorse that motive. Those who wished to die were higher in depression, hopelessness, anger expression, and socially prescribed perfectionism. Adolescents did not differ in loneliness or family functioning. Additionally, 59% of the sample picked an intrapersonal reason as their primary motive, 23% picked an interpersonal reason, and 18% chose Other. This evidence corresponds with evidence from adults suggesting that intrapersonal reasons are more strongly endorsed than interpersonal reasons.

A Dutch sample of 48 adolescents aged 14-21 were studied 1 week to 1 year after their attempts (Kienhorst, Wilde, Diekstra, & Wolters, 1995). They were provided with a translated version of Bancroft's original reasons and asked to rate each item on a 7-point Likert scale. Endorsement was operationalized as rating the item 5 or greater. Over 50% of these adolescents also endorsed "to die," "to get relief from a terrible state of mind," and "to escape for awhile from an impossible situation" as motivations for their attempts. In addition, over 50% of the participants also endorsed two other reasons that were not on the version of the RASQ used with Boerger's sample. These were "to stop feeling pain" and "the situation was so unbearable that I had to do something and I didn't know what else to do." As was also true among Boerger's sample, the least selected reasons were interpersonal, such as revenge, influencing others, and help seeking.

Three studies demonstrate that participants' views of their reasons for attempting suicide often differ somewhat from those of their doctors, nurses, and significant others. Bancroft et al. (1979) found that patients and psychiatrists endorsed very different reasons for the patients' suicide attempts. Psychiatrists were most likely to choose communicating hostility and

influencing others as reasons for the attempt, while these reasons were the least endorsed by the patients themselves. More recently, Schnyder et al. (1999) interviewed 30 patients admitted to the hospital for a suicide attempt and found that, consistent with other studies, the reasons most commonly endorsed by attempters were “to escape a terrible state of mind” and “to get out of an unbearable situation.” Additionally, “losing of control and not knowing why one behaved that way” was also commonly endorsed. Reasons marked by communication were moderately endorsed and manipulative reasons were the least endorsed. Doctors and nurses were asked to fill out the RASQ for each of these patients immediately after their clinical interview. Doctors and nurses were significantly less likely to endorse “loss of control,” though there was overall agreement on the primary reasons for attempts. Additionally, doctors tended to select more of the manipulative reasons than the patients did, but this trend did not reach significance. It does seem that the gap between patients’ and doctors’ understanding is getting smaller, as the differences in reported reasons for attempting suicide were much greater in earlier studies (Bancroft et al., 1979). However, an alternative explanation is that as doctors and nurse have become more respectful of suicidal patients, their willingness to endorse what are seen as shameful reasons for an attempt has declined.

A similar study used a 9-item version of a precursor to the RASQ to assess 34 self-poisoners and their closest relative within 24 hours of their attempts (James & Hawton, 1985). The reasons most often endorsed by the attempters, generally consistent with other studies, were “to get relief from a terrible state of mind,” “to die,” and “to escape for awhile from a terrible situation.” Though both attempters and significant others saw the attempt as a way to deal with overwhelming distress, close relatives were much more likely to identify interpersonal reasons such as “make people understand how desperate they were feeling,” “seek help,” and “find out if

someone loved them.” They were significantly less likely to choose wanting to die as a reason their loved ones attempted suicide. In assigning reasons for attempted suicide, relatives are likely to be greatly influenced by their own experiences. For example, if they feel guilty and angry after the attempt, they may be more likely to infer that their relative attempted in part to create these feelings. It may also be difficult for individuals who have not considered suicide themselves to believe that their loved ones wanted to die.

Only one article was located that used a methodology other than explicitly asking participants to indicate their reasons for attempting suicide. Parker (1981) used the repertory grid technique to understand how attempters viewed their attempts in the context of other behaviors they could have engaged in when faced with a crisis. The researchers hypothesized that by using a more indirect assessment of motives they would circumvent some of the error introduced by social desirability. In the first phase of the study, recent suicide attempters were presented with a vignette about a conflict between two individuals and were then presented with 11 behavioral responses (e.g. expressing anger, getting drunk, seeking help, attempting suicide). Participants were asked to pick two potential responses to the conflict that had a common meaning and contrast them with a third and, in doing so, describe what was similar and different about the responses. For example, a participant might report that seeking help and talking the problem over are both sensible and thought out, while getting drunk is impulsive and desperate. 104 contrasting statements were generated (a mean of 5 comparisons per participant). The similarities and differences identified about the statements were then analyzed by a consensus group and condensed into 9 constructs, for example, a behavioral response was “sensible or thought out” versus “impulsive and desperate”.

In the second phase of the study, 29 different recent suicide attempters (all by overdose) were presented with the 9 constructs generated by the first participants. They were asked to think about each of the 11 possible behavioral responses (e.g., expressing anger, getting drunk, attempting suicide) in relation to the earlier crisis that led to their suicide attempt and to rate each behavior on a 7-point Likert scale for each of the 9 constructs (for example, “getting drunk” would be rated on a scale from “a way of hiding my feelings (-3)” to “a way of expressing my feelings (+3)”). Finally, factor analysis was used to interpret the results and specifically to understand how the participants viewed the suicide attempt as fitting into their repertoire of problem resolution strategies.

The analyses were divided between those with low suicidal intent and those with high suicidal intent. Those with low intent viewed their overdose attempts as distant from a deadly suicide attempt in the construct space; they saw overdoses as more similar to being alone and crying or getting drunk. The overdoses were seen as a desperate escape from tension while an attempt was seen as involving denial and suppression of problems. In contrast, the high intent group saw their overdose attempt as the closest construct to suicide and not at all related to crying or getting drunk. In the high intent group, both the overdose attempt and a deadly suicide attempt were seen as a communication of needs, an expression of feeling, and an escape from tension.

Though this study was conducted with a small sample and less powerful statistical techniques, it represents a unique approach. Rather than directly asking participants to retrospectively consider their reasons for attempting, they were asked to consider the function and effect of a number of possible reactions to their crises. It also allowed researchers to see what other behaviors the participants viewed as similar to their overdoses. Clearly the overdoses

represented a behavior with a heterogeneous mix of meanings and functions including both interpersonal (communication) and intrapersonal (escape from tension), supporting the need to better understand the complexities of suicide attempts.

Examining reasons for various types of self-injurious behavior may also be useful in distinguishing suicide attempts from non-suicidal self-injury (NSSI). Two studies examined the differing motives associated with these behaviors, which may appear very similar to the outside observer. Brown et al. (2002) used the Parasuicide History Interview (PHI) which assesses each occurrence of self-injurious behavior in the preceding year and rates each one as an unambiguous non-suicidal self-injury, ambiguous intention, or an unambiguous suicide attempt. This interview included a list of 29 motivations for self-injury generated through interviews with patients admitted to the hospital for such behavior. The sample for this study consisted of 75 women with borderline personality disorder and a persistent history of self-injurious behavior and generated 46 index episodes of NSSI and 29 suicide attempt episodes. NSSI episodes and suicide attempts did not differ in the most commonly selected motive, emotion relief. However, suicide attempts were more likely to be associated with an interpersonal motive, making other people better off, while NSSI episodes were more often associated with feeling generation, anger expression, and distraction.

An internet study of Flemish adolescents also investigated whether participants who endorsed only engaging in NSSI ($n = 183$) differed from those endorsing either suicide attempts or both attempts and NSSI ($n = 53$) in the reasons they gave for their actions (Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2011). A list of 7 reasons, derived from the RASQ, was used in this study. Youth who endorsed suicidal behavior (either with or without NSSI) were more likely to report engaging in the self-injurious behavior to stop negative thoughts or to see if

someone loved them. The design of this study did not allow for a direct comparison between reasons endorsed for suicidal behavior versus NSSI. However, it does suggest that there may be differences between the two groups. Understanding the reasons endorsed for NSSI may shed some light on the overlap and divergence between NSSI and suicide attempts.

In summary, there has long been interest in the motivations for suicide attempts. The measures used so far were generated from attempters' self-reports. They indicate that there may be two broad domains of reasons for suicide attempts, an intrapersonal domain and an interpersonal domain. Furthermore, preliminary research suggests that attempts motivated by these different reasons may be differentially related to other characteristics of attempts, such as lethality or intent. However, the significant shortcomings of the existing literature on suicide motivations must be considered.

1.3 Limitations of Research on Suicide Motivations

There are a number of important limitations to the existing work on motivations for suicide attempts. First, there are at least three shortcomings to the primary measure utilized in the majority of studies on motivations for suicide attempts, the RASQ. One issue is that its scales do not clearly align with the prevailing theories of suicidality today. In fact, a number of the theories were constructed far after the construction of the original items in the 1970's. For example, Roy Baumeister's escape theory (Baumeister, 1990) and the currently dominant theory of suicidality, the interpersonal theory of suicide (Joiner, 2005), were developed much later. This makes it difficult to use the RASQ to test the various conceptualizations of suicidality and to identify which best capture the true nature of suicide attempts.

A second issue with the RASQ is that its items were generated by a small sample of British inpatients engaging in a specific type of self-injurious behavior (overdose) approximately

45 years ago. This raises the question of whether the items fully capture all the possible motivations for suicidal behavior. Perhaps people who attempt with other methods, are different ages, have varying psychiatric diagnoses, or are from different socioeconomic backgrounds, may have distinct reasons. The generalizability and content validity of the measure are undetermined. As Ronald Holden, one of the authors of the RASQ, points out, “revisions to the current inventory could benefit from a consideration of a greater range of possible suicide motivations” (Holden & McLeod, 2000; p. 627).

Third, the structure of the RASQ remains uncertain. While early work indicated it had 2-factors (i.e. Internal Perturbation-Based Reasons, Extrapunitive/Manipulative Reasons), further analysis suggested that a 3-factor solution was more appropriate (i.e. Internal Perturbation-Based Reasons, Extrapunitive Motivations, Manipulative Motivations) (Holden et al., 1998; Holden & McLeod, 2000). The largest study of a version of the RASQ resulted in a 4-factor solution (i.e. Final Exit, Temporary Escape, Care Seeking, Influencing Other) and a single item that did not load on any of the factors. The most recent analysis, which included only suicide attempters, again found support for the original 2-factor solution (Holden & DeLisle, 2006). The instability of the factor structure raises doubts about the psychometrics of the measure. It also brings in to question how much confidence can be placed in the associations between other aspects of suicidality and specific motivation factors.

There are also at least three weaknesses to the research designs that have been used in the study of reasons for suicide attempts. First, a number of the studies reviewed above combined suicide attempters with suicide ideators and non-suicidal individuals, potentially confounding results. As reviewed, friends and family of attempters tend to attribute different motivations to suicide attempts than attempters do (James & Hawton, 1985). Asking non-suicidal

individuals to speculate on their reasons for hypothetical attempts is likely to introduce error and assumptions in to the results.

A second overall limitation of the research on motivations for suicide attempts is that studies often failed to distinguish between suicidal and non-suicidal self-injury. This is likely to cloud the results by combining analysis of two distinct but related behaviors. Research on non-suicidal self-injury has delineated specific functions for that behavior including intrapersonal reasons (e.g. affect regulation, self punishment, marking distress) and interpersonal reasons (e.g. interpersonal influence, demonstrating toughness, revenge) (Klonsky, 2011; Klonsky & Glenn, 2009; Turner, Chapman & Layden, 2012). Some preliminary research suggests that there are differences in the motivations for injuring oneself with or without the intent to die, highlighting the need to carefully define and assess intent when conducting research on self-injurious behavior (Baetens et al., 2011; Brown et al., 2002). Because NSSI is more prevalent than attempted suicide (Kessler, Borges, & Walters, 1999; Klonsky, 2011; Plener, Libal, Keller, Fegert, & Muehlenkamp, 2009; Tang et al., 2011), studies examining motivations of self-injurious behavior without regards to suicidal intent may be reporting results more relevant to NSSI than attempted suicide.

Third, the studies have generally failed to use one consistent measure to assess motivations. The number of items on the RASQ has varied from 7 to 14. Studies used inconsistent wordings for items, for example, “to get relief from a terrible state of mind” (Holden & McLeod, 2000), “to stop negative thoughts” (Baetens et al., 2011), and “my thoughts were so unbearable, I could not endure them any longer” (Hjelmeland et al., 2002). The large European study included 4 items with significantly different wording than the original RASQ (Hjelmeland et al., 2002; Holden et al., 1998). The rating scales have also varied and include a 7-point Likert

scale, a 5-point Likert scale, and a rating of level of influence with 3 levels of endorsement (i.e. major, minor, none). These inconsistencies limit the ability to synthesize results across studies and impede the establishment a basic foundation of suicide motivation literature. Hence, an important next step is to build on what has been learned from the RASQ and construct a reliable and valid measure of motivations that encompasses a broad range of potential motivations and is grounded in existing theories of suicidality.

1.4 Theories of Motivations for Suicide

The theoretical literature on suicidality has developed largely uninformed by the empirical literature on motivations. These theories should arguably inform the measures that are designed and used to assess motivations, if only to help evaluate, refine, and compare the different theoretical models. It should be noted that these theories are not mutually exclusive and some have conceptual overlap. The theories have been divided into primary and secondary theories. The primary theories are the most elaborated and have received significant attention in the field. The secondary theories encompass important constructs in suicidology that have not been fully explicated in complete models. This section will review first the primary, and then the secondary psychological theories of suicidality, one at a time.

1.4.1 Primary Theories.

1.4.1.1 Psychache.

Edwin Shneidman is perhaps one of the most influential suicidologists. Beginning with research on the content of suicide notes in 1949, he dedicated his career to researching, conceptualizing, and preventing suicide in a time when discussion of the topic was stigmatized and actively avoided. He founded the American Association of Suicidology in 1968, and began its associated journal, *Suicide and Life-Threatening Behavior*, in 1971.

Shneidman's theory of suicide revolves around the construct of psychache, a term he coined, as the basic reason for an attempt. Psychache is defined as "the hurt, anguish, soreness, aching, psychological pain in the psyche, the mind" (Shneidman, 1993, p. 51). Any emotional state can create psychache (e.g. sadness, shame, rage, guilt, alexithymia) and emotions only relate to suicide in as much as they contribute to psychological pain. He posits that suicide occurs when an individual's threshold for tolerating psychological pain is surpassed and that this threshold varies across individuals. Psychache is fueled by unmet psychological needs. What these needs are and the degree to which they cause pain also varies.

Shneidman's thinking on suicide evolved over his many years in the field. He originally discussed the "10 communalities of suicide" (1985) which he eventually distilled into a more parsimonious theoretical model, conceptualized as the "Cubic Model of Suicide" (see Figure 1; Shneidman, 1985; 1987; 1988). Each face of the cube represents one of the 3 components of this model. The cube is divided into 5 rows, 5 columns, and 5 planes, so that each of these 3 dimensions can be rated from 1 to 5.

The height of the cube is labeled "pain" and represents the psychache that Shneidman described as the key underlying motivation for suicide. This can be rated as "little pain" to "intolerable pain. The length of the cube represents "perturbation," a concept that includes both 1) the narrowing of cognitions to see suicide as the only solution and 2) a tendency towards impulsive behavior or action. This construct is sometimes described as the "psychological energy" (Jobes, 2006; p. 12) that powers the transition from suicidal ideation to suicidal attempt. Perturbation can be rated from low to high. Finally the width of the cube represents "press," which encompasses internal and external events that impact the individual. While these are most

commonly external occurrences, such as divorce, death, or job loss, they can also be internal experiences, such as hallucinations or core beliefs. Press can be rated from positive to negative.

The theory suggests that suicide can only occur amongst individuals who fall in the “5-5-5” square of the cube, where psychache, perturbation, and press are at their highest. Shneidman clarified that suicide is not the only outcome that this combination elicits, but that it is necessary for suicide to occur. The three factors are united when psychache is experienced to a degree that is deemed by the individual as untenable and the thought arises that the cessation of consciousness is the only (or best) solution.

Shneidman also recognizes self-denigration, isolation, and hopelessness as other key elements of a suicidal situation. More recent research has begun to try to disentangle the relationship between psychache and related constructs, such as hopelessness or depression. One research group examined the relationship among depression, hopelessness, and psychache in samples of undergraduates and homeless adults and found that psychache contributed the greatest unique variance to suicidality variables (DeLisle & Holden, 2006; Patterson & Holden, 2012; Troister & Holden, 2010). In a very recent study in our lab, we found that psychache best predicts suicide ideation in combination with hopelessness (Klonsky & May, 2015).

1.4.1.2 Escape theory.

Roy Baumeister presents a theory of suicide based on constructs from cognitive, social, and personality psychology. His escape theory posits that many suicide attempts are made possible and motivated by a need to reduce aversive self-awareness (Baumeister, 1990). A number of earlier investigations had identified “escape” as a reason for suicide attempts, but had failed to build a cohesive theory around this finding (Bancroft et al., 1976; Baechler, 1980).

Escape theory can be broken down into six steps (Vohs & Baumeister, 2000). A negative event occurs that highlights the gap between an individual’s desired self and actual self. This

may consist of a setback or may be the result of unrealistically high expectations or perfectionistic standards. Baumeister theorizes that high standards combined with setbacks are most likely to produce suicides, but clarifies that it is the magnitude of the gap between expectations and reality that is most important. For example, a man with a young family who was just about to purchase a house gets laid off from his job and can no longer afford the down payment.

The second step of escape theory is that the discrepancy is viewed as an indicator of the individual's failures and reduced self-worth. The self-attributions move from being about single events to more pervasive constructs. The more the failing is viewed as internal (i.e. produced by the individual), global (i.e. applying to other situations), and stable (i.e. unlikely to change), the greater and more lasting the negative views of one's self. If the discrepancy can be viewed as stemming from an external source, the progression to escape motivations for suicide is likely to be stopped. In our example, the man blames his inability to provide for his family on his own failings, rather than a poor economy, views himself as not able to be useful to his family in any domain, rather than simply financially, and believes that he will never be able to get back the financial stability to buy a house, rather than seeing his layoff as an unfortunate, but temporary, setback.

In the third step, attention is pointedly focused on the self. The negative event marks the distance between reality and a personal goal and self-attributions place the blame for the failure on the individual. As Baumeister (1990) states "the individual is therefore aware of the self as incompetent, dislikable, guilty, inadequate, or otherwise bad" (p. 91).

This strong negative focus on aversive beliefs about that self leads to the fourth step in the progression to escape motivated suicide, the generation of unpleasant affect. Believing one

has not met one's own standards can lead to feelings of sadness, depression, and shame, while believing that one is not living up to external standards can lead to anxiety and guilt. The man in our example now feels his sadness, shame, anxiety, and guilt strongly and pervasively.

The combination of accentuated self-awareness and strong, self-directed negative affect is a particularly aversive state that the individual then wants to escape, the fifth step. The individual may want to escape from the emotion itself, the aversive beliefs about that self, or both. Baumeister (1990) posits that the most automatic way to lessen all of these triggers is to revert to a more basic or "lower-level" pattern of thought, a process termed "cognitive deconstruction" (p. 92). This state involves focusing on physical sensations, one's surroundings, and immediate, proximal goals, thus avoiding any higher level thinking. For example, rather than thinking of unemployment, his self-worth, and plans for the future, the man in our example would focus on watching TV, driving to the liquor store, and his physical state. It is difficult to maintain a state of cognitive deconstruction, however, as more complex thought and reflection on the self often break through. The individual exists in a state that oscillates between emotional numbness and shockingly strong negative affect.

Finally, the consequence of cognitive deconstruction is an absence of thinking about the future, planning, or considering ethical principles, thus the individual may engage in actions that appear impulsive or mindless. In this state, inhibitions are reduced and suicidal action is more likely. The individual seeks a more permanent version of deconstructed cognition (an escape from aversive thoughts and feelings about the self) and is already in a state of greater inhibition and reduced ability to think rationally, due to the level of cognitive deconstruction that has been achieved. Thus the man may drink heavily, behave recklessly, and potentially seek to end his life.

Each of the components of escape theory combine to create a perfect storm in which suicidal behavior is the most likely outcome. Discord between goals and reality and an internal attribution create strong negative affect. Cognitions are deconstructed in an effort to avoid the painful higher level thoughts and their associated emotions. The resulting state is also unpleasant and hard to maintain. Furthermore, when higher-level thinking is avoided, it is easier to engage in impulsive actions and more difficult to generate other solutions to emotional pain. With each of these factors in place, escape theory suggests a suicide attempt is a likely outcome as it becomes an obvious and more lasting method of escaping troubling thoughts, emotions, and self-awareness. Suicide is, in essence, an escape from the self.

Research on escape theory is quite limited. Most of the studies that that have purported to examine the theory did not have measures and hypotheses that aligned closely with the major steps of the theory. For example, Reich, Newsom, and Zautra (1996) tried to test a 4-stage version of Baumeister's model for the development of suicidal ideation in older adults. However, they used confused thinking as a proxy for cognitive deconstruction, an operational definition, that, especially in older adults, would likely not capture the effortful avoidance of more complex thought that is intended by cognitive deconstruction. Furthermore, the research on Baumeister's theory has been cross-sectional, precluding the ability to examine the causal links that are central to escape theory (Dean & Range, 1996, 1999; Reich et al., 1996).

1.4.1.3 Interpersonal theory.

Thomas Joiner (2005; 2009) presents the most modern, comprehensive, and empirically testable theory of suicidality. His interpersonal theory posits that three domains must be present in an individual for suicide to occur. The first two domains, perceived burdensomeness and thwarted belongingness, confer the desire for suicide (e.g., suicidal ideation). The third domain, acquired capability, is needed in order for an individual to undertake potentially lethal self-harm

(e.g. suicide attempt). It is the unique combination of the desire to die and the capability to inflict potentially lethal self-harm that puts an individual in the danger zone for a serious suicide attempt or death (Figure 2).

Perceived burdensomeness is a self-view in which, worse than being worth nothing at all, an individual believes he or she is actually harming those around him or her. The idea is that one is so imperfect, weak, or broken that one's very existence burdens family, friends, and society. This leads to the thought that one's death will be worth more than one's life. Thus a suicide attempt may be motivated by relieving the burden on others that the suicidal person perceives himself to be. Important in this factor is the phrase "perceived." Overwhelmingly, the mental calculation of the suicidal individual is incorrect; however, he or she believes the trouble caused is a greater detriment than his or her own death.

Thwarted, failed, or low belongingness is the other half of the equation that leads to suicidal desire in Joiner's model. This concept aligns with alienation and social isolation, factors that are highly correlated with suicide (see Joiner, 2005 for a review). When an individual feels that he or she is not a part of a family, community, or society, an important bond that keeps one moored to life has been severed. The need to belong is one of the most powerful human motives, perhaps on par with that for survival and reproduction (Baumeister & Leary, 1995). Individuals may be motivated to attempt suicide in order to end the feeling of disconnection they experience when they feel that they do not belong to anyone or in any group.

While thinking that one is a burden and does not belong may impart the desire for suicide, Joiner hypothesizes that causing oneself potentially lethal self-harm is such a fearsome and anti-instinctual act that the ability to carry it out must be acquired over time. An individual must habituate to the physical pain and mental fear that are associated with suicide attempts. The

interpersonal theory of suicide suggests that capability can be acquired in a myriad of ways, from the most direct path, having past suicide attempts and engaging in non-suicidal self-injury, to more indirect paths such as war, abuse, risky substance use, participation in contact sports (e.g. martial arts, football), repeated exposure to others' injuries (e.g. doctors, first responders), or vivid daydreaming about one's attempt or death. When the innate fear of death begins to erode, behavioral changes come about, making the infliction of injury to the self more likely.

Additionally, psychological changes occur, shifting the response to death away from fear and avoidance and closer to appreciation and resolve. Individuals may report that the reason for attempting suicide was that fear had dissipated and suicidal wishes could be pursued. An emerging body of evidence provided initial support for the interpersonal theory (reviewed in Van Orden, Witte, Cukrowicz, Braithwaite, Selby, & Joiner, 2010), but not all studies have found clear support (see Christensen, Batterham, Soubelet, & Mackinnon, 2013; Pfeiffer et al., 2014).

1.4.2 Secondary Theories.

1.4.2.1 Hopelessness theory.

Cognitive psychologist Aaron Beck viewed hopelessness as the bridge between depression and suicide and much of his research has demonstrated that association (Beck, 1967). Two longitudinal studies by his research group found hopelessness strongly predicted future suicide deaths. An early study of inpatients with suicidal ideation found scores on baseline measures of hopelessness predicted suicide death over the next ten years, while the severity of depression and the severity of suicidal ideation did not (Beck, Steer, Kovacs, & Garrison, 1985). A more recent large 20-year prospective study of psychiatric outpatients found that, in univariate models, high levels of hopelessness increased the risk of death five fold, though, when included in multivariate analyses with demographic and diagnostic variables, hopelessness no longer accounted for unique variance (Brown, Beck, Steer, & Grisham, 2000).

Interest in the relationship between suicide and hopelessness has generated a great deal of empirical work. Hopelessness is one of the most widely found correlates of suicidal ideation, having been identified as a risk factor for current ideation, predictive of future ideation, and perhaps a mediator of ideation, linking stress and problem-solving deficits to suicidality (reviewed in Brezo, Paris, & Turecki, 2006).

In relation to suicide attempts and deaths rather than ideation, the picture is somewhat more mixed when all of the literature is considered. Among adults, about two thirds of studies have found hopelessness differentiated attempters from controls, while about one third did not (reviewed in Brezo et al., 2006). Some of the confusion in these findings may result from the mixed characterization of hopelessness as both a state and a trait. An interesting examination of this distinction found that among a sample of 316 individuals with mood disorders, baseline hopelessness (the estimated level of hopelessness when one is not depressed) predicted subsequent suicide attempts over an eight-year period, while level of hopelessness during a particular mood episode did not (Young et al., 1996).

Building on Beck's work and the growing interest in hopelessness, Lyn Abramson and colleagues developed the hopelessness theory of suicidality from their hopelessness theory of depression (Abramson, Metalsky, & Alloy 1989). This theory posits that the combination of 1) an expectation that either a highly desired outcome will not occur or that a highly aversive outcome will occur, with 2) the perception that one cannot influence or change the situation, is a proximal cause of depression. This is a diathesis-stress model, requiring that both a negative event and a cognitive vulnerability be present for hopelessness to occur. Suicidality is viewed as a symptom of this type of depression. It is thought that suicidality is most likely to occur when the events generating the hopeless thoughts are seen as important, enduring, global, likely to

contribute to further problems, and reflecting negatively on the individual (Abramson et al., 2000). Clearly this theory has similarities to the early stages of Baumeister's model, as disappointment, helplessness, and self-blame play key roles in both.

The authors postulate that suicidality is mediated by hopeless thinking, however this research is still young. Negative beliefs about the future and helpless thoughts are key contributors to hopelessness, which motivates the suicide attempt. Prospective research in college students found that hopelessness mediated the relationship between a vulnerable cognitive style and suicidality, even when controlling for other related factors such as past suicidality, depression, and personality disorder features (Abramson et al., 1998). Hopelessness has also been found to have a direct and independent relationship with suicidality when controlling for depression, anxiety and loneliness (Joiner & Rudd, 1996; Thompson, Mazza, Herting, Randell, & Eggert, 2005).

1.4.2.2. Communication theories.

Suicide attempts have long been viewed as an interpersonal action. From the 1960's-1980's, in particular, the belief that suicide attempts were a form of communication was especially prevalent (Chopin, Kerkhof, & Arensman, 2004). In some cases attempts have been seen as a way to signal distress and communicate an individual's pain or needs, in other words, a "cry for help" (Farberow & Shneidman, 1961; Trout, 1980). Norman Kreitman (1977) viewed suicide attempts as part of a pathological communication system. He theorized that if one individual began using self-injurious behavior as a way of communicating and those messages were received by the individual's friends and family, then some of those individuals would pick up the language, so to speak. He theorized this was a way to explaining suicide clusters and the possible contagious nature of other types of self-injury. Kobler and Stotland (1964) hypothesized that suicide attempts were a way of asking for help. If hope and help were proffered, then further

suicidal behavior would cease. However, if a message of helplessness and the inevitability of suicide were transmitted, then further, more serious attempts were likely.

Influencing or changing the behavior of someone else has also been thought to be an interpersonal motivation for attempts. Erwin Stengel believed suicide attempts inherently impacted others (Stengel, 1969). Attempts tend to change an individual's environment, often eliciting displays of love and caring, a reduction in social isolation, and a decrease in responsibilities (Stengel, 1964). Stengel believes that these responses then factor in to the suicidal individual's next action. If the problems prompting the attempt are sufficiently alleviated, no further suicidal action occurs. If the response is not sufficient, a more severe attempt may result. Additionally, for some, operant conditioning may begin so that, if similar problems present themselves in the future, suicidal behavior may be seen as an effective response. However, Stengel also made it clear that communicative motivations for attempts may be subconscious, especially at the time of the first attempt.

Maris (1981), in a somewhat similar line of thinking, indicated that the primary goals of attempted suicide are manipulation and attention-seeking. He suggested that "suicidal careers" begin early with childhood traumas and problematic families. This then sets up the individual for a self-destructive response to crisis. Suicide attempts are primarily motivated by a desire to change the environment, rather than to die. The suicide attempt then becomes a conditioned response that the individual learns to use to cause change in his or her environment.

Adolescent and youth suicides are especially likely to be viewed as motivated by a communication function. In interviews with young people who survived their suicide attempts, Giffin and Felsenthal (1983) observed that many reported that part of their motivation had been to get the attention of their parents, as they felt all other methods of communication were

blocked. As described earlier, research suggests that medical professionals and family members are somewhat more likely to attribute a communicative motive to an attempt than the suicidal individual themselves (Bancroft et al., 1979; James & Hawton, 1985; Schnyder et al., 1999).

1.4.2.3 Impulsivity.

The suicidology field has long believed that impulsivity is a key contributor to suicide attempts (Simon et al., 2001). For example, Mann, Waternaux, Haas, and Malone (1999, pp. 181) present an influential clinical model of suicidal behavior suggesting that impulsivity makes individuals “more likely to act on suicidal feelings.” Their conclusions stem from their empirical work with 347 psychiatric inpatients with heterogeneous diagnoses (Mann et al., 1999). Comparing those with histories of suicide attempts to those without, they found that a factor encompassing impulsivity and aggression was a strong predictor of attempt history regardless of diagnosis or severity of suicidal ideation. They posit that low serotonergic activity may be responsible for the increased impulsivity and aggression, or what is known as “disinhibitory” psychopathology. They suggest suicide attempts may be caused by the combination of a greater likelihood of acting on feelings and suicidal ideation.

There is not a specific theory, per se, that suggests impulsivity is a motivator for suicide attempts, but many empirical studies, such as the one described above, have observed an association between measures of impulsivity and suicide. Impulsivity has been identified as higher in suicide attempters than non-attempters on both self-report and laboratory measures (Dougherty, Mathias, Marsh, Moeller, & Swann, 2004; Gorlyn, 2005; Horesh, 2001).

Clinical wisdom has also long suggested a role of impulsivity in suicidal behavior. In an article aimed at clinicians integrating advances in suicide risk assessment Bryan and Rudd (2006, pp. 195) state that impulsivity “may actually be a more significant indicator of suicide attempt than the presence of a specific suicide plan.” Furthermore, impulsivity is often highlighted as a

risk factor for suicide in clinical guidelines. The Centre for Addiction and Mental Health, Canada's largest mental health teaching hospital, includes "impulsive personality" among a short list of suicide risk factors (camh.ca, 2011), as does the United State's Substance Abuse and Mental Health Administration's Quick Guide for Clinicians (SAMSHA, 2013). Prevention organizations also often list a history of "impulsive behavior" and "impulsive tendencies" as a suicide warning sign or risk factor (AAS, 2013; AFSP, 2014).

However there is also substantial controversy in the field over the relationship between impulsivity and suicide, particularly whether suicide attempters are truly higher in trait impulsivity and whether suicide attempts themselves can be impulsive. Many facets of impulsivity are, in fact, no different in suicide attempters compared to suicide ideators (though they are often higher in nonsuicidal populations), including acting on impulse when faced with negative emotions, lack of perseverance, and sensation-seeking (Klonsky & May, 2010). In fact only having difficulty thinking through the consequences of actions was higher amongst attempters compared to ideators. Importantly, a recent meta-analysis found the overall relationship between trait impulsivity and suicidal behavior was small ($g = .34$; Anestis, Soberay, Gutierrez, Hernandez, & Joiner, 2014).

Regarding the relationship between trait impulsivity and impulsive attempting, Baca-Garcia et al. (2005) found that there was no relationship between the "trait" levels of impulsivity of attempters and the "state-level" impulsivity of their actual suicidal acts (as measured by degree of suicidal planning). Joiner (2005) hypothesizes that any relationship between impulsivity and suicidal behavior is mediated by impulsive individuals experiencing more painful and provocative events and these experiences then increasing the individuals' ability to inflict lethal harm on themselves. There is emerging evidence for this conceptualization (Bender,

Gorden, Bresin, & Joiner, 2011; Witte et al., 2008). The complex and inconsistent relationship between impulsivity and suicide clearly warrants further investigation.

1.4.2.4 Problem solving.

French sociologist, Jean Baechler (1979) formulated a theory of suicidality based on the premise that a suicidal act is the rational solution to a problem and that the motivation for the suicide would vary based on the problem being solved. Baechler was not interested in empirical data and developed his types based on 127 case studies and literary figures. He also dismissed the idea that suicide was pathological, insisting that it was a logical response to a problem.

He put forth four general types of suicide. The first type was “escapist,” where the motivation of the act was to take flight from a situation. The second type was termed “aggressive” and captures multiple interpersonal motivations for an attempt, including trying to provoke a reaction in someone else and alerting close friends that the individual is in danger. These two types mirror some of the other more developed theories, such as Baumeister’s escape theory and the “cry for help” phenomena. Baechler third type was the “oblative” suicide type, in which the individual is motivated by either by the thought that their suicide will benefit another or that they will attain a more desirable state in death. This type appears similar to the burdensomeness facet presented in Joiner’s interpersonal theory. The fourth type of suicide was “ludic” and is motivated by proving oneself to others or simply enjoying the risk taking of playing with one’s life. This type is similar to the “impulsive attempt” conceptualization of suicidality.

In an effort to examine whether Baechler’s categories applied to suicidal individuals, researchers conducted interviews with 5 suicide ideators, 17 suicide attempters and the family and therapists of 5 individuals who died of suicide (Smith & Bloom, 1985). Through coding of their unstructured interviews they found that each motivation for suicide was endorsed by a sizable percentage of the respondents, with the exception of the oblative type. Records of 35

Royal Canadian Mounted Police officers who had died of suicide were abstracted and coded for motive based on Baechler's typology (Loo, 1986). The study found that the majority of the suicides could be characterized as having an "escape" function. However, given the methodology of the study, it is hard to determine whether other motivations, such as communicative or help-seeking would have been as readily apparent to investigators postmortem.

Baechler's work was novel in that it did not adhere to a particular framework for suicidality (e.g. psychoanalytic, sociological). Instead he treated each case study as a guide to the functions of that individual's suicidal behavior. Furthermore, as Shneidman (2001) points out, Baechler broadened the list of functions for attempts beyond what the field was considering at the time. Interestingly, his types of suicide attempts map on to many of the theories of suicide developed after he presented his work. Baechler (1979) recognized the fallibility of his typology system:

I am uncertain of the validity of my own types. I have distinguished 11 of them, which I have grouped together into four categories. It is perfectly possible that I have found too many or too few, that I have invented them where none exist, or that they are too coarse. I have yet to find the experiment to verify my hypothesis" (p. 204).

The interest in a typology of suicide attempts has remained in the field, though research has not made great strides in developing an empirically sound system. The development of a measure that systematically assesses motivations for attempts as they have been theorized is an ingredient in the development of such a taxonomy.

1.5 Overview of the Dissertation

Suicide is the one of the most severe outcomes possible in the field of mental health. Though research has been growing and stigma dropping, there has been no consistent reduction

in suicide rates over the past 50 years. By better understanding the reasons that individuals make suicide attempts, we may be able to develop more effective prevention campaigns, conduct more accurate risk assessments, and provide more targeted interventions. The utility of the currently available tool for understanding motivations for suicidal behavior is limited by a restricted domain of items and an unstable factor structure. Further, the literature on reasons for attempting suicide using this tool has been muddied by the use of nonsuicidal samples and by altering the wording, response options, and set of items included.

Hence, the goals of this dissertation are to 1) develop a comprehensive measure of motivations for suicide attempts that includes those suggested by the breadth of major theories of suicidality, 2) establish the psychometric properties of the IMSA in multiple, distinct samples of suicide attempters, 3) identify the most prevalent motivations for suicide attempts, and 4) explore how suicide attempt motivations relate to different clinical presentations and levels of suicide risk by examining the association of motivations for suicide attempts to characteristics of suicide attempts (e.g., lethality, intent, pre-attempt communication). Specifically, Study 1 describes the development and initial testing of Inventory of Motivations for Suicide Attempts in undergraduates and outpatients with recent suicide attempts (Chapter 2). Study 2 assesses motivations for attempts, psychometric properties of the IMSA, and clinical correlates of motivations in a critical population: inpatients admitted to psychiatric wards for acute suicide attempts (Chapter 3). In Study 3, the motivations for attempt, structure of the IMSA, and clinical correlates are examined in a large, diverse sample of participant with lifetime suicide attempts drawn from across the United States (Chapter 4). In Study 4, motivations, psychometric properties and clinical correlates are explored among a different age group, adolescents admitted to the hospital for suicide attempts (Chapter 5). Results between and across studies are then

briefly explored (Chapter 6). The dissertation concludes by summarizing and integrating the findings across all four studies and discussing implications and directions for future research (Chapter 7).

2 Study 1: Measure Development and Initial Validation

Note: This chapter is heavily based on the published article, *Assessing Motivations for Suicide Attempts: Development and Psychometric Properties of the Inventory of Motivations for Suicide Attempts* (May & Klonsky, 2013). The N's between the two papers are slightly different due to different approaches to handling missing data. None of the substantive conclusions have changed.

2.1 Introduction

Study 1 had four aims: 1) to develop the Inventory of Motivations for Suicide Attempts (IMSA), a comprehensive measure of motivations for suicide attempts with scales that are keyed to the major theories of suicidality, 2) to establish the psychometric properties of the IMSA in two samples of recent suicide attempters, 3) to identify the relative importance of different attempt motivations, and 4) to explore how suicide attempt motivations relate to different clinical presentations and levels of suicide risk by examining the association of motivations for suicide attempts to characteristics of suicide attempts (e.g. lethality, intent, pre-attempt communication).

2.2 Methods

2.2.1 Development of Measure

The Inventory of Motivations for Suicide Attempts (IMSA) was developed as follows. Based on the prevailing theories of suicidality and discussions with other suicide researchers and clinicians, 4 items were generated for each of 10 scales: Hopelessness, Psychache, Escape, Burdensomeness, Low Belongingness, Fearlessness, Help-Seeking, Interpersonal Influence, Problem-Solving, and Impulsivity.

We sought to be over-inclusive in the perspectives represented on the IMSA, in the hopes of capturing a wide array of plausible motivations. Some of the domains covered by the IMSA are motivations that may be sufficient in and of themselves to lead to a suicide attempt (e.g., Hopelessness), while others are factors that may increase one's motivation to choose such a course of action (e.g., Fearlessness). Additionally, each scale is considered a possible motivation for choosing a particular behavior (suicide attempt), rather than a motivation for feeling suicidal in the first place. For example, fearlessness or impulsivity may be important factors in motivating the choice to attempt suicide, though they would not be reasons that one would feel suicidal. That is, reduced fear of death may be motivation for choosing suicidal behavior, rather than another course of action, in the face of overwhelming emotions or the desire to influence another person.

Items were written by the author and were edited and refined in consultation with her advisor. For the Hopelessness scale, the work of Aaron T. Beck (Beck, Steer, Kovacs & Garrison, 1985; Beck, Brown, Berchick, Stewart, & Steer, 1990) and Lyn Abramson (Abramson, Metalsky & Alloy, 1989; Abramson et al., 2000) was consulted, specifically the Beck Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974), from which the wording of one item was used directly (i.e. "My future seems dark"). For the Psychache scale, items were based on the work of Edwin Shneidman (1993) as well as Holden, Mehta, Cunningham, & McLeod's (2001) Scale of Psychache. Items on the Escape scale were constructed using the work of Roy Baumeister (1990). The Burdensomeness scale and Low Belongingness scale were developed from Thomas Joiner's writings on the interpersonal theory of suicide and the Interpersonal Needs Questionnaire (Van Orden, Witte, Gordon, Bender, & Joiner, 2008). The Fearlessness scale was also based on Joiner's interpersonal theory and an associated measure, the Acquired Capability for Suicide

Scale (Van Orden et al., 2008). No items were used directly from either of Joiner's measures. The items for the Help-Seeking scale and Interpersonal Influence scale were produced by consulting the Reasons for Attempting Suicide Questionnaire (Holden et al., 1998) and the Suicide Attempt Self Injury Interview (Linehan et al., 2006). Items on the Problem-Solving scale were generated by the research team and were inspired by Jean Baechler's (1979) original premise that suicidal behavior was a rational response to solve a specific problem, though they were not associated with his typology of attempts. The items on the Impulsivity scale were written by the author and informed by her lab's work (Klonsky & May, 2010). Four additional items that did not align with a specific scale, but were of interest, were also produced.

After approximately 30 pilot participants with recent suicide attempts completed the measure, descriptive statistics and coefficient alphas were calculated to assess the functioning of the scales. Based on these analyses and low alphas for some scales, one more item was added to each scale, for a total of 5 items per scale and 54 items on the complete measure.

Respondents were asked to bring their most recent suicide attempt to mind and to complete the stem "I attempted suicide because I..." by endorsing each item (0 – Not at all important, 1 – Somewhat important, 2 – Important, 3 – Very important, 4 – Most important). Examples of items include "...could no longer tolerate my emotional pain" and "...needed to persuade someone to change his or her mind" (See Appendix 1). The complete measure was then administered to two samples of recent suicide attempters, as detailed below.

2.2.2 Recruitment and Data Cleaning

Two samples were obtained. For Sample 1, undergraduates who had attempted suicide within the previous three years and were at least 19 years of age were recruited through advertisements posted around campus and an extra credit system for psychology undergraduates. For Sample 2, outpatients who attempted suicide within the previous three years, were at least 19

years of age, and were currently receiving mental health treatment (either therapy, psychiatric medication, or both) were recruited from the community by way of online ads, announcements at mental health community organizations, and posters throughout Vancouver.

A suicide attempt was defined as “self-inflicted, potentially injurious behavior with a nonfatal outcome for which there is evidence of intent to die” (Silverman, Berman, Sanddal, O’Carroll, & Joiner, 2007). Potential participants answered screening questions to determine whether their experience fit the study’s definition of an attempt. Specifically, they were asked whether they had tried to hurt themselves with at least some intent to die. The attempt was then further assessed with a semi-structured interview during the study visit (see measures below). Exclusion criteria for both samples included either language or cognitive barriers that prevented completion of the study protocol. Signed informed consent was obtained from all participants. The study was approved by the University’s Behavioral Research Ethics Board.

Eligible participants attended a 2-hour research session in which they completed questionnaires and a semi-structured interview. At the end of the session participants were debriefed as to the purpose of the research, positive coping strategies were highlighted as a reminder of healthy ways to manage distress, and current feelings of safety were assessed. The interviewer then provided each participant with a packet of resources, including local and affordable mental health care clinics, as well as 24-hour crisis numbers. Participants were compensated either with extra credit points or \$30, and bus fare or parking validation if needed.

Missing data was analyzed. On the IMSA, if a scale was missing only one item, the mean of the four remaining items was used to calculate the scale mean. This occurred in 4 instances across 1,190 scale scores calculated. No participants skipped more than one item on any given scale. Data were also examined for outliers (i.e., a mean of 4 or more standard deviations above

the scales mean within the sample) of which there were none. Thus, 119 participants were included in the analyses.

2.2.3 Participants

Sample 1 consisted of 66 undergraduates with suicide attempts during the previous three years. The sample was predominantly female (79%), aged 19-41 (*Mdn* = 21, *IQR* = 20-23). Regarding ethnicity, the sample was 50% of East Asian descent, 23% of Indian-South Asian decent, 15% of European descent, 9% of mixed descent, and 3% of Middle Eastern descent. Twenty-six percent reported having a minority sexual orientation (i.e. gay, lesbian, bisexual, questioning). Most participants described themselves as single (74%). The remaining participants were divorced/separated (2%), married (3%), or other (20%).

Regarding history of suicidality, participants reported an onset of suicidal ideation in the mid-teens (*Mdn* = 14, *IQR* = 13-17) and a median of 2 lifetime suicide attempts (*IQR* = 1-3). The most common methods used in the most recent attempt were overdose (53%), cutting/stabbing (21%), other (14%), hanging (5%), drowning (5%), fire (3%), and car crash (1%). The attempt assessed occurred a median of 1.7 years before the study appointment (*IQR* = 0.7-2.5 years). Among the undergraduates, 44% of the sample reported requiring medical attention after their attempt.

Sample 2 consisted of 53 outpatients with suicide attempts during the previous three years. Approximately half of the participants were female (53%), aged 19-71 (*Mdn* = 36, *IQR* 28-48). Regarding ethnicity, the sample was 50% of European descent, 15% of East Asian descent, 12% of First Nations decent, 8% of mixed descent, 6% of Latin American decent, 4% of Middle Eastern descent, 4% of other descent, and 2% of Indian-South Asian decent. Nineteen percent reported having a minority sexual orientation. Most participants described themselves as single (57%). The remaining participants described themselves as divorced/separated (22%),

other (13%), or married (7%). Regarding education level, 25% reported partial high school, 38% reported high school graduation or some college, 26% reported college graduation, and 11% reported further education. Thirty-nine percent of the sample reported currently working outside the home.

Regarding history of suicidality, participants reported an onset of suicidal ideation in the mid-teens (*Mdn* = 16, *IQR* = 12-17) and a median of 2 lifetime suicide attempts (*IQR* = 2-4). The most common methods used in the most recent attempt were overdose (62%), cutting/stabbing (13%), drowning (6%), jumping (6%), stepping into traffic/train tracks (6%), hanging (4%), carbon monoxide (2%), and other (1%). The attempt assessed occurred a median of 1 year before the study appointment (*IQR* = 0.3-2.5 years). Among the outpatients, 61% of the sample reported requiring medical attention after their attempt.

2.2.4 Measures

2.2.4.1 Demographics and suicide history.

A standard demographics form collected information about sex, age, race/ethnicity, sexual orientation, and marital status. Items adapted from the Self Injurious Thoughts and Behaviors Inventory (SITBI; Nock, Holmberg, Photos, & Michel, 2007) assessed age at first ideation.

2.2.4.2 Attempt motivations.

The primary measure of interest, the Inventory of Motivations for Suicide Attempts (IMSA; May & Klonsky, 2013) was described extensively above. The RASQ is a 14-item self-report measure with a 7-point Likert scale that assesses 2 superordinate dimensions: the Internal Perturbation-Based Reasons Scale and the Extrapunitive/Manipulative Motivations Scale. The RASQ (Holden et al., 1998; Johns & Holden, 1997) was used evaluate the construct validity of

the IMSA. For the RASQ, data was imputed if a scale was missing no more than 1 item. This occurred in 3 instances across the 238 scales calculated.

2.2.4.3 Attempt characteristics.

Details of the most recent attempt were assessed with the Suicide Attempt and Self Injury Interview (SASII; Linehan et al, 2006) and the Suicide Intent Interview (SIS; Beck et al., 1974). The SASII is a semi-structured interview designed to assess the frequency, method, severity, context, intent, reasons, and outcomes of self-injurious behaviors. It consists of open-ended, forced choice, yes/no, and Likert rated questions. The validity of SASII items has been established by comparing interview reports with therapist note, medical records, and coding by expert raters (Linehan et al., 2006). This interview was used to assess the details of the most recent suicide attempt. Episodes of non-suicidal self-injury were not assessed. Each item included in our analyses is described in more detail below.

The attempt method was coded from open-ended and follow up questions on the SASII that inquired about the nature and methods of the attempt.

Intent to die was assessed two ways. First, the SASII includes an item that asks the participant to endorse a description of their intent directly before the attempt ranging from 0 (“Not at all”) to 6 (“I was extremely serious, intended to die, and was not ambivalent/unsure at all”). This item is referred to as intent (self-endorsed). Second, the SIS, a 15-item interviewer coded measure of suicide attempt intent, was scored. SIS items are scored 0-2 and then summed, with higher scores reflecting greater intent. The SIS has been shown to have good internal reliability and concurrent validity (Ojehagen, Regnell, & Traskman-Bendz, 1991; Power, Cooke, & Brooks, 1985). The SIS total score is referred to as intent (interview-rated).

The pre-attempt communication variable is a composite of two SASII items. One assesses direct, indirect, or no mention of suicide before the attempt. The second item assesses direct, indirect, or no threats of suicide before the attempt. The items were combined and dichotomized into any or no pre-attempt communication.

Probability of intervention was assessed in two ways. First, a SASII item asked “Did you arrange your attempt in such a way that it would be difficult for anyone to find, stop, or save you?” Response options were no, somewhat, and yes. The item was coded such that higher scores reflect a greater likelihood of intervention. This item is referred to as probability of intervention (self-endorsed). Second, SASII interviewers were asked to code the likelihood of intervention on the attempt based on all the information gathered through open-ended and follow up questions. Response options ranged from 1 (“Chance of intervention remote”) to 5 (“Certain intervention”). This item is referred to as probability of intervention (interviewer-rated).

Medical risk of death was coded based on information gathered during the interview. Response options ranged from 1 (“Very low”) to 6 (“Severe”). Each option included specific examples such as the number of pills taken, the type of wound inflicted, or the height from which a jump took place. Lethality was assessed with a SASII item that asks “What was your physical condition after your most recent suicide attempt?” and offers 7 options from 0 (“My physical condition was not affected”) to 6 (“My physical condition was extremely severely affected (e.g., cardiac arrest; systemic organ failure; gun shot in chest or head)”). Examples are provided with each response option.

2.3 Results

2.3.1 A Note on Language

Consistent and specific terminology is essential to scientific discourse. Hence, correlations between .10-.19 are referred to as weak, .20-.29 as small/modest, .30-.49 as medium/moderate, and .50 and above as large/strong.

2.3.2 Descriptive and Internal Consistency Statistics of the IMSA

Means, standard deviations, and coefficient alphas of the 10 IMSA scales were calculated separately for each sample (Table 1). The mean endorsement levels of the scales were similar in the two samples, with Hopelessness, Psychache, and Escape having the highest mean endorsement and Interpersonal Influence, Help-Seeking, and Impulsivity having the lowest. Two scales were rated as at least “important” by over 90% the sample, Hopelessness and Psychache. All scales had a coefficient alpha of .66 or greater with the exception of Problem-Solving (undergraduates: $\alpha = .55$; outpatients: $\alpha = .47$). The items on the Problem-Solving scale did not group together, perhaps because each item tapped in to a different type of problem (e.g. “It could fix some important practical problems for my family;” “I needed to prevent someone from hurting me”). As Problem-Solving statements were widely endorsed, they were retained as individual items. Thus, the subsequent analyses focused on the nine remaining scales. Correlations among the scales were examined (Table 2). Relationships were generally weak to moderate. Interpersonal Influence and Help-Seeking were the most highly correlated (undergraduates: $r = .68$ and outpatients: $r = .70$). The scales were sufficiently distinct to be used individually.

2.3.3 Factor Structure

Exploratory factor analysis of the IMSA was conducted with principal axis factoring and promax rotation. Promax rotation was chosen as there was no reason to believe the factors would

be orthogonal. Bartlett's test of sphericity was significant, indicating there was sufficient collinearity to proceed with a factor analysis. The KMO statistics, which describes the degree of diffusion in the pattern of correlations, suggest good sampling adequacy (.68-.75).

Notably, inspection of eigen-values and scree plots indicated factor solutions in each sample that were extremely similar (Table 3). The first factor, which we labeled Internal, consists of internal motivations related to distressing states of mind (Psychache, Escape, Hopelessness, Burdensomeness, Low Belongingness, Fearlessness; eigen value = 3.0-3.5). This factor accounted for 33.1% of the variance in the undergraduate sample and 38.7% of the variance in the outpatient sample. The second factor, which we labeled Communication, consists of other-focused motivations relating to a desire to reach out to or influence others (Help-Seeking, Interpersonal Influence; eigen value = 1.5-2.0). This factor accounted for 17.2% of the variance in the undergraduate sample and 21.9% of the variance in the outpatient sample.

Next, scores from the scales loading on each factor were summed to form an Internal Motivations factor and Communication Motivations factor. Although Hopelessness exhibited a negative loading (-.43) on the Communication Motivations factor in the outpatient sample, we opted not to include reverse-scored Hopelessness on this scale because the loading on the Internal Motivations factor was more robust (.64), and Hopelessness has a negligible loading on the Communication Motivations factor in the undergraduate sample (-.02). The Impulsivity scale was not included because it failed to load at .40 on either factor. Coefficient alphas for the items on the Internal Motivations factor (undergraduates: $\alpha = .73$ and outpatients: $\alpha = .84$) indicate good internal consistency. The Spearman-Brown reliability coefficient was calculated for the Communication Motivations factor (undergraduates: $r_{sb} = .81$ and outpatients: $r_{sb} = .82$) indicated good internal consistency. The factors were minimally correlated with each other

(undergraduates: $r = .26$; outpatients: $r = .19$), supporting their distinct identities.

2.3.4 Convergent and Divergent Validity

We next examined convergent and divergent validity by correlating the two IMSA factors with two RASQ dimensions: Internal Perturbation and Extrapunitive/Manipulative (see Table 4). The RASQ Internal Perturbation-Based Reasons scale of the RASQ is conceptually similar to the IMSA Internal Motivations factor in that it assesses motivations related to psychological pain, while the RASQ Extrapunitive/Manipulative Motivations scale is conceptually similar to the IMSA Communication Motivations factor in that it measures other-oriented reasons for attempting. As expected, in both samples the IMSA Internal Motivations factor correlated strongly with the Internal Perturbation-Based Reasons scale of the RASQ (r 's = .58 and .62), and the IMSA Communication Motivations factor correlated strongly with the Extrapunitive/Manipulative Motivations scale (r 's = .83 and .78). These correlations support the IMSA's convergent validity. In support of divergent validity, the correlation between the IMSA Internal Motivations factor and RASQ Extrapunitive/Manipulative scales, and the correlation between IMSA Communication Motivations factor and RASQ Internal Perturbation scales, were weak and non-significant in both samples (r 's = .05 - .18). Furthermore the correlation between the IMSA Internal Motivations factor and each of the RASQ scales was significantly different (Z 's = 2.7 and 3.1, p 's < .01). Similarly, correlation between the IMSA Communication Motivations factor and each of the RASQ scales was also significantly different (Z 's = 5.5 and 4.7, p 's < .001).

2.3.5 Clinical Correlates

Finally, we conducted exploratory correlational analyses to examine how IMSA motivations relate to characteristics of the suicide attempt (combining undergraduates and outpatients into a single sample). Descriptive statistics for the attempt characteristics are

provided in Table 5 and correlation are provided in Table 6. The IMSA Communication Motivations factor was modestly related to a greater probability of intervention, as coded by the interviewer ($r = .22$), weakly to modestly related to less suicidal intent (r 's = $-.18$ and $-.22$), and weakly related to using a less risky attempt method ($r = -.13$). The Internal Motivations factor was weakly associated with greater intent (r 's = $.15$ and $.18$), using riskier methods ($r = .13$), and reduced likelihood of intervention ($r = -.12$). There was no relationship between either factor and pre-attempt communication, self-endorsed probability of intervention, or lethality.

In addition, the IMSA includes a single item that evaluates “wanting to die” as an attempt motivation. Virtually all participants (92%) endorsed this item to some degree, though there was variation regarding how important this motivation was perceived to be. This item was moderately related to greater Internal Motivations ($r = .37$) and not related to Communication Motivations ($r = -.07$).

3 Study 2: Psychometrics and Correlates of the IMSA among Adult Inpatient Suicide Attempters

3.1 Introduction

The first IMSA development and validation study provided initial evidence for the stable psychometric properties of the measure in a sample of undergraduates and community-dwelling adults who had attempted suicide within the past three years. Individuals who have had more recent and more medically serious suicide attempts are another essential sample in which to validate the IMSA. Like any other event, memories of attempts are vulnerable to recall bias (Klimes-Dougan, Safer, Ronsaville, Tinsley, & Harris, 2007). The closer in time the assessment is to the actual attempt, the more likely the motivations reported will accurately reflect that motivations of the behavior. Suicide attempts also vary greatly in medical severity. Attempts that are severe enough to warrant inpatient hospitalization may be a better proxy for the outcome that is most important to prevent, suicide death (Beautrais, 2001; Hawton, 2002). Thus the focus of Study 2 was examining the psychometric properties of the IMSA, the pattern of motivation endorsement, and the relationship between attempt motivations and clinical correlates in a critical population, people who made potentially lethal suicide attempts in the very recent past.

3.2 Methods

3.2.1 Recruitment and Data Cleaning

Sixty participants with acute suicide attempts (within the past 14 days) were recruited from three inpatient psychiatric wards of a local hospital: a psychiatric emergency unit, a general psychiatric ward, and a ward specializing in substance abuse and psychiatric comorbidity. Patients admitted to one of the wards hospital due to a suicide attempt were approached and invited to participate in the study while on the unit. Potential participants answered screening

questions to determine whether their experience fit the study's definition of an attempt. A suicide attempt was defined as "self-inflicted, potentially injurious behavior with a nonfatal outcome for which there is evidence of intent to die" (Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007). Specifically, they were asked whether they had tried to hurt themselves with at least some intent to die. The attempt was then further assessed with a semi-structured interview (see measures below). Exclusion criteria included either language or cognitive barriers that prevented completion of the study protocol. Signed informed consent was obtained from all participants. Eligible participants completed questionnaires and a semi-structured interview. At the end of the session participants were debriefed as to the purpose of the research, positive coping strategies were highlighted as a reminder of healthy ways to manage distress, and current feelings of safety were assessed. The study was approved by the appropriate research ethics boards and was coordinated in consultation with the participants' treatment teams.

Missing data was analyzed. On the IMSA, if a scale was missing only one item, the mean of the four remaining items was used to calculate the scale mean. This occurred in 10 instances across 600 scale scores calculated. No participants skipped more than one item on any given scale. Data were also examined for outliers. One participant was excluded because she scored over 4 standard deviations above the sample mean on a scale. Thus 59 participants were included in the analyses.

3.2.2 Participants

Participants consisted of 59 Canadian adults admitted to psychiatric wards due to a suicide attempt.

The sample was predominantly female (66%), aged 19-75 (*Median* = 34, *IQR* = 23-46). Regarding ethnicity, the majority of the sample was Caucasian (53%). The remaining participants identified as of East Asian descent (20%), mixed descent (17%), or of other descents

(11%). Seventeen percent of the sample identified as part of a minority sexual orientation (i.e., bisexual, gay, lesbian, questioning). Most participants described themselves as either single (56%), divorced/separated (27%), or widowed (5%). Only 7% of the sample reported being married. Almost half of the sample reported they were working outside of the home (46%).

Current diagnoses were abstracted from the participants' medical charts. Most participants had more than one diagnosis (63%) and most participants with only one confirmed diagnosis had at least one other disorder listed as a query or rule out. Of the confirmed diagnoses, mood disorders were the most common, identified in 78% of participants. A Cluster B personality disorder was diagnosed in 28% of participants. Anxiety disorders were diagnosed in 20% of participants. Only 15% were diagnosed with a substance use disorder, 9% with a thought disorder and 4% with an eating disorder.

Regarding history of suicidality, participants reported onset of suicide ideation in the mid-teens (*Median* = 16, *IQR* = 14-24) and a median of 2 lifetime suicide attempts (*IQR* = 1-4). The most common methods used in the most recent attempt were overdose/poisoning (70%), cutting/stabbing (8%), hanging (10%), stepping into traffic/rail tracks (5%), jumping (3%), drowning (2%) and other (2%). The attempt assessed occurred a median of 3 days before the study appointment (*IQR* = 2-5). All participants originally presented to the emergency department and were either directly admitted to psychiatric wards or were admitted to psychiatric wards after medical stabilization in the ICU or another medical unit.

3.2.3 Measures

3.2.3.1 Demographics and suicide history.

A standard demographics form collected information about sex, age, race/ethnicity, sexual orientation, marital status, and employment status. Items adapted from the Self Injurious

Thoughts and Behaviors Inventory (SITBI; Nock, Holmberg, Photos, & Michel, 2007) assessed age at first ideation.

3.2.3.2 Attempt motivations.

The primary measure of interest, the Inventory of Motivations for Suicide Attempts (IMSA; May & Klonsky, 2013) was described extensively above. The RASQ is a 14-item self-report measure with a 7-point Likert scale that assesses 2 superordinate dimensions: the Internal Perturbation-Based Reasons Scale and the Extrapunitive/Manipulative Motivations Scale. The RASQ (Holden et al., 1998; Johns & Holden, 1997) was used evaluate the construct validity of the IMSA. On the RASQ data was imputed if a scale was missing no more than 1 item. Twenty-five participants were either not administered the RASQ or skipped more than one item. Thus, only 34 participants are included in analyses using the RASQ.

3.2.3.3 Attempt characteristics.

Details of the most recent attempt were assessed with the Suicide Attempt and Self Injury Interview (SASII; Linehan et al, 2006) and the Suicide Intent Interview (SIS; Beck et al., 1974). The SASII is a semi-structured interview designed to assess the frequency, method, severity, context, intent, reasons, and outcomes of self-injurious behaviors. It consists of open-ended, forced choice, yes/no, and Likert rated questions. The validity of SASII items has been established by comparing interview reports with therapist note, medical records, and coding by expert raters (Linehan et al., 2006). This interview was used to assess the details of the most recent suicide attempt. Episodes of non-suicidal self-injury were not assessed. Each item included in our analyses is described in more detail below.

The attempt method was coded from open-ended and follow up questions on the SASII that inquired about the nature and methods of the attempt.

Intent to die was assessed two ways. First, the SASII includes an item that asks the participant to endorse a description of their intent directly before the attempt ranging from 0 (“Not at all”) to 6 (“I was extremely serious, intended to die, and was not ambivalent/unsure at all”). This item is referred to as intent (self-endorsed). Second, the SIS, a 15-item interviewer coded measure of suicide attempt intent, was scored. SIS items are scored 0-2 and then summed, with higher scores reflecting greater intent. The SIS has been shown to have good internal reliability and concurrent validity (Ojehagen, Regnell, & Traskman-Bendz, 1991; Power, Cooke, & Brooks, 1985). The SIS total score is referred to as intent (interviewer-rated).

The pre-attempt communication variable is a composite of two SASII items. One assesses direct, indirect, or no mention of suicide before the attempt. The second item assesses direct, indirect, or no threats of suicide before the attempt. The items were combined and dichotomized into any or no pre-attempt communication.

Probability of intervention was assessed in two ways. First, a SASII item asked “Did you arrange your attempt in such a way that it would be difficult for anyone to find, stop, or save you?” Response options were no, somewhat, and yes. The item was coded such that higher scores reflect a greater likelihood of intervention. This item is referred to as probability of intervention (self-endorsed). Second, SASII interviewers were asked to code the likelihood of intervention on the attempt based on all the information gathered through open-ended and follow up questions. Response options ranged from 1 (“Chance of intervention remote”) to 5 (“Certain intervention”). This item is referred to as probability of intervention (interviewer-rated).

Medical risk of death was coded based on information gathered during the interview. Response options ranged from 1 (“Very low”) to 6 (“Severe”). Each option included specific examples such as the number of pills taken, the type of wound inflicted, or the height from which a jump

took place. Lethality was assessed with a SASII item that asks “What was your physical condition after your most recent suicide attempt?” and offers 7 options from 0 (“My physical condition was not affected”) to 6 (“My physical condition was extremely severely affected (e.g., cardiac arrest; systemic organ failure; gun shot in chest or head)”). Examples are provided with each response option.

3.3 Results

3.3.1 A Note on Language

Correlations between .10-.19 are referred to as weak, .20-.29 as small/modest, .30-.49 as medium/moderate, and .50 and above as large/strong.

3.3.2 Descriptive and Internal Consistency Statistics of the IMSA

Means, standard deviations, and coefficient alphas of the 10 IMSA scales were calculated (Table 7). As in the initial sample, Hopelessness, Psychache, and Escape had the highest mean endorsement and Interpersonal Influence, Help-Seeking, and Impulsivity had the lowest. Two scales were rated at least “important” by over 90% of the sample, Hopelessness by 95% of participants and Psychache by 95%.

Scale coefficient alpha’s ranged from .69 to .91. Problem-Solving, a scale that was excluded from factor analyses in the initial samples due to a low alpha, performed slightly better in this sample. However it still displayed the lowest internal consistency, .69 (the remaining nine scales had alphas ranging from .73 to .91). Given the scale’s historical inconsistency and its borderline alpha in this sample, we again decided to not to retain the Problem-Solving scale (although we did leave the individual items in the measure for further investigation and for their potential clinical value). Correlations among the scales were examined (Table 8). Relationships were generally weak to moderate. Interpersonal Influence and Help-Seeking were the most

highly correlated ($r = .71$). The scales were sufficiently distinct to be used individually.

3.3.3 Factor Structure

Exploratory factor analysis of the IMSA was conducted with principal axis factoring and promax rotation. Promax rotation was used as there was no reason to believe the factors would be orthogonal. Nine scales were entered into the factor analysis. Bartlett's test of sphericity was significant, indicating there was sufficient collinearity to proceed with a factor analysis. The KMO statistics, which describes the degree of diffusion in the pattern of correlations, suggests good sampling adequacy (.79).

Examination of eigenvalues and scree plots revealed a 2-factor structure (Table 9). The first factor (accounting for 43% of the variance; eigenvalue = 3.8) was consistent with the Internal factor identified in the original factor analysis of the IMSA (May & Klonsky, 2013).

The following six scales loaded cleanly (loadings of .40 or greater) on to this factor:

Hopelessness, Psychache, Escape, Burdensomeness, Low Belongingness, and Fearlessness. The second factor (accounting for 18% of the variance; eigenvalue = 1.6) was consistent with the Communication factor identified previously, with the addition of the Impulsivity scale. The following scales loaded cleanly on to the second factor: Interpersonal Influence, Help-Seeking, and Impulsivity.

The scales belonging to each of the two factors were summed to form an Internal Motivations factor and a Communication Motivations factor. Coefficient alpha for the Internal Motivations factor was .82 and for the Communication Motivations factor was .72. The Internal Motivations and Communication Motivations factors were moderately correlated with each other ($r = .38$). The initial Communication Motivations factor (not including the Impulsivity scale) was also calculated and included in analyses for ease of comparison with the initial sample. It also had a moderate relationship with the Internal Motivations factor ($r = .35$).

3.3.4 Convergent and Divergent Validity

Next we examined the convergent and divergent validity of the IMSA by inspecting the associations between each of the IMSA factors and another measure of attempt motivations, the RASQ (Table 10). The means, standard deviations, and reliability coefficients of the RASQ are reported in Table 11. The RASQ Internal Perturbation-based reasons scale did not function as expected. The coefficient alpha for the scale was .00, reflecting a negative average covariance among the items. No one item appeared to be behaving abnormally, as there were negative and low correlations throughout many items on the scale. The entire measure also did not appear to be behaving abnormally, as the coefficient alpha for the other scale, Extrapunitive/Manipulative reasons, was .85. Thus the RASQ Internal Perturbation-based reasons scale was not used.

The Extrapunitive/Manipulative reasons are similar to the IMSA Communication Motivations factor in that they both assess attempt motivations that involve people or institutions outside of the attempter. As expected, there was a strong association between the conceptually related scales ($r = .56$) and a weak relationship between the dissimilar scales ($r = .10$). These correlations support the IMSA's convergent and divergent validity.

3.3.5 Clinical Correlates

Finally, we conducted exploratory correlational analyses to examine how IMSA motivations relate to characteristics of the suicide attempt. Descriptive statistics for the attempt characteristics are provided in Table 11 and correlations are provided in Table 12. The IMSA Communication Motivations factor was moderately related to less suicidal intent, as coded by the interviewer ($r = -.32$) and weakly to modestly related to a greater probability of intervention (r 's = .18 and .27). There was no relationship between the Communication Motivations factor and self-endorsed intent, pre-attempt communication, riskiness of attempt method, or lethality. The Internal Motivations factor was modestly to moderately associated with greater intent (r 's = .23

and .35), modestly associated with using riskier methods ($r = .25$) and having a lower likelihood of intervention ($r = -.24$), and weakly related to greater lethality ($r = .10$). There was no relationship between the Internal Motivations factor and pre-attempt communication or self-endorsed probability of intervention.

In addition, the IMSA includes a single item that evaluates “wanting to die” as an attempt motivation. Virtually all participants (91%) endorsed this item to some degree, though there was variation regarding how important this motivation was perceived to be. This item was moderately related to greater Internal Motivations ($r = .40$) and weakly related to lower Communication Motivations ($r = -.13$).

Finally, the correlations with the original Communication Motivations factor (which did not include the Impulsivity scale) were examined. Overall, the strength of the correlations (weak, small, medium, or large) was generally consistent with those generated by the Communication Motivations factor as constructed in this sample (including the Impulsivity scale). There were no statistically significant differences between the correlations (Z 's range from 0.18 to 1.77, p 's range from .08 - .86).

4 Study 3: Psychometrics and Correlates of the IMSA in Online Respondents with a Lifetime History of Attempt

4.1 Introduction

The IMSA development and validation study provided initial evidence for the stable psychometric properties of the measure. Study 2 found similar results among acute, severe suicide attempt survivors. These two studies described the endorsement and correlates of suicide attempt motivations in relatively small samples of predominantly female participants living in the metro Vancouver area. To further assess 1) the stability of the psychometric properties of the measure, 2) prevalence of each motivation and 3) how the motivations for suicide attempts relate to other characteristics of attempts, it is important to assess the measure in a more diverse population. The following study was undertaken to address three limitations of the original studies: 1) to recruit a larger sample, 2) to increase the diversity (e.g., sex, geographic location, ethnicity) of the sample, and 3) to assess whether the functioning of the IMSA differed when reporting on a more remote suicide attempt. Online data collection can be an effective way to gather data from a diverse sample experiencing a rather rare event, such as a suicide attempt, and was thus employed in Study 3. Similar procedures and methods were applied in this study as to the earlier studies with the following exception. In Study 3 data were collected in an online self-report format, rather than by a combination of in-person self-report and interview measures.

4.2 Methods

4.2.1 Recruitment and Data Cleaning

The study was advertised on Mechanical Turk, a crowdsourcing Internet marketplace in which participants see descriptions of tasks they may complete, estimated time required, and compensation amounts. The study was advertised to members of MTurk who reported they

resided in the United States and had demonstrated consistent and accurate responding on previous MTurk tasks. The study consisted of a screening questionnaire and a full battery of questionnaires, both completed online. All participants filled out a screening questionnaire that included questions about suicide ideation and attempt history embedded among other questions about entertainment preferences, sleep quality, and mental health. The screening questionnaire was completed by 3,125 people. For the purposes of this study, any participant who endorsed a lifetime history of a suicide attempt was invited to complete the full set of questionnaires in return for further compensation. The full survey included the measures described below, as well as three validity questions to ensure participants were attending to the questions appropriately.

Participants who failed to answer the validity questions correctly, demonstrated inconsistent responding, or described behaviors inconsistent with the study's definition of a suicide attempt were excluded. If a participant completed the survey more than once, only the data from his or her first survey administration was used. Three participants were removed for reporting a suicide attempt during the screening, but reporting zero attempts when more details were requested.

Six participants skipped more than one item on any given IMSA scale and were not included in the analyses. If an IMSA scale was missing only one item, the mean of the remaining four items was used to calculate the scale mean. This occurred in 12 instances across the 2220 scales calculated. Thus 222 participants had full data for all 10 scales and were included in the factor analysis. IMSA data were also examined for outliers, defined as a scoring 4 or more standard deviations above scale mean, of which there were none.

4.2.2 Participants

Participants consisted of 222 American adults reporting a history of at least one suicide attempt and completing the IMSA.

The sample was predominantly female (56%) and aged 18-63 (*Median* = 28, *IQR* = 24-34). Regarding ethnicity the sample was predominantly Caucasian (73%). The remaining participants were of multiple ethnicities (10%), African American (6%), Asian American (5%), Latino/a-Hispanic (3%) and other (3%). Thirty three percent of the sample identified as part of a minority sexual orientation (i.e., bisexual, gay, lesbian, questioning). Most participants described themselves as single (54%), married/common law (35%), or divorced/separated (7%). Regarding education, 15% of the sample report their highest level was a high school diploma or less, 47% reported some college, 28% reported attaining a college degree, and 9% reported graduate or professional education. Almost half of the sample reported they were working outside of the home (49%). The sample was drawn from diverse regions of the United States: Southeast (21%), Great Lakes (17%), Mid-Atlantic (17%), Far West (16%), Southwest (14%), New England (6%), Plains (5%), and Rocky Mountains (5%). Most participants reported living in the suburbs (50%), while others lived in urban (31%) or rural (19%) areas.

Regarding history of suicidality, participants reported onset of suicide ideation in the early teens (*Median* = 13, *IQR* = 12-16) and a median of 1 lifetime suicide attempt (*IQR* = 1-2). The most common methods used in the most recent attempt were overdose/poisoning (61%), cutting/stabbing (19%), hanging (8%), other method (6%), gun (2%), carbon monoxide poisoning (2%), and automobile crash (2%). The attempt assessed occurred a median of 5 years earlier (*IQR* = 2-11).² Following the most recent attempt, 49% of participants reported requiring medical attention.

² Due to a technical error, the age at most recent attempt was only collected for 77% of the sample.

4.2.3 Measures

4.2.3.1 Demographic and suicide history.

A standard demographics form collected information about sex, age, race/ethnicity, sexual orientation, marital status, education level, employment, and geographic region. Items adapted from the Self Injurious Thoughts and Behaviors Inventory (SITBI; Nock, Holmberg, Photos, & Michel, 2007) assessed age at first ideation.

4.2.3.2 Suicide attempt screening.

An item from the Youth Risk Behavior Surveillance Survey (YRBS; CDC, 2009) was used to assess a lifetime history of suicide attempt in the screening questionnaire. This question has good to excellent reliability and validity (Brenner et al., 2002; May & Klonsky, 2011). Only participants endorsing this item were invited to complete the full questionnaire. In the full questionnaire, another item, based on Silverman et al.'s (2007) definition of a suicide attempt, asked participants to report the number of lifetime attempts ("A suicide attempt is defined as causing injury to yourself with at least some intent to die. How many times have you made an actual suicide attempt in which you had at least some intent to die?"). Only participants reporting one or more attempts on this item were included in these analyses.

4.2.3.3 Attempt motivations.

The primary measure of interest, the Inventory of Motivations for Suicide Attempts (IMSA; May & Klonsky, 2013) was described extensively above. It consists of 10 5-item scales, as well as 4 additional items. Items are rated on 5-point Likert scales ranging from 0 (not at all important) to 4 (most important).

The RASQ (Holden et al., 1998; Johns & Holden, 1997) was used to assess reasons for suicide attempts and help evaluate the construct validity of the IMSA. The RASQ is a 14-item measure with a 7-point Likert scale that assesses two superordinate dimensions: the Internal

Perturbation-Based Reasons Scale and the Extrapunitive/Manipulative Motivations Scale. On the RASQ, data were imputed if a scale was missing no more than 1 item (scales had either 6 or 8 items total). This occurred in 7 instances across the 440 scales calculated. Four participants skipped more than 1 item per scale and were not included in analyses involving the RASQ.

4.2.3.4 Attempt characteristics.

Details of the most recent attempt were assessed with items derived from the Suicide Attempt and Self Injury Interview (SASII; Linehan et al, 2006). This measure assesses important details of the most recent attempt such as method, pre-attempt communication, likelihood of intervention, and lethality of injuries. Interview items were transformed to a self-report version to maintain as much consistency as possible the SASII interview administered in the outpatient, undergraduate, and hospital populations.

The item assessing method presented 14 suicide attempt methods, including an open-ended “other” option. The item assessing intent asked about intent directly before the attempt ranging from 0 (“Not at all”) to 6 (“I was extremely serious, intended to die, and was not ambivalent/unsure at all”). The pre-attempt communication variable is a composite of two SASII items. One assesses direct, indirect, or no mention of suicide before the attempt. The second item assesses direct, indirect, or no threats of suicide before the attempt. The items were combined and dichotomized into any or no pre-attempt communication. Probability of intervention was assessed with a SASII item that asks “Did you arrange your attempt in such a way that it would be difficult for anyone to find, stop, or save you?” with the response options, no, somewhat, and yes. The item was coded such that higher scores reflect a greater likelihood of intervention. Lethality was assessed with a SASII item that asks “What was your physical condition after your most recent suicide attempt?” and offers 7 options from 0 (“My physical

condition was not affected”) to 6 (“My physical condition was extremely severely affected (e.g., cardiac arrest; systemic organ failure; gun shot in chest or head”). Examples were provided with each response option.

4.3 Results

4.3.1 A Note on Language

Correlations between .10-.19 are referred to as weak, .20-.29 as small/modest, .30-.49 as medium/moderate, and .50 and above as large/strong.

4.3.2 Descriptive and Internal Consistency Statistics of the IMSA

Means, standard deviations, and coefficient alphas of the ten IMSA scales were calculated (Table 13). The mean endorsement levels of the scales followed a similar pattern to the original sample, with Hopelessness, Psychache, and Escape garnering the highest mean endorsements and Interpersonal Influence having the lowest endorsement. Two scales were rated at least “important” by over 90% of the sample, Hopelessness by 96% of participants and Psychache by 91%. Almost the full range of each scale was utilized, suggesting that each reason is an important motivation for at least some suicide attempts.

Scale coefficient alpha’s ranged from .70 to .91. Problem-Solving, a scale that was excluded from factor analyses in previous samples due to a low alpha, performed better in this sample. However it still displayed the lowest consistency (the remaining 9 scales ranged from .78 to .91). Given the scales’ historical inconsistency and its relatively low alpha in this sample, we again decided to not to retain the Problem-Solving scale. Correlations among the scales were examined (Table 14). Relationships were generally weak to moderate. Interpersonal Influence and Help-Seeking were the most highly correlated ($r = .77$). The scales were sufficiently distinct to be used individually.

4.3.3 Factor Structure

Exploratory factor analysis of the IMSA was conducted with principal axis factoring and promax rotation. Promax rotation was chosen as there was no reason to believe the factors would be orthogonal. Nine scales were entered into the factor analysis. Bartlett's test of sphericity was significant, indicating there was sufficient collinearity to proceed with a factor analysis. The KMO statistics, which describes the degree of diffusion in the pattern of correlations, suggests good sampling adequacy (.78).

Examination of eigenvalues and scree plots revealed a 2-factor structure (Table 15). The first factor (accounting for 39% of the variance; eigenvalue = 3.5) was generally consistent with the Internal Motivations factor identified in the original factor analysis of the IMSA (May & Klonsky, 2013). The following five scales loaded cleanly (loadings of .40 or greater) on to this factor: Hopelessness, Psychache, Escape, Burdensomeness, and Fearlessness. The second factor (accounting for 21% of the variance; eigenvalue = 1.9) was generally consistent with the Communication Motivations factor identified previously. The following scales loaded cleanly on to the second factor: Interpersonal Influence, Help-Seeking, and Impulsivity. Contrary to the factor solution in the original sample, in this sample, the Low Belongingness scale was spilt with low loadings on both factors and thus was not included in either factor.

The scales belonging to each of the two factors were summed to form an Internal Motivations factor (Hopelessness, Psychache, Escape, Burdensomeness, and Fearlessness) and a Communication Motivations factor (Interpersonal Influence, Help-Seeking, and Impulsivity). The coefficient alpha for the Internal Motivations factor was .77 and for the Communication Motivations factor was .81. The Internal Motivations and Communication Motivations factors were modestly correlated with each other ($r = .29$). For the purposes of comparison with the

samples reported earlier, a version of the Communication Motivations factor not including the Impulsivity scale is also included in the tables and in subsequent analyses.

4.3.4 Convergent and Divergent Validity

Next we examined the convergent and divergent validity of the IMSA by inspecting the associations between each of the IMSA factors and another measure of attempt motivations, the RASQ (Table 16). The means, standard deviations, and reliability coefficients of the RASQ are reported in Table 17. The reliability of the RASQ Internal Perturbation-based reasons scale was low, but acceptable. The RASQ Internal Perturbation-based reasons are conceptually similar to the IMSA Internal Motivations factor in that they both assess attempt motivations related to psychological pain, while the Extrapunitive/Manipulative reasons are similar to the IMSA Communication Motivations factor in that they both assess attempt motivations that involve people or institutions outside of the attempter. As expected, the largest associations were between the conceptually related scales and the strength of each of these relationships was strong (r 's = .59 and .81). These correlations support the IMSA's convergent validity. Also as expected the relationships between the conceptually dissimilar scales were much smaller (r 's = .26 and .35), supporting divergent validity. The correlation between the IMSA Internal Motivations factor and each of the RASQ scales was significantly different ($Z = 4.9, p < .001$). Similarly, correlation between the IMSA Communication Motivations factor and each of the RASQ scales was also significantly different ($Z = 8.6, p < .001$). However it is noteworthy that the correlations between the dissimilar scales, particularly between the IMSA Communication Motivation factor and the RASQ Internal Perturbation scale are higher than was observed in the original IMSA sample.

4.3.5 Clinical Correlates

Finally, the relationship between IMSA motivations and characteristics of the suicide attempt were assessed. Descriptive statistics for the attempt characteristics are provided in Table 17 and correlation are provided in Table 18. The Communication Motivations factor modestly related to less intent ($r = -.25$) and a moderately related to more pre-attempt communication ($r = .36$). Weak correlations were observed between the Communication Motivations factor and the increased probability of the intervention ($r = .14$) and decreased lethality ($r = -.14$). The Internal Motivations factor was weakly correlated with more intent and pre-attempt communication (r 's = .14) and lower probability of intervention ($r = -.12$).

The IMSA includes an item that is not scored on any scale and that evaluates “wanting to die” as a motivation. Virtually all participants (95%) endorsed this item to some degree, but the extent to which participants reported this an important motivation varied. This item was moderately related to greater Internal Motivations ($r = .39$) and weakly related to less Communication Motivations ($r = -.12$).

Finally, correlations with the original Communication Motivation factor (which did not include the Impulsivity scale) were examined. Overall, the strength of the correlations (weak, small, medium or large) was consistent with those generated by the Communication Motivations factor as constructed in this sample (i.e., including the Impulsivity scale). The only notable difference was that the inverse relationship between intent and the Communication Motivations factor was significantly stronger when the Impulsivity scale was included on the factor ($Z = 3.1$, $p < .01$).

5 Study 4: Psychometrics and Correlates of the IMSA in Adolescent Inpatient Suicide Attempters

Note: This chapter is heavily based on a manuscript currently in press at *Archives of Suicide Research*, Descriptive and Psychometric Properties of the Inventory of Motivations for Suicide Attempts (IMSA) in an Inpatient Adolescent Sample (May, O'Brien, Liu & Klonsky).

5.1 Introduction

Studies 1 through 3 examined the psychometrics properties of the IMSA in four distinct populations of adult attempters: undergraduates, outpatients, inpatients, and an online community sample. Adolescents represent yet another important population in which to understand suicidality. Though adolescents represent a minority of the total number of suicide deaths, suicide is the second leading cause of death for people aged 15-24 and the third leading cause of death for people 10-14 (CDC, 2015b). Furthermore, the large majority of people who experience suicidality during their lifetime report the first onset occurs during their teenage and young adult years (Borges et al., 2012). Thus, understanding and preventing suicide attempts during adolescence may not only help to reduce teen suicide death, but could potentially reduce suicide attempts later in life if early suicidal behavior was thwarted.

Despite increased prevention and intervention efforts over the past 30 years, suicide continues to be a pervasive public health problem for adolescents. The most recent results from the Youth Risk Behavior Surveillance Survey found that 16% of students reported seriously considering suicide, 13% reported having made a plan to kill themselves, and 8% reported trying to kill themselves within the past year (Kann et al., 2014).

Similar to adults, although our knowledge of common risk factors associated with adolescent suicide attempts is rich, research on *why* adolescents attempt suicide is sparse.

Hawton, Cole, O'Grady, and Osborn (1982) found that teens endorsed escape, relief from a terrible state of mind, and communicating emotions as the most common reasons for their self-injurious behavior. The least common reason reported was to seek help. Two more recent papers both found that items reflecting escaping a situation, a state of mind, and painful feelings were the most widely endorsed, while communicating with others and reaching out for help were least endorsed (Boergers, Spirito, & Donaldson, 1998; Kienhorst, De Wilde, Diekstra et al., 1995).

In addition to being scarce, research on motivations for suicide attempts has been limited by some of the same methodological concerns that plague the adult literature. First is the absence of a single, comprehensive measure with which to assess motivations. For example, the studies mentioned above use either 8 items (Boergers et al., 1998; Hawton et al., 1982) or 14 items (Kienhorst et al., 1995) chosen from a longer list of overdose reasons generated by patients in the 1970's (Bancroft et al., 1976; Bancroft et al., 1979.) Additionally, depending on the study response options varied; participants endorsed each item as present/absent, of primary importance, or along a 7-point Likert scale.

Second, none of the three studies described above included intent to die as part of the definition of attempt and 24%-44% of each sample did not endorse wanting to die as a possible reason for their self-injurious behavior (Boergers et al., 1998; Hawton, et al., 1982; Kienhorst et al., 1995). Thus, findings from these studies may be confounded by the motivations reported for non-suicidal self-injurious behaviors. There is growing recognition of the distinction between self-injurious behavior with intent to die (i.e., suicide attempts) and self-injurious behavior without intent (i.e., non-suicidal self-injury) (Muehlenkamp & Kerr, 2010). Studies suggest these behaviors may have different (and at times divergent) motivations (Klonsky & Glenn, 2009; Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2011). Thus an important next step is to

identify the motivations for attempt in a sample in which all participants report at least some degree of intent to die.

Hawton et al.'s (1982) study illustrates an essential reason for developing and using measures of motivations for attempts. In his study, clinicians were asked to complete the same questionnaires as their adolescent clients. Adolescents and clinicians agreed minimally about the adolescents' reasons for attempting. Specifically, clinicians were likely to underestimate intent to die and over estimate the communicative or interpersonal motivations for the attempt, compared to the adolescents' self-report.

The first goal of the present study is to describe the motivations adolescents endorse for their suicide attempts. The second goal is to establish the structure of the IMSA scales in adolescents using exploratory factor analysis. The third goal is to explore the relationship between motivations and clinical characteristics of the attempt (i.e., intent, lethality).

5.2 Methods

5.2.1 Recruitment

Data for the current study were drawn from two ongoing clinical trials with suicidal adolescents admitted to two psychiatric inpatient units in the Northeastern area of the United States. Legal guardians provided informed consent and adolescent participants gave their informed assent. As part of the larger study, participants completed an interview assessing recent and lifetime suicide attempts. Those who reported a history of suicide attempts were then administered a self-report measure of motivations for their most recent attempt. At 6- and 12-month follow-ups, participants were also administered the suicide attempt interview to assess for the occurrence of new attempts since the last assessment. Where relevant, participants were then

administered the self-report measure of attempt motivations for their most recent suicide attempt in the prospective phase of the study.

5.2.2 Participants

Participants included 52 adolescent psychiatric inpatients who attempted suicide. An attempt is defined as “self-inflicted, potentially injurious behavior with a nonfatal outcome for which there is evidence (either explicit or implicit) of intent to die” (Silverman, Berman, Sanddal et al., 2007, p. 273). Participants were primarily female (85%) and ranged from 12-17 years of age with a mean of 14.8 ($SD = 1.4$). Regarding race and ethnicity, 65% identified as White, 14% as Hispanic or Latino/a, 14% as multiracial, 4% African American and 4% declined to answer. Onset of suicide ideation occurred at mean age 12.0 ($SD = 2.3$). Most reported only one suicide attempt (67%), though 21% reported 2-3 lifetime attempts, and 12% reported 4 or more. The methods of attempt were overdose (56%), cutting/stabbing (17%), hanging (10%), suffocation (5%), drowning (5%), and other (7%). The majority (88%) participated while on the inpatient ward, the remaining 12% participated during a 6- or 12-month follow-up visit and reported on an attempt occurring in the intervening months. Participants were assessed a median of 3 weeks after their most recent suicide attempt ($IQR = 1-18$ weeks).

5.2.3 Data Preparation

Data were examined for outliers and missing values. On the IMSA, if a scale was missing only one item, the mean of the four remaining items was used to calculate the scale mean. This occurred in six instances across 520 scale scores calculated. If participants skipped more than one item on any given scale, their data were not used. This occurred in one instance across 520 scale scores. Data were also examined for outliers. One participant was excluded because she scored over 4 standard deviations above the sample mean on a scale. Thus 50 participants were included in the analyses.

5.2.4 Measures

The primary measure of interest, the Inventory of Motivations for Suicide Attempts (IMSA; May & Klonsky, 2013) was described extensively above. It consists of 10 5-item scales, as well as 4 additional items. Items are rated on 5-point Likert scales ranging from 0 (not at all important) to 4 (most important).

One of the four additional items (“I attempted suicide because I wanted to die”) was used to index level of intent. Though virtually all of the participants endorsed this item to some degree (98%), the strength with which they identified wanting to die as a motivation for their attempt varied.

The Columbia-Suicide Severity Rating Scale (C-SSRS; Posner, Brown, Stanley et al., 2011) was the structured interview used to assess for the occurrence of suicide attempts, as well as specific characteristics of the most recent attempt. Participants were asked to provide the date of the index attempt, as well as details regarding the means for the attempt (e.g., type and quantity of pills). Participants were also asked for details regarding the severity of physical damage that resulted from the suicide attempt. The severity of physical damage was then rated on an ordinal scale ranging from 0 (“no physical damage or very minor damage”) to 5 (“death”). The C-SSRS has been found to have good reliability and validity among adolescent suicide attempters (Posner et al., 2011).

5.3 Results

5.3.1 A Note on Language

Correlations between .10-.19 are referred to as weak, .20-.29 as small/modest, .30-.49 as medium/moderate, and .50 and above as large/strong.

5.3.2 Descriptive Statistics and Internal Consistency

Mean endorsement and internal consistency are reported for each of the ten scales (Table 19). Psychache, Hopelessness, and Escape were the three most strongly endorsed motivations, while Interpersonal Influence was the least endorsed. Examining scale means demonstrated that three scales were rated as at least an “important” attempt motivation by almost all of the participants: Hopelessness (98%), Psychache (90%), and Escape (90%). Nine of the ten scales had coefficient alphas of .74 or greater. Problem-Solving was the exception ($\alpha = .65$), indicating that the items on this scale did not correlate strongly with each other. This is consistent with the poor functioning of the scale in other samples. Thus, this scale was dropped from the subsequent factor analysis. Correlations among the scales were examined (Table 20). Relationships were generally weak to moderate. Hopelessness and Escape were the most highly correlated ($r = .75$). The scales were sufficiently distinct to be used individually.

5.3.3 Factor Structure

Exploratory factor analysis of the IMSA was conducted with principal axis factoring and promax rotation. Promax rotation was used as there was no reason to believe the factors would be orthogonal. Nine scales were entered into the factor analysis. Bartlett’s test of sphericity was significant, indicating there was sufficient collinearity to proceed with a factor analysis. The KMO statistics, which describes the degree of diffusion in the pattern of correlations, suggests good sampling adequacy (.81).

Examination of eigenvalues and scree plots revealed a 2-factor structure (Table 21). The first factor (accounting for 46% of the variance; eigenvalue = 4.1) was consistent with the Internal Motivations factor identified in the initial sample. The following six scales loaded cleanly (factor loadings of .40 or greater) on to this factor: Hopelessness, Psychache, Escape, Burdensomeness, Low Belongingness, and Fearlessness. The second factor (accounting for 18%

of the variance; eigenvalue = 1.6) was consistent with the Communication Motivations factor identified previously. The following scales loaded cleanly on to the second factor: Interpersonal Influence and Help-Seeking. As the Impulsivity scale did not load strongly on either factor, it was retained as an independent scale.

The scales belonging to each of the two factors were summed to form an Internal Motivations factor and a Communication Motivations factor. Coefficient alpha for the Internal factor was .89 and the Spearman-Brown reliability coefficient for the Communication factor was .69. The Internal Motivations and Communication Motivations factors were not correlated with each other ($r = .07$), supporting the distinct identity of each factor.

5.3.4 Attempt Characteristics

Exploratory analyses were conducted to investigate relationships between the Internal and Communication factors and two characteristics of the suicide attempt, intent and lethality (Tables 22 and 23). Suicidal intent, as indexed by the IMSA item “I attempted suicide because I wanted to die,” was strongly correlated with Internal Motivations ($r = .67$) and weakly inversely correlated with Communication Motivations ($r = -.19$). The lethality of the attempt was weakly correlated with stronger endorsement of both Internal ($r = .20$) and Communication ($r = .11$) Motivations. Given the restricted range of lethality represented in this sample, the associations with lethality should be interpreted with caution.

6 Additional Analyses Comparing Results Between and Across Samples

6.1 Introduction

In order to further explore similarities and differences across the samples, three additional sets of analyses were conducted. First, means for the nine IMSA scales were compared across samples to determine whether endorsement of attempt motivations differed between the five samples. Second, in order to better understand the relationship between attempt motivations and the outcome of attempts, the relationship between participants' desire to die and the actual lethality of their attempts was calculated. Third, the samples were combined so that mean endorsement patterns and factor structure could be examined separately for males and females. Suicidal thoughts and behaviors are known to differ by sex. For example, women are at greater risk of thinking about and attempting suicide, while men are at a greater risk of dying by suicide (CDC, 2014; Nock et al., 2012) The combined sample resulted in a sample of males large enough that they could be compared to females.

6.2 Comparing Mean Endorsement Between Samples

Mean endorsements of the nine IMSA scales were compared across samples (Table 24). Homogeneity of variance was examined with the Levene statistic. The Welch F -ratio is reported when assumptions of homogeneity of variance were violated. When there was a significant difference among the means, post-hoc analyses were conducted. For scales in which assumptions of homogeneity of variance were violated, the Games-Howell post hoc tests was used, where local homogeneity could be assumed, Hochberg's GT2 post hoc test was used to account for the varying sample sizes.

There were no statistically significant differences in the mean endorsement of Hopelessness, Psychache, Escape, Burdensomeness, Low Belongingness, Impulsivity, or Help-Seeking across the five samples. Two scales varied by sample. First, there was a significant effect of sample on mean endorsement of Fearlessness, $F(4, 446) = 2.67, p = .032$. Post hoc analyses revealed that adult inpatients reported greater fearlessness motivations than the online sample ($p = .021, d = .45$) and the undergraduate participants ($p = .055, d = .53$), though confidence in the validity of the difference is lower in the undergraduate comparison due to a smaller sample size. Second, there was a significant effect of sample on mean endorsement of Interpersonal Influence, $F(4, 151.0) = 5.68, p < .000$. Post hoc analyses revealed that adolescent inpatient participants reported lower interpersonal attempt motivations than undergraduates ($p = .002, d = .67$), outpatients ($p = .047, d = .58$), and the online sample ($p = .003, d = .45$).

6.3 Relationship between Desire to Die and Lethality of Attempt

In order to better understand the relationship between attempt motivations, desire to die, and attempt lethality, the relationship between desire for death and lethality was examined for each sample (Table 25). Results showed a consistently small and generally non-significant relationship between desire for death and attempt lethality (range: $r = .10-.19$).

6.4 Comparing Mean Endorsements and Factor Structure Between Sexes in the Combined Sample

The five samples were combined and mean endorsement of the nine scales was compared between males and females (Table 26). Homogeneity of variance was examined with the Levene statistic. The Welch F -ratio is reported when assumptions of homogeneity of variance were violated. There were no statistically significant differences in the mean endorsement of

Hopelessness, Burdensomeness, Low Belongingness, Fearlessness, Impulsivity, Interpersonal Influence or Help-Seeking between males and females. Two scales varied by sex. Females reported significantly more Psychache ($F(1, 300.1) = 26.06, p < .001, d = .51$) and Escape ($F(1, 448) = 12.35, p < .001, d = .34$) motivations compared to males.

Exploratory factor analysis with principal axis factoring and promax rotation was conducted separately for males and females. Bartlett's test of sphericity was significant in both groups, indicating there was sufficient collinearity to proceed with the factor analyses. The KMO statistics suggested good sampling adequacy ($KMO_{\text{males}} = .80; KMO_{\text{females}} = .77$).

Examination of eigenvalues and scree plots revealed identical 2-factor structures for both males and females (Table 27). The first factor ($\text{eigenvalue}_{\text{male}} = 3.3; \text{eigenvalue}_{\text{female}} = 2.7$) was consistent with the Internal Motivations factor and included the following six scales (with factor loadings of .40 or greater): Hopelessness, Psychache, Escape, Burdensomeness, Low Belongingness, and Fearlessness. The second factor ($\text{eigenvalue}_{\text{male}} = 1.3; \text{eigenvalue}_{\text{female}} = 1.4$) included the following scales: Impulsivity, Interpersonal Influence, and Help-Seeking.

The scales belonging to each of the two factors were summed to form an Internal Motivations factor and a Communication Motivations factor. For both factors, both males and females had similar and adequate internal reliabilities (α 's = .73-.76). The Internal Motivations and Communication Motivations factors were modestly correlated with each other ($r_{\text{male}} = .34; r_{\text{female}} = .29$).

7 Discussion

The goal of this dissertation was to better understand the reasons that people attempt suicide by developing a comprehensive, valid, and theoretically grounded self-report measure of attempt motivations. Perhaps the most important contributions of this study are 1) evidence that the IMSA provides reliable and valid information about a number of motivations for attempted suicide across diverse participants and situations and 2) that those motivations, their structure, and their clinical correlates are quite consistent. In all five samples, psychache and hopelessness were the most common and strongly endorsed motivations, while interpersonal influence was the least endorsed. Regardless of sample, the individual IMSA scales demonstrated good internal reliability, as did two superordinate IMSA factors identified through exploratory factor analysis. The two superordinate factors captured internal motivations (characterized by needing to escape or relieve unmanageable internal emotions and thoughts) and communication motivations (characterized by a desire to communicate with or influence another individual) in all samples and in both males and females. These two factors demonstrated good convergent and divergent validity when compared to another measure of suicide motivations. Furthermore, across samples, internal motivations were consistently associated with a moderately greater desire to die, while communication motivations were consistently associated with a slightly lower desire to die.

7.1 Structure of Attempt Motivations

Our finding that IMSA motivations were well represented by two superordinate dimensions, internal and communicative, is consistent with previous theoretical perspectives. For example, David Jobes (1995) theorized that there is a spectrum of suicide, with poles he labeled “intrapyschic” (reflecting suicidality that is private, hidden, and unlikely to be identified beforehand), and “interpsychic” (reflecting suicidality that is public, connected to interpersonal

challenges, and likely to be shared or performed in the presence of others). Similar to our findings, using the Suicide Status Form (SSF) Lento and colleagues found that intrapsychic or “self-oriented” suicidality was more common than interpsychic or “relationally-oriented” suicidality (Lento, Ellis, & Jobes, 2013). The IMSA factors differ in one important way from the poles that Jobes describes. Jobes’ spectrum of suicide would theorize that scales involving interpersonal situations (e.g., Burdensomeness, Low Belongingness) would fall on the interpsychic pole. However, our results demonstrate they actually fall on the Internal Motivations factor. The structure of the IMSA makes sense in that suicide attempts motivated by Burdensomeness or Low Belongingness likely represent the negative emotions and thoughts (i.e., internal states) associated with feeling like a burden or like one does not belong. Escaping the negative emotions and thoughts generated by these interpersonal states is more consistent with an internally-motivated attempter, rather than a communication-motivated attempter, even though those particular scales speak to distressing emotions generated by interpersonal situations.

In addition to Jobes’ work, a similar two dimensional structure has emerged in studies by other prominent suicide researchers. Marsha Linehan and her colleagues used the Parasuicide History Interview (PHI; PHI; Linehan, Heard, Brown, & Wagner, 2001) to assess reasons for self injurious behavior. These reasons were then divided into rationally derived dimensions. “Emotion relief” and “Interpersonal influence” were the dimensions most commonly endorsed as reasons for suicide attempts, the former appears conceptually similar to the IMSA internal dimensions and the latter to the IMSA communication dimension (Brown et al., 2002).

The fact that three independent lines of inquiry all converge on a two factor structure, with one factor encapsulating escape from an untenable internal state and the other reflecting influencing the external world, provides greater confidence in the natural occurrence

of this structure. Thus, a strength of the IMSA is that its superordinate structure closely aligns with existing theoretical and empirical perspectives.

7.2 Individual Attempt Motivations

The IMSA also yielded useful information about the relative endorsement of different suicide motivations. First, all ten motivations included were endorsed to some degree. It is noteworthy that suicide attempters reported a broad range of motivations for their attempts, as reflected by the fact that each IMSA scale was endorsed by some respondents. This pattern supports one assumption underlying the development of the IMSA, that there is a wide array of motivations for suicide attempts.

Second, some motivations were endorsed more than others. Of the individual IMSA scales, Psychache and Hopelessness were the most consistently and strongly endorsed. Across samples over 90% of participants rated these as at least important motivations for their attempt, a finding that was not true for other motivations. Though the IMSA was not specifically designed to test a given theory, the results are consistent with a newly emerging theory of suicidality. The Three-Step Theory (3ST; Klonsky & May, 2015) posits that the interaction of pain and hopelessness is the strongest predictor of suicide ideation. Analyses in that paper show that the interaction of these two constructs is a substantially stronger indicator of suicide ideation and its severity compared to the presence of either one individually. Furthermore, pain and hopelessness predict suicidal thoughts better than burdensomeness and low belongingness, two constructs that have been theorized to be necessary for the development of ideation (Joiner, 2005). The findings presented in this dissertation are consistent with the 3ST in that emotional pain and hopelessness were more strongly and consistently endorsed attempt motivations compared to burdensomeness and low belongingness, which were generally moderately endorsed.

Most noteworthy was the remarkable consistency in the pattern of motivation endorsement across samples. Regardless of being an adolescent or an adult, American or Canadian, male or female, an inpatient or part of a nonclinical sample, or reporting on a suicide attempt that occurred a few days or a few years ago, emotional pain and hopelessness were uniformly the most common and most strongly endorsed motivations for suicide attempts. Similarly, regardless of sample characteristics, communication motivations were the least endorsed. The uniform pattern of motivations was somewhat surprising, as common assumptions would posit differences, for example, that adolescents should endorse more impulsive attempt motivations (see Bridge, Goldstein, & Brent, 2006) or that women might attempt with more communicative motivations (Canetto & Sakinofsky, 1998). However the findings from the IMSA dispute these myths and suggest more consistent attempt motivations, a finding that may contribute to reduction in stigma surrounding suicide.

As mentioned earlier, two of the IMSA scales functioned in what could appear to be a counterintuitive manner. Specifically, the Burdensomeness and Low Belongingness scales are located on the Internal Motivations factor rather than Communication Motivation factor. One might have expected the social content of these two motivations to have aligned with Communication Motivations. However, suicide may be attempted to escape from aversive emotions (e.g., sadness, anxiety), including interpersonally oriented emotions (e.g., loneliness, shame), *without* being motivated by a desire to influence others interpersonally. For example, two individuals may both state that they felt suicidal because of the end of a relationship. One may be motivated to attempt in order to end painful feelings of loneliness (internal motivation), while the other may be motivated to attempt to make her ex-partner feel sorry (communication motivation). In short, the Internal factor includes all motivations related to escaping internally

distressing states, including those generated by interpersonal situations, whereas the Communication factor includes motivations related to influencing or communicating with other people. Burdensomeness and Low Belongingness fall into the former category.

7.3 Relationships between Attempt Motivations and Attempt Characteristics

Though suicide attempts are often described as a single behavior, there is great variability to their clinical characteristics, such as lethality, context, and method. Using the IMSA, we found that different motivations for attempted suicide related to some differences in the kind of suicide attempt made. Specifically, across all samples, internally motivated attempts were more strongly driven by a desire to die. In contrast, in the two samples with applicable data, attempts that were also motivated by communication had lower suicidal intent and were more likely to be performed such that intervention from others was likely.

These findings are consistent with previous studies reporting that intrapersonal reasons were correlated with intent and preparation, while interpersonal motivations were not (Holden et al., 1998; Hjelmeland et al., 2002). Our findings are also consistent with emerging evidence indicating that communicative attempt reasons confer a lower risk of a future attempt (O'Connor, Comtois, Atkins, Kerbrat & Thysell, 2012). One possibility is that the presence of socially oriented motivations signifies a continued connection to people, a desire to maintain these relationships, and thus a continued investment in living. Thus, presence of communications motivations may signify a persistent connection to living that may counterbalance a desire to die, whereas the absence of communication motivations may signify less ambiguity about the desire to die. Another possibility is that individuals who attempt suicide with communication motivations, particularly help-seeking, may be more open to accepting and following up with the referrals and treatment options that are often offered post-attempt.

It is important to note that even participants with substantial communicative motivations for their attempts also endorsed internal motivations. For example, 94% of participants who rated communication motivations as important or greater also rated internal motivations as at least important. Thus, rather than individuals having either internal or communication motivations, it is more accurate to say that suicide attempters tend to have internal motivations and that a subset also have communication motivations. This makes intuitive sense, as it is hard to imagine an individual attempting for purely communicative reasons. There are a myriad of both healthy and unhealthy ways to communicate interpersonally and to seek help that do not involve potentially ending one's life. In our samples, it was exceedingly unusual that someone would attempt suicide purely for communicative reasons, without also citing the effects of the emotional pain and hopelessness.

Though internal motivations were associated with somewhat greater desire for death and suicidal intent, they were not generally related to the actual lethality of the attempt. Similarly, though communication motivations were associated with less desire for death, less intent, and a greater likelihood of intervention, they were not associated with lower actual lethality. This potentially counterintuitive finding reflects an important and often under appreciated point in suicide risk assessment; suicidal intent and the lethality of attempts are not necessarily strongly related. The literature is mixed, while many studies find some relationship between intent and lethality, others find that the degree to which attempters intend to die is minimally related to the actual severity of their attempts (see Hasley et al., 2008 for a review). Individuals may have limited knowledge about the lethality of their chosen means or may misjudge the likelihood that they will be saved during the attempt. Among our samples, there was a small relationship between desire for death and lethality. This small relationship highlights the need to take all

attempts seriously, regardless of stated intent and stated motivations. Even people reporting a low desire to die or hope that their attempt will generate help may engage in highly dangerous suicide attempts.

7.4 Differences in Attempt Motivations

As noted earlier, findings from the IMSA were largely consistent across very distinct samples of attempters and between males and females. However, a few differences were noted. Some were most likely artifacts (e.g., split loading for Low Belongingness in the online sample only). However, a few differences may be more meaningful and deserve comment.

First, there were three differences in the mean endorsements of scales. Specifically, the adult inpatients endorsed Fearlessness more than the online participants or the undergraduates. This finding may be related to the somewhat greater lethality of their attempts, such that reduced fear about pain and death is a more important motivation for more severe attempts compared to less lethal attempts. This explanation would be consistent with Joiner's (2005) interpersonal theory of suicide that suggests that an increased ability to approach pain and death is an essential element of a serious or lethal suicide attempt.

Additionally, Interpersonal Influence was lower among the adolescent inpatients compared to the undergraduates, outpatients, and online sample. Combined with the observation that the adult inpatients had the second lowest endorsement of the Interpersonal Influence scale, two possible explanations arise. One is that attempts that result in hospitalization may reflect more serious attempt and thus may be less likely to be motivated by changing ones environment. Another explanation is that attempters may be less likely to endorse interpersonal influence motivations immediately after their attempts, perhaps for fear of judgment or of not being taken

seriously. Further research using a test retest design could help support or dispute this potential explanation.

Finally, females endorsed the Psychache and Escape scales somewhat more than males. These motivations may have truly resonated more with women and girls or this finding may reflect a cultural bias in which it is simply more acceptable for women to express emotional pain (see Brody & Hall, 2008). Despite this small difference in the strength of endorsement, it is notable that for both males and females, the Hopelessness, Psychache, and Escape scales were the most strongly and commonly endorsed. Each of the non-anticipated findings discussed above requires replication to determine whether they represent true differences in suicide attempt motivations by population or whether they are more reflective of measurement error.

Second, two samples exhibited a slightly different factor structure. Among the online participants and the adult inpatients, impulsive attempt motivations loaded with the Communication Motivations factor (.45-.60), while in the undergraduates, outpatients, and adolescent inpatients impulsivity had a marginal loading on this factor (.29-.31). Interestingly, none of the obvious third variables can account for this difference. For example, the two samples in which the Impulsivity scale loaded with the Communication Motivations factor were dissimilar. The online sample is the most removed from their attempts, the most balanced in terms of gender, and tended to be reporting on their first attempt. The adult inpatient sample was the closest in time to their attempts, was predominantly female, and was more likely to be reporting on a second attempt, rather than their first. Furthermore, there were no differences in endorsement of the Impulsivity scale across samples. Additionally, the inclusion of the Impulsivity scale on the Communication Motivations factor did not substantively change any of the relationships between that factor and attempt characteristics.

One possible explanation for the difference in the factor structure is the slightly better functioning of the Impulsivity scale in the online and adult inpatient samples ($\alpha s = .81$ and $.85$) compared to the other samples ($\alpha s = .66-.79$). In the samples where the Impulsivity scale functions particularly well it may better capture the construct of impulsive attempt motivations, while in the samples where the scale was less reliable, it may be tapping into other constructs and thus its mean scores may not be capturing the construct of impulsive motivations as well. Though the factor structure generally remained intact, further replication is necessary to clarify these inconsistencies.

7.5 Contributions and Applications of the IMSA

The IMSA improves upon existing measures in four important ways. First, it covers a broader range of suicide motivations, such as hopelessness and fearlessness, that are not represented on existing measures. As it turns out, hopelessness is the most widely endorsed motivation for suicide and thus likely an important motivation to capture. Second, the IMSA is grounded in major theories of suicidality, which facilitates application of these theories to clinical contexts and evaluation of these theories in research contexts. Though the focus of this project was primarily on the IMSA factors, the inclusion of individual scale that align with constructs from major theories of suicide allows future researchers to assess the relative importance of various motivations and the relationship between specific motivations and specific characteristics of attempt. Third, IMSA motivations are represented by a robust, replicable two-factor structure; previous measures of motivations have yielded unstable factor structures (Hjelmeland et al., 2002; Holden & DeLisle, 2006). Finally, in contrast to the RASQ, the only other measure of suicide attempt motivations with published psychometric properties (Holden et

al., 1998), the IMSA was developed and tested exclusively with suicide attempters, as opposed to samples containing significant proportions of non-attempters.

The development of the IMSA provides a useful tool for both clinical and research contexts. First, in the clinical realm, administering the IMSA may lead to better understanding of what problem an individual is trying to solve by attempting suicide. By better assessing the problems motivating the behavior, a clinician can more accurately tailor interventions to help prevent another suicide attempt. For example, a person whose attempt is motivated by desire to end emotional pain may be helped by learning skills to more effectively tolerate and reduce distress, whereas a person whose attempt was motivated by a need to communicate with someone else may benefit from training in interpersonal effectiveness skills. The weeks and months after a suicide attempt are a particularly critical time, as people are greatest at risk of re-attempting or dying by suicide (Kan, Ho, Dong, & Dunn, 2007; Tidemalm, Långström, Lichtenstein, & Runeson, 2008). Thus, it is especially important to have effective, targeted treatment post-attempt and the IMSA could serve to facilitate identifying such a treatment.

Understanding the motivations for or functions of suicidal behavior is a common therapeutic technique in dialectical behavior therapy (DBT; Linehan, 1993), one of the only interventions designed specifically to target suicidality (Linehan, 1993; Kliem, Kröger, & Kosfelder, 2010). DBT uses chain analysis to develop a detailed functional understanding of the thoughts, events, and emotions that led to a suicide attempt. Without being part of specific therapeutic tradition, the IMSA provides a relatively brief, self-report format for beginning to understand the motivations or functions of an individual's suicide attempt. Stigma about suicidality may inhibit mental health professionals and patients from asking about or disclosing

motivations for attempts. A self-report measure, such as the IMSA may help bypass barriers to disclosure.

Second, in the area of suicide research, the IMSA provides a tool for other investigators interested in assessing motivations and refining existing theories of suicide. The IMSA can be of use to any program of research desiring a comprehensive assessment of motivations for attempted suicide. In addition, the IMSA can facilitate empirical evaluation of longstanding models about why people attempt suicide, leading to the refinement and advancement of suicide theory. For example, a number of reasons from distinct suicidality theories (e.g. hopelessness, psychache, escape) appear to be well-represented by a superordinate Internal dimension. It will be useful, then, for theory to clarify the ways in which these motivations overlap conceptually as well as the ways in which they are different. Doing so could lead to theories of suicide that are both more parsimonious and comprehensive. Future versions of the IMSA should be revised to include novel motivations for suicide attempts that are put forth by new theories.

7.6 Strengths and Limitations

This project has a number of strengths that bolster our confidence in its conclusions. First, the IMSA was examined in five distinct samples that varied in a number of important characteristic, such as age, nationality, racial composition, severity of attempt, time since attempt, recruitment site, and method of assessment. The use of multiple samples drawn from diverse populations allowed us to examine both variability and generalizability in the nature and endorsement of attempt motivations. Second, key aspects of attempt motivations replicated across samples. Thus, the findings reported provide impressive converging evidence supporting the reliability and validity of the IMSA across populations, as well as key findings regarding the most common motivations (e.g., hopelessness and psychache) and the relationship of motivations

to clinical variables (e.g., greater internal motivations correspond with a greater desire to die). Third, in four of the five samples the suicide attempt reported was thoroughly assessed with a gold standard interview, increasing confidence that the behaviors reported were indeed suicide attempts as defined by the field. Fourth, the project included a relatively large sample, 450 people who attempted suicide in total. This is particularly notable in light of the relatively low base rate of suicide attempts in the population and the challenges to recruitment due to the stigma surrounding suicidality.

This project also has important limitations that suggest avenues for further research. First, participants were asked to report retrospectively on the motivations for their attempts. Two characteristics of suicidality make it difficult (or impossible) to measure attempt motivations directly before they occur. First, suicide attempts are infrequent and unpredictable. Second, researchers have an ethical obligation to intervene should they believe a suicide attempt is imminent. However, it remains important to consider how reporting on motivations after the attempt occurs may shape responses. It is possible that the actual consequences of the attempt influence attempters' understanding of the motivations for their behavior.

Additionally, the length of time between the attempt and assessment may also influence reporting. In some samples, participants reported on attempts that occurred years in the past. Though instructed to try to remember their mindset at the time of the attempt, recall bias and reinterpretation of the motivations over time may have had an influence. The lack of systematic difference between the two inpatient samples, who reported on their attempts much closer to their occurrence, and the three other samples suggests minimal time effects. However, a test retest study is in the best position to assess this question by examining whether self reported attempt motivations change over time within an individual.

Second, the size of four of the five samples was small, meeting the lower bounds of the participant-to-scale ratio needed for factor analysis. A very large sample would improve confidence in the factor structure. However, this limitation is ameliorated to a degree given that a conceptually similar factor structure was found in each sample. The next step would be to carry out a confirmatory factor analysis with a large, novel sample of suicide attempters to assess whether an independent sample fits the factor structure that has been found thus far.

Third, this study only looked at motivations for non-lethal suicide attempts; whether these results generalize to fatal suicide attempts is unknown. This is a critical question, as suicide death is the outcome we most want to prevent. Future work focused specifically on nearly lethal suicide attempts may better approximate motivations for suicide deaths. Such studies would clarify the degree of similarity between non-lethal attempt motivations and lethal attempt motivations. Additionally, large longitudinal studies of previous suicide attempters or other high-risk individuals may also identify which motivations are most associated with subsequent suicide deaths.

Fourth, while these samples had significant representation of participants of Caucasian and East Asian descent, other groups were underrepresented. It will be important to examine the mean endorsements and structure of IMSA motivations in other racial and ethnic groups. Furthermore, though our study included three samples from Canada and two from the United States, all of our participants were located in North America. To understand whether attempt motivations and their structure are truly universal, cross cultural studies are required.

7.7 Future Directions

Our findings also generate important new directions for future inquiry. First, it is unknown whether suicide motivations remain constant for a given individual across multiple

attempts or whether they vary by situation. The state versus trait aspect of suicidality is not well understood. That is, some individuals may be prone to suicidal behavior regardless of trigger or motivation while others may only be sensitive to certain motivations. This question would be best addressed by longitudinal studies that assess motivations and attempts over time, although retrospective studies examining individuals with multiple attempts may also be useful.

Second, the IMSA may also be a useful tool among suicide ideators who have not yet made an attempt, even though it was designed for use with individuals who have already attempted suicide. A modified version could assess what ideators think attempting suicide will accomplish. This information could be used to facilitate a conversation between the therapist and suicidal client about alternative means to accomplish those same goals (e.g., reduce emotional pain, correct perceptions of burdensomeness, communicate a need to someone else). This information may help therapists in choosing appropriate interventions. The IMSA may also help the suicidal client identify what triggers his or her suicidal desires and subsequently become better prepared to respond to those triggers when they arise. For example, a client who identifies low belongingness as a key motivator for their suicide desire could then try to prepare ahead of time for situations that may ignite those feelings (e.g., not getting invited to a party, a friend cancelling plans). Thus, a modified version of the IMSA may be a useful tool in preventing the transition from suicidal thoughts to attempts.

Third, as is common in scale development, a future goal for the IMSA is the validation of a brief version. The current version was constructed with the goal of strong psychometrics and comprehensive coverage of potential motivations. As all the motivations are endorsed to some degree, it is unlikely a brief version could be created by eliminating entire scales. However,

fewer items per scale may be sufficient. A brief version would be particularly useful in outpatient and emergency room settings, where the time available to complete assessments is quite limited.

Finally, as mentioned above, evidence for the IMSA's validity and clinical utility suggest the possibility that the IMSA could improve case conceptualization and treatment planning for individuals who have attempted suicide. Future studies should evaluate whether administering the IMSA can improve treatment outcomes either as a supplement to treatment-as-usual or in the context of developing or refining specialized treatments for suicidal patients. It is only by untangling and explaining the nuances of suicidality, include what motivates an individual to try to end his or her life, that we can more effectively intervene, and by doing so reduce the pain, heartache, and lost potential that results from suicide. The IMSA will hopefully contribute to this goal.

Tables

Table 1. Means, endorsement, range, and reliability coefficients for the IMSA scales in the initial sample

Scales	<i>Mean</i> (<i>SD</i>)	Undergraduates N=66			Outpatients N=53			α^1
		Important or higher (%)	Reported Range		Important or higher (%)	Reported Range		
Hopelessness	14.7 (4.4)	94%	3-20	.77	15.4 (4.7)	91%	0-20	.85
Psychache	15.8 (4.4)	92%	4-20	.84	15.1 (4.6)	94%	3-20	.84
Escape	13.0 (5.2)	82%	0-20	.80	13.0 (5.0)	85%	0-20	.77
Burdensomeness	7.4 (6.1)	42%	0-20	.88	8.3 (6.2)	54%	0-20	.87
Low Belongingness	8.9 (5.4)	65%	0-20	.74	9.1 (5.3)	57%	0-20	.73
Fearlessness	7.5 (5.1)	42%	0-20	.74	8.3 (5.3)	56%	0-19	.75
Impulsivity	5.9 (4.8)	38%	0-16	.74	6.2 (4.4)	39%	0-19	.66
Problem-Solving	8.5 (4.1)	62%	0-17	.55	8.5 (4.0)	61%	0-16	.47
Interpersonal Influence	4.8 (5.9)	27%	0-20	.89	3.9 (4.8)	24%	0-20	.80
Help Seeking	6.1 (5.7)	35%	0-19	.84	5.5 (4.8)	35%	0-15	.74

Note. ¹Reliability coefficients were calculated before missing data was imputed.

Table 2. Correlations among IMSA scales in the initial sample.

Scales	1	2	3	4	5	6	7	8	9
1. Hopelessness	-	.58	.43	.32	.23	.37	-.24	-.14	-.21
2. Psychache	.38	-	.66	.40	.48	.38	-.16	.08	.15
3. Escape	.40	.57	-	.63	.59	.50	-.11	.18	.24
4. Burdensomeness	.13	.11	.39	-	.39	.57	.07	.24	.18
5. Low Belongingness	.30	.17	.40	.29	-	.36	.01	.25	.33
6. Fearlessness	.46	.20	.25	.26	.44	-	.04	.17	.05
7. Impulsivity	.01	.06	.11	.14	.22	.21	-	.23	.20
8. Interpersonal Influence	.17	.20	.17	.04	.30	.21	.23	-	.70
9. Help-Seeking	.10	.21	.13	.00	.30	.14	.27	.68	-

Note. Upper triangle comprises correlations from the outpatient sample. Lower triangle comprises correlations from the undergraduate sample. Correlations from .25 to .32 are significant at $p < .05$. Correlations from .32 to .43 are significant at $p < .01$. Correlations greater than .44 are significant at $p < .001$.

Table 3. Pattern matrix with a 2-factor solution in the initial sample

Scales	Undergraduates N=66		Outpatients N=53	
	Factor 1 ($\alpha = .73$) Internal Motivations	Factor 2 ($r_{sb} = .81$) Communication Motivations	Factor 1 ($\alpha = .84$) Internal Motivations	Factor 2 ($r_{sb} = .82$) Communication Motivations
Hopelessness	.59	-.02	.64	-.43
Psychache	.52	.05	.77	-.10
Escape	.79	-.07	.88	.03
Burdensomeness	.44	-.09	.65	.10
Low Belongingness	.49	.23	.61	.24
Fearlessness	.51	.10	.61	.01
Impulsivity	.09	.29	-.15	.32
Interpersonal Influence	.03	.77	.11	.76
Help-Seeking	-.09	.91	.11	.82

Note. Factor loadings equal to or greater than .40 are bolded.

Table 4. Convergent and divergent validity in the initial sample

	Undergraduates N=66		Outpatients N=53	
	Internal Motivations Factor	Communication Motivations Factor	Internal Motivations Factor	Communication Motivations Factor
Internal Perturbations (RASQ)	0.58	0.18	0.62	0.05
Extrapunitive/Manipulative (RASQ)	0.18	0.83	0.09	0.78

Note. Correlations above .57 are significant at $p < .001$. None of the other correlations displayed are significant.

Table 5. Other measures of attempt motivations and attempt characteristics in the initial sample

	Undergraduates				Outpatients			
	<i>Mean (SD)</i>	<i>N</i>	Reported Range	α^1	<i>Mean (SD)</i>	<i>N</i>	Reported Range	α^1
Internal Perturbations (RASQ)	29.0 (6.7)	66	9-41	.60	28.3 (8.3)	53	9-42	.71
External/Manipulative (RASQ)	22.6 (14.0)	66	8-54	.92	18.1 (10.5)	53	8-47	.82
“Wanted to die” motivation ^a	2.9 (1.3)	64	0-4		2.8 (1.4)	53	0-4	
Intent ^b (self-endorsed)	4.7 (1.1)	66	1-6		4.9 (1.2)	52	2-6	
Intent ^c (interviewer-rated)	12.9 (4.7)	66	4-25	.78	14.3 (5.2)	52	5-24	.79
Pre-attempt communication ^d	38%	66			39%	52		
Probability of intervention ^e (self-endorsed)	1.1 (0.8)	65	0-2		1.1 (0.9)	52	0-2	
Probability of intervention ^f (interviewer-rated)	2.9 (1.0)	66	1-5		2.7 (1.1)	52	1-5	
Medical risk of means ^g	2.8 (1.2)	66	1-6		3.3 (1.4)	52	1-6	
Lethality of injuries ^h	2.4 (1.4)	66	0-6		2.4 (1.5)	52	0-5	

Note. ¹ Reliability coefficients were calculated before missing data was imputed. ^aMeasured by the IMSA (May & Klonsky, 2013). ^bMeasured by SASII item 10. ^cMeasured by the SIS (Beck, 1974). ^dMeasured by SASII items 15 and 16 combined and dichotomized (Linehan et al., 2006). ^eMeasured by SASII item 19 (Linehan et al., 2006). ^fMeasured by SASII item 20 (Linehan et al., 2006) item. ^gMeasured by SASII item 8 (Linehan et al., 2006). ^hMeasured by SASII item 22 (Linehan et al., 2006).

Table 6. Correlations between attempt characteristics and IMSA motivations in the initial sample (combined)

Attempt Characteristic	Internal Motivations Factor	Communication Motivations Factor
“Wanted to die” motivation ^a	.37	-.07
Intent ^b (self-endorsed)	.18	-.18
Intent ^c (interviewer-rated)	.15	-.22
Pre-attempt communication ^d	.07	.07
Probability of intervention ^e (self-endorsed)	-.05	.07
Probability of intervention ^f (interviewer-rated)	-.12	.22
Medical risk of means ^g	.13	-.13
Lethality of injuries ^h	.02	-.04

Note. Correlation greater than .21 are significant at $p < .05$; Correlations greater than .36 are significant at $p < .001$. $N = 117-119$: ^aMeasured by the IMSA (May & Klonsky, 2013). ^bMeasured by SASII item 10. ^cMeasured by the SIS (Beck, 1974). ^dMeasured by SASII items 15 and 16 combined and dichotomized (Linehan et al., 2006). ^eMeasured by SASII item 19 (Linehan et al., 2006). ^fMeasured by SASII item 20 (Linehan et al., 2006) item. ^gMeasured by SASII item 8 (Linehan et al., 2006). ^hMeasured by SASII item 22 (Linehan et al., 2006).

Table 7. Means, endorsement, range, and reliability coefficients for the IMSA scales in the adult inpatient sample

Scales	<i>Mean (SD)</i>	Important or higher (%)	Reported Range	α^1
Hopelessness	16.2 (3.6)	95%	5-20	.74
Psychache	16.1 (4.2)	95%	3-20	.86
Escape	13.4 (5.2)	83%	0-20	.80
Burdensomeness	9.8 (6.8)	61%	0-20	.91
Low Belongingness	7.8 (5.1)	54%	0-18	.77
Fearlessness	10.2 (5.2)	73%	0-20	.73
Impulsivity	6.8 (5.3)	46%	0-18	.81
Problem-Solving	10.4 (4.7)	73%	0-20	.69
Interpersonal influence	2.6 (3.3)	9%	0-14	.78
Help-Seeking	6.8 (5.6)	41%	0-18	.83

Note: ¹Reliability coefficients were calculated before missing data was imputed. N=59

Table 8. Correlations among IMSA scales in the adult inpatient sample.

Scales	1	2	3	4	5	6	7	8	9
1. Hopelessness	-	.58	.52	.47	.40	.47	.13	.19	.09
2. Psychache		-	.61	.47	.53	.28	.22	.26	.27
3. Escape			-	.48	.53	.21	.18	.22	.14
4. Burdensomeness				-	.50	.34	.12	.30	.19
5. Low Belongingness					-	.41	.37	.39	.33
6. Fearlessness						-	.21	.34	.21
7. Impulsivity							-	.34	.44
8. Interpersonal Influence								-	.71
9. Help-Seeking									-

Note. Correlations from .26 to .32 are significant at $p < .05$ Correlations from .33 to .46 are significant at $p < .01$. Correlations greater than .47 are significant at $p < .001$.

Table 9. Pattern matrix with a 2-factor solution in adult inpatient sample

Scales	Factor 1 ($\alpha=.82$) Internal Motivations	Factor 2 ($\alpha= .72$) Communication Motivations
Hopelessness	.78	-.13
Psychache	.75	.03
Escape	.76	-.08
Burdensomeness	.64	.03
Low Belongingness	.60	.24
Fearlessness	.41	.18
Impulsivity	.10	.45
Interpersonal Influence	.06	.76
Help-Seeking	-.12	.94

Note: Factor loadings equal to or greater than .40 are bolded. N=59

Table 10. Convergent and divergent validity in the adult inpatient sample

	Internal Motivations Factor	Communication Motivations Factor ¹	Communication Motivations Factor (initial) ²
Internal Perturbations (RASQ)	NA ³	NA ³	NA ³
Extrapunitive/Manipulative (RASQ)	.10	.56	.61

Note. Correlations of .56 or greater are significant at $p < .001$. N=34. ¹The Communication factor includes the Interpersonal Influence, Help-Seeking, and Impulsivity scales. ²The Communication factor (initial) includes the Interpersonal Influence and Help-Seeking scales. ³The Internal Perturbations scale did not function well in this sample and was thus dropped from analyses.

Table 11. Other measures of attempt motivations and attempt characteristics in the adult inpatient sample

	<i>Mean (SD)</i>	<i>N</i>	Reported Range	α^1
Internal Perturbations (RASQ)	28.3 (4.2)	34	17-39	.00
External/Manipulative (RASQ)	14.8 (8.3)	34	8-35	.85
“Wanted to die” motivation ^a	3.2 (1.3)	59	0-4	
Intent ^b (self-endorsed)	5.1 (0.9)	57	3-6	
Intent ^c (interviewer-rated)	13.9 (5.2)	59	5-26	.81
Pre-attempt communication ^d	33%	58		
Probability of intervention ^e (self-endorsed)	1.3 (0.7)	56	0-2	
Probability of intervention ^f (interviewer-rated)	3.3 (1.1)	59	1-5	
Medical risk of means ^g	4.1 (1.2)	59	1-6	
Lethality of injuries ^h	3.3 (1.5)	59	0-6	

Note. ¹ Reliability coefficients were calculated before missing data was imputed. ^aMeasured by the IMSA (May & Klonsky, 2013). ^bMeasured by SASII item 10. ^cMeasured by the SIS (Beck, 1974). ^dMeasured by SASII items 15 and 16 combined and dichotomized (Linehan et al., 2006). ^eMeasured by SASII item 19 (Linehan et al., 2006). ^fMeasured by SASII item 20 (Linehan et al., 2006) item. ^gMeasured by SASII item 8 (Linehan et al., 2006). ^hMeasured by SASII item 22 (Linehan et al., 2006).

Table 12. Correlations between attempt characteristics and IMSA motivations in the adult inpatient sample

Attempt Characteristic	Internal Motivations Factor	Communication Motivations Factor	Communication Motivations Factor (initial)
“Wanted to die” motivation ^a	.40	-.13	-.12
Intent ^b (self-endorsed)	.35	-.09	-.08
Intent ^c (interviewer-rated)	.23	-.32	-.27
Pre-attempt communication ^d	-.08	.01	.11
Probability of intervention ^e (self-endorsed)	-.03	.27	.25
Probability of intervention ^f (interviewer-rated)	-.24	.18	.19
Medical risk of means ^g	.25	-.09	-.16
Lethality of injuries ^h	.10	.08	-.01

Note: Correlation greater than .26 are significant at $p < .05$; Correlations greater than .34 are significant at $p < .01$. $N = 56-59$. ^aMeasured by the IMSA (May & Klonsky, 2013). ^bMeasured by SASII item 10. ^cMeasured by the SIS (Beck, 1974). ^dMeasured by SASII items 15 and 16 combined and dichotomized (Linehan et al., 2006). ^eMeasured by SASII item 19 (Linehan et al., 2006). ^fMeasured by SASII item 20 (Linehan et al., 2006) item. ^gMeasured by SASII item 8 (Linehan et al., 2006). ^hMeasured by SASII item 22 (Linehan et al., 2006).

Table 13. Means, endorsement, range, and reliability coefficients for the IMSA scales in the online sample

Scales	Mean (SD)	Important or higher (%)	Reported Range	α^1
Hopelessness	15.6 (4.0)	96%	0-20	.82
Psychache	15.3 (4.9)	91%	1-20	.90
Escape	12.8 (5.1)	82%	0-20	.80
Burdensomeness	8.0 (6.3)	49%	0-20	.91
Low Belongingness	9.5 (5.3)	63%	0-20	.78
Fearlessness	7.8 (5.4)	50%	0-20	.82
Impulsivity	5.2 (5.4)	28%	0-20	.85
Problem-Solving	9.0 (4.9)	60%	0-20	.70
Interpersonal Influence	3.6 (4.8)	21%	0-19	.86
Help-Seeking	5.4 (5.3)	33%	0-20	.85

Note. ¹Reliability coefficients were calculated before missing data was imputed. N=222

Table 14. Correlations among IMSA scales in the online sample

Scales	1	2	3	4	5	6	7	8	9
1. Hopelessness	-	.56	.47	.21	.35	.37	.00	.08	.07
2. Psychache		-	.59	.22	.26	.32	.08	.10	.09
3. Escape			-	.52	.34	.47	.18	.23	.21
4. Burdensomeness				-	.31	.38	.30	.30	.27
5. Low Belongingness					-	.30	.23	.42	.41
6. Fearlessness						-	.14	.27	.21
7. Impulsivity							-	.54	.50
8. Interpersonal Influence								-	.77
9. Help-Seeking									-

Note. Correlations from .14 to .17 are significant at $p < .05$ Correlations from .18 to .22 are significant at $p < .01$. Correlations greater than .23 are significant at $p < .001$.

Table 15. Pattern matrix with a 2-factor solution in the online sample

Scales	Factor 1 ($\alpha=.77$) Internal Motivations	Factor 2 ($\alpha= .81$) Communication Motivations
Hopelessness	.71	-.14
Psychache	.74	-.13
Escape	.80	.04
Burdensomeness	.40	.27
Low Belongingness	.35	.36
Fearlessness	.52	.13
Impulsivity	-.02	.60
Interpersonal Influence	-.03	.91
Help-Seeking	-.05	.86

Note. Factor loadings equal to or greater than .40 are bolded. N= 222

Table 16. Convergent and divergent validity in the online sample

	Internal Factor	Communication Factor ¹	Communication Factor (initial) ²
Internal Perturbations (RASQ)	.59	.35	.31
Extrapunitive/Manipulative (RASQ)	.26	.81	.86

Note: All correlations are significant at $p < .001$. N's = 218-219. ¹The Communication factor includes the Interpersonal Influence, Help-Seeking, and Impulsivity scales. ²The Communication factor (initial) includes the Interpersonal Influence and Help-Seeking scales.

Table 17. Other measures of attempt motivations and attempt characteristics in the online sample

	<i>Mean (SD)</i>	N	Reported Range	α^1
Internal Perturbations (RASQ)	29.1 (7.0)	218	9-42	.64
External/Manipulative (RASQ)	18.0 (12.9)	219	8-56	.93
“Wanted to die” motivation ^a	3.0 (1.2)	222	0-4	
Intent ^b (self-reported)	4.4 (1.6)	218	0-6	
Pre-attempt communication ^c	44%	218	0-1	
Probability of intervention (self-reported) ^d	1.2 (0.8)	216	0-2	
Lethality of injuries ^e	2.3 (1.4)	217	0-6	

Note. ¹ Reliability coefficients were calculated before missing data was imputed. ^aMeasured by the IMSA (May & Klonsky, 2013). ^bMeasured by a modified self report version of SASII item 10 (Linehan et al., 2006). ^cMeasured by a modified self-report version of SASII items 15 and 16 (Linehan et al., 2006). ^dMeasured by a modified self-report version of SASII item 19 (Linehan et al., 2006). ^eMeasured by a modified self-report version of SASII item 22 (Linehan et al., 2006).

Table 18. Correlations between attempt characteristics and IMSA motivations in the online sample

Attempt Characteristic	Internal Motivations Factor	Communication Motivations Factor ¹	Communication Motivations Factor (initial) ²
“Wanted to die” motivation ^a	.39	-.12	-.15
Intent ^b (self-reported)	.14	-.25	-.18
Pre-attempt communication ^c	.14	.36	.37
Probability of intervention (self-reported) ^d	-.12	.13	.12
Lethality of injuries ^e	.08	-.14	-.12

Note: N's = 217-222. Correlation from .14 to .17 are significant at $p < .05$; Correlations greater than .24 are significant at $p < .001$.¹The Communication factor includes the Interpersonal Influence, Help-Seeking, and Impulsivity scales ²The Communication factor (initial) includes the Interpersonal Influence and Help-Seeking scales. ^aMeasured by the IMSA (May & Klonsky, 2013). ^bMeasured by a modified self report version of SASII item 10 (Linehan et al., 2006). ^cMeasured by a modified self-report version of SASII items 15 and 16 (Linehan et al., 2006). ^dMeasured by a modified self-report version of SASII item 19 (Linehan et al., 2006). ^eMeasured by a modified self-report version of SASII item 22 (Linehan et al., 2006).

Table 19. Means, endorsement, range, and reliability coefficients for the IMSA scales in inpatient adolescent sample

	<i>Mean (SD)</i>	Important or higher (%)	Reported Range	α'
Hopelessness	14.8 (4.1)	98%	5-20	.79
Psychache	15.3 (4.8)	90%	2-20	.90
Escape	14.1 (4.7)	90%	3-20	.83
Burdensomeness	10.3 (6.1)	64%	0-20	.89
Low Belongingness	9.2 (5.5)	60%	0-20	.79
Fearlessness	8.0 (5.9)	46%	0-20	.85
Impulsivity	6.5 (5.1)	38%	0-18	.79
Problem-Solving	7.9 (4.8)	56%	0-18	.65
Interpersonal Influence	1.6 (2.9)	6%	0-12	.74
Help-Seeking	4.5 (4.6)	24%	0-16	.79

Note. ¹Reliability coefficients were calculated before missing data was imputed. N=50.

Table 20. Correlations among IMSA scales in the inpatient adolescent sample

Scales	1	2	3	4	5	6	7	8	9
1. Hopelessness	-	.66	.75	.49	.64	.63	.19	.08	.14
2. Psychache		-	.70	.39	.58	.54	.17	.17	.16
3. Escape			-	.58	.62	.57	.09	.04	-.02
4. Burdensomeness				-	.66	.49	.11	.17	.07
5. Low Belongingness					-	.63	.20	.29	.30
6. Fearlessness						-	.14	.17	.04
7. Impulsivity							-	.23	.26
8. Interpersonal Influence								-	.53
9. Help-Seeking									-

Note. Correlations from .26 to .28 are significant at $p < .05$ Correlations from .29 to .39 are significant at $p < .01$. Correlations greater than .40 are significant at $p < .001$.

Table 21. Pattern matrix with a 2-factor solution in inpatient adolescent sample

	Factor 1 ($\alpha = .89$) Internal Motivations	Factor 2 ($r_{sb} = .69$) Communication Motivations
Hopelessness	.85	-.03
Psychache	.73	.05
Escape	.92	-.20
Burdensomeness	.65	.04
Low Belongingness	.75	.26
Fearlessness	.73	.00
Impulsivity	.11	.31
Interpersonal Influence	.01	.68
Help-Seeking	-.07	.79

Note. Factor loadings greater than .40 are bolded. N=50.

Table 22. Other measures of attempt characteristics in inpatient adolescent sample

	<i>Mean (SD)</i>	<i>N</i>	Reported Range
“Wanted to die” motivation ^a	3.1 (1.2)	50	0-4
Lethality of injuries ^b	1.3 (1.3)	47	0-4

Note. ^aMeasured by the IMSA (May & Klonsky, 2013). ^bMeasured by the C-SSRS (Posner et al., 2011).

Table 23. Correlations between attempt characteristics and IMSA factors in inpatient adolescent sample

	Internal Motivations Factor	Communication Motivations Factor
“Wanted to die” motivation ^a	.67	-.19
Lethality ^b	.20	.11

Note. Correlations greater than .66 are significant at $p < .001$. $N = 47-50$. ^aMeasured by the IMSA (May & Klonsky, 2013). ^bMeasured by the C-SSRS (Posner et al., 2011)

Table 24. ANOVA comparing mean endorsements of 9 IMSA scales between samples

	<i>Means (SD)</i>					<i>F</i>	<i>df</i>	<i>p</i>
	Undrgrds N=66	Outptns. N=53	Adult Inptns. N=59	Online N=222	Adol Inptns. N=50			
Hopelessness	14.7 (4.4)	15.4 (4.7)	16.2 (3.6)	15.6 (4.0)	14.8 (4.1)	1.47	446	.209
Psychache	15.8 (4.4)	15.1 (4.6)	16.1 (4.2)	15.3 (4.9)	15.3 (4.8)	0.53	446	.715
Escape	13.0 (5.2)	13.0 (5.0)	13.4 (5.2)	12.8 (5.1)	14.1 (4.7)	0.74	446	.563
Burdensomeness	7.4 (6.1)	8.3 (6.2)	9.8 (6.8)	8.0 (6.3)	10.3 (6.1)	2.40	446	.051
Low Belongingness	8.9 (5.4)	9.1 (5.3)	7.8 (5.1)	9.5 (5.3)	9.2 (5.5)	1.26	446	.286
Fearlessness	7.5 (5.1) ^{ab}	8.3 (5.3) ^{ab}	10.2 (5.2) ^a	7.8 (5.4) ^b	8.0 (5.9) ^{ab}	2.67	446	.032
Impulsivity	5.9 (4.8)	6.2 (4.4)	6.8 (5.3)	5.2 (5.4)	6.5 (5.1)	1.57	446	.180
Interpersonal Influence ¹	4.8 (5.9) ^a	3.9 (4.8) ^a	2.6 (3.3) ^{ab}	3.6 (4.8) ^a	1.6 (2.9) ^b	5.68	151.0	.000
Help-Seeking	6.1 (5.7)	5.5 (4.8)	6.8 (5.6)	5.4 (5.3)	4.5 (4.6)	1.55	446	.186

Note. ¹ The Welch *F*-ratio is reported due to the violation of the assumption of homogeneity of variance. Post-hoc analyses were conducted for scales with significant omnibus ANOVA's. Values that share superscripts are not statistically significantly different.

Table 25. Correlation between desire for death and lethality across samples

Sample	<i>r</i>
Undergrads	.15
Outpatients	.12
Adult Inpnts.	.10
Online	.19
Adol. Inpnts	.14

Note. Correlation greater than .18 are significant at $p < .01$.

Table 26. ANOVA comparing mean endorsements of 9 IMSA scales between males and females in the combined sample

	<i>Means (SD)</i>		<i>F</i>	<i>df</i>	<i>p</i>
	Males N=164	Females N=286			
Hopelessness	14.9 (4.4)	15.7 (3.9)	3.48	448	.063
Psychache ¹	14.0 (5.0)	16.3 (4.3)	26.06	300.1	.000
Escape	12.0 (5.2)	13.7 (4.9)	12.35	448	.000
Burdensomeness	8.0 (6.2)	8.7 (6.4)	1.23	448	.269
Low Belongingness ¹	9.3 (5.6)	9.1 (5.1)	0.15	315.8	.699
Fearlessness	7.9 (5.2)	8.3 (5.5)	0.57	448	.451
Impulsivity	5.9 (5.0)	5.7 (5.3)	0.10	448	.748
Interpersonal Influence	3.6 (4.7)	3.4 (4.7)	0.24	448	.626
Help-Seeking	5.7 (5.2)	5.5 (5.3)	0.10	448	.753

Note. ¹The Welch *F*-ratio is reported due to the violation of the assumption of homogeneity of variance.

Table 27. Pattern matrix with a 2-factor solution males versus females in the combined sample

	Factor 1		Factor 2	
	Internal Motivations		Communication Motivations	
	Male ($\alpha = .76$)	Female ($\alpha = .73$)	Male ($\alpha = .76$)	Female ($\alpha = .74$)
Hopelessness	.73	.72	-.22	-.12
Psychache	.73	.69	-.07	-.06
Escape	.85	.78	-.04	-.02
Burdensomeness	.51	.51	.14	.12
Low Belongingness	.56	.43	.18	.33
Fearlessness	.59	.53	.13	.06
Impulsivity	-.07	.09	.47	.48
Interpersonal Influence	.02	-.03	.83	.81
Help-Seeking	.01	-.08	.89	.83

Note. Factor loadings greater than .40 are bolded.

Figures

Figure 1. Edwin Shneidman's Cubic Model of Suicide (as depicted in Shneidman, 1985)

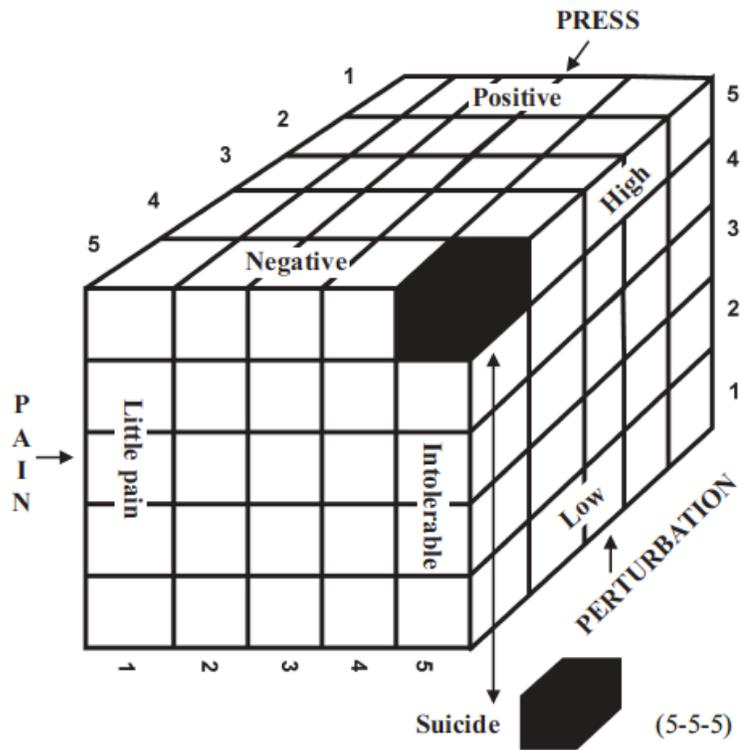
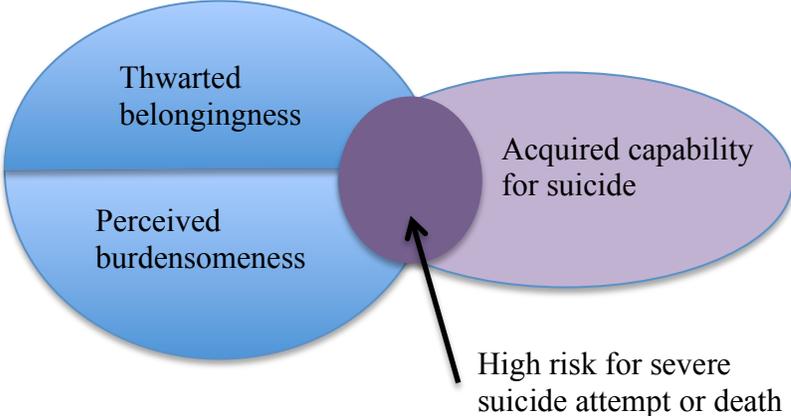


Figure 2. Thomas Joiner's Interpersonal Theory of Suicidality



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Appendices

Appendix 1. Inventory of Motivations for Suicide Attempts (IMSA)

Please take a minute to think about your most recent suicide attempt. Indicate the date of your **most recent** attempt:

_____.

Sometimes people see things differently as time passes. For the purposes of this questionnaire, we are asking about the reasons that were important for you leading up to your most recent attempt, even though you may not have the same thoughts and feelings today. As you answer these questions, try to imagine yourself back in the situation when you were considering attempting suicide and the reasons that were going through your mind at that time.

Below are some common reasons people give for attempting suicide. Please rate how **important** each of these reasons was to your most recent attempt.

	0-----	1-----	2-----	3-----	4
Not at all important	Somewhat important	Important	Very Important	Most Important	
“I attempted suicide because I...”	Response				
1. ...was so flawed I had to escape from myself.	0	1	2	3	4
2. ...was feeling hopeless.	0	1	2	3	4
3. ...had almost attempted in the days or weeks beforehand, but this time it didn't seem as scary.	0	1	2	3	4
4. ...wanted to make my family better off.	0	1	2	3	4
5. ...wanted to get help from someone.	0	1	2	3	4
6. ...lost all hope that things could get better in the future.	0	1	2	3	4
7. ...couldn't stand all the emotions in my head anymore.	0	1	2	3	4
8. ...wanted to know if someone really cared about me.	0	1	2	3	4
9. ...my state of mind was too unbearable.	0	1	2	3	4
10. ...didn't belong to any community.	0	1	2	3	4
11. ...wanted to make people sorry for the way they treated me.	0	1	2	3	4
12. ...wanted to die	0	1	2	3	4
13. ...needed to get out of an impossible situation.	0	1	2	3	4
14. ...was only dragging down those around me by staying alive.	0	1	2	3	4
15. ...needed to persuade someone to change his or her mind.	0	1	2	3	4
16. ...couldn't stand being aware of my failings anymore.	0	1	2	3	4
17. ...had thought about it for awhile and finally acted on my plan.	0	1	2	3	4
18. ...hated myself so much.	0	1	2	3	4

0-----1-----2-----3-----4
 Not at all Somewhat Important Very Most
 important important Important Important Important

“I attempted suicide because I...”

Response

	0	1	2	3	4
19. ...didn't have anyone to love.	0	1	2	3	4
20. ...needed to prevent someone from hurting me.	0	1	2	3	4
21. ...my emotions were too overwhelming to handle.	0	1	2	3	4
22. ...seemed like the best way to deal with my problems (e.g. personal, financial).	0	1	2	3	4
23. ...was so humiliated I couldn't show my face again.	0	1	2	3	4
24. ...seemed to lose control and I have no idea why I behaved that way.	0	1	2	3	4
25. ...needed to prove to myself that things were really that bad.	0	1	2	3	4
26. ...acted on impulse.	0	1	2	3	4
27. ...was so lonely I couldn't handle it.	0	1	2	3	4
28. ...needed to make other people understand how distressed I was.	0	1	2	3	4
29. ...was no longer afraid to try attempting suicide.	0	1	2	3	4
30. ...was causing too much trouble for those around me.	0	1	2	3	4
31. ...thought nobody loved me.	0	1	2	3	4
32. ...had been working myself up and this time I followed through.	0	1	2	3	4
33. ...didn't have a reason, it just happened.	0	1	2	3	4
34. ...needed to stop being a burden to others.	0	1	2	3	4
35. ...needed to stop my mental pain.	0	1	2	3	4
36. ...wanted to make others afraid.	0	1	2	3	4
37. ...my future seemed dark.	0	1	2	3	4
38. ...didn't fit in anywhere.	0	1	2	3	4
39. ...wanted to make other people feel guilty for not helping me.	0	1	2	3	4
40. ...my thoughts were too much to bear.	0	1	2	3	4
41. ...thought it could fix some important practical problems for my family/friends.	0	1	2	3	4

0-----1-----2-----3-----4
Not at all **Somewhat** **Important** **Very** **Most**
important **important** **Important** **Important**

“I attempted suicide because I...”

Response

42. ...the idea just came to me, I didn't really think about it.	0	1	2	3	4
43. ...needed to get admitted to a hospital so I could get some help.	0	1	2	3	4
44. ...didn't think things would get better, no matter what I did.	0	1	2	3	4
45. ...was the most hopeless I'd ever been.	0	1	2	3	4
46. ...could no longer tolerate my emotional pain.	0	1	2	3	4
47. ...thought so poorly of myself, dying seemed like a relief.	0	1	2	3	4
48. ...felt it would help solve some specific problems.	0	1	2	3	4
49. ...it was a spur of the moment decision.	0	1	2	3	4
50. ...was a drain on my loved ones.	0	1	2	3	4
51. ...felt disconnected from everyone in my life.	0	1	2	3	4
52. ...was less afraid of the physical pain than I used to be.	0	1	2	3	4
53. ...hoped to influence the actions of people around me.	0	1	2	3	4
54. ...wanted others to recognize how much I was hurting.	0	1	2	3	4

Please add any other reasons to the list that were not mentioned and rate how big an influence they were on you suicide attempt (0 = not at all important; 4=most important).

ITEMS ARRANGED BY SCALE

“I attempted suicide because...”

1. Hopelessness

- 2. I was feeling hopeless.
- 6. I lost all hope that things could get better in the future.
- 37. My future seemed dark.
- 44. I didn't think things would get better, no matter what I did.
- 45. I was the most hopeless I've ever been.

2. Psychache/Unbearability

- 7. I couldn't stand all the emotions in my head anymore.
- 9. My state of mind was too unbearable.
- 21. My emotions were too overwhelming to handle.
- 35. I needed to stop my mental pain.
- 46. I could no longer tolerate my emotional pain.

3. Escape

- 1. I was so flawed I had to escape from myself.
- 16. I couldn't stand being aware of my failings anymore.
- 18. I hated myself so much.
- 40. My thoughts were too much to bear.
- 47. I thought so poorly of myself that dying seemed like a relief.

4. Problem Solving

- 13. I needed to get out of an impossible situation.
- 20. I needed to prevent someone from hurting me.
- 22. It seemed like the best way to deal with my problems (e.g. personal, financial).
- 41. I thought it could fix some important practical problems for my family/friends.
- 48. I felt it would solve some specific problems.

5. Impulsivity

- 24. I seemed to lose control and I have no idea why I behaved that way.
- 26. I acted on impulse.
- 33. I didn't have a reason, it just happened.
- 42. The idea just came to me, I didn't really think about it.
- 49. It was a spur of the moment decision.

6. Burdensomeness

- 4. I wanted to make my family better off.
- 14. By staying alive, I was only dragging down those around me.
- 30. I was causing too much trouble for those around me.
- 34. I needed to stop being a burden to others.
- 50. I was a drain on my loved ones.

7. Belongingness

- 10. I didn't belong to any community.
- 19. I didn't have anyone to love.

31. I thought nobody loved me.
38. I didn't fit in anywhere.
51. I felt disconnected from everyone in my life.
8. Fearlessness/Capability
3. I had almost attempted in the days or weeks beforehand, but this time it didn't seem as scary.
17. I had thought about it for awhile and finally acted on my plan.
29. I was no longer afraid to try attempting suicide.
32. I had been working myself up and this time I followed through.
52. I was less afraid of the physical pain than I used to be.
9. Influencing Others
11. I wanted to make people sorry for the way they treated me.
15. I needed to persuade someone to change his or her mind.
36. I wanted to make others afraid.
39. I wanted to make other people feel guilty for not helping me.
53. I hoped to influence the actions of people around me.
10. Help Seeking
5. I wanted to get help from someone.
8. I wanted to know if someone really cared about me.
28. I needed to make other people understand how distressed I was.
43. I needed to get admitted to a hospital so I could get some help.
54. I wanted other to recognize how much I was hurting.
11. Other
12. I wanted to die
23. I was so humiliated I couldn't show my face again.
25. I needed to prove to myself that things were really that bad.
27. I was so lonely I couldn't handle it.