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## Descriptive and Psychometric Properties of the Inventory of Motivations for Suicide Attempts (IMSA) in an Inpatient Adolescent Sample

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### Abstract

**Objectives**—Little is known about why adolescents attempt suicide. The current study examined the endorsement, structure, and clinical correlates of adolescents' suicide attempt motivations as measured by the Inventory of Motivations for Suicide Attempts (IMSA).

**Methods**—Suicidal adolescents ( $n = 52$ ) in a psychiatric unit were administered the IMSA and interviewed about their suicide attempts.

**Results**—Psychache, Hopelessness, and Escape were the most strongly endorsed motivations, and Interpersonal Influence the least endorsed. IMSA scales exhibited a two-factor solution: 1) Internal and 2) Communication. Suicide intent was strongly correlated with Internal motivations and moderately inversely correlated with Communication motivations. Factor structure and mean endorsements were similar to adult samples.

**Conclusions**—The IMSA is a useful measure to assess attempt motivations in adolescents.

### Keywords

Suicide attempt; adolescents; motivations; reasons; measurement

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Suicide continues to be a pervasive public health problem for adolescents (Kann, Kinchen, Shanklin et al., 2014). Although our knowledge of risk factors is rich (Hawton, Saunders, & O'Connor, 2012), research on *why* adolescents attempt suicide is sparse. The only four studies of reasons for self-injurious behavior in teens have found that items reflecting escaping a situation, a state of mind, and painful feelings were most often endorsed, whereas seeking help was least endorsed (Boergers, Spirito, & Donaldson, 1998; Hawton, Cole, O'Grady, et al., 1982; Jacobson, Batejan, Kleinman, et al., 2013; Kienhorst, De Wilde, Diekstra, et al., 1995).

Two methodological concerns limit research on motivations for suicide attempts. First is the absence of a comprehensive, valid measure for assessing motivations. Variable and inadequate assessment of motivations has limited the utility and generalizability of findings. Having a comprehensive, psychometrically sound measure would improve the field's understanding of attempt motivations.

Second, none of the four studies noted above included intent to die as part of the definition of attempt; in fact, 24%–74% of each sample did not endorse wanting to die as a reason for their self-injurious behavior (Boergers et al., 1998; Hawton, et al., 1982; Kienhorst et al., 1995; Jacobson et al., 2013). Thus, findings from these studies may be confounded by the motivations reported for non-suicidal self-injurious behaviors, which can be different (and at times divergent) compared to suicide (Klonsky & Glenn, 2009; Baetens, Claes, & Muehlenkamp, 2011). Studying suicide attempt motivations requires verifying intent to die among participants.

Hawton et al (1982) illustrates an essential reason for developing and using measures of motivations for attempts. In this study, clinicians were asked to complete the same questionnaires as their adolescent clients. Clinicians tended to underestimate intent to die and over estimate the communicative or interpersonal motivations for the attempt, compared to the adolescents' self-reports. A gap between the adolescents' experiences and their clinicians' perspectives could be harmful to prevention and intervention practices, as well as patient-client rapport. Research on *why* adolescents attempt suicide can help remedy this gap.

This need for a psychometrically sound measure of suicide motivations, useful for both clinical and research settings and with items rooted in prevailing theories of suicidology, led to the development of the Inventory of Motivations for Suicide Attempts (IMSA; May & Klonsky, 2013). This study identified a reliable 2-factor structure for IMSA scales, supported the IMSA's convergent and divergent validity, and identified key relationships between motivations and attempt characteristics, such as intent to die. Whereas this study focused on samples of adults, the present study examines the IMSA in adolescent inpatients with recent suicide attempts.

The goals of the present study are to 1) describe the motivations adolescents endorse for their suicide attempts, 2) establish the structure of the IMSA scales in adolescents using exploratory factor analysis (EFA), and 3) compare the endorsement pattern and factor structure for this sample with the results from the original validation sample of adult attempters.

## Methods

### Procedures

**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 (85% female) ranged from 12–17 years of age with a mean of 14.8 ( $SD = 1.4$ ). Regarding race and ethnicity, 65% identified themselves as White, 14% as Hispanic or Latino/a, 14% as multiracial, 4% as African American and 4% declined to answer. Suicidal ideation onset occurred at mean age 12.0 ( $SD = 2.3$ ). Most reported only one suicide attempt (67%). 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.

Data for the current study were drawn from ongoing clinical trials with suicidal adolescents admitted to two psychiatric inpatient units in the Northeastern United States. Participants completed an interview assessing lifetime suicide attempts. Those reporting a suicide attempt history were administered the IMSA in reference to their most recent attempt.

**Measures**—The *Inventory of Motivations for Suicide Attempts* (IMSA) is a self-report questionnaire that assesses motivations for suicide attempts emphasized by major theories of suicide. The development and validity of the IMSA in a sample of adult attempters has been previously reported (see May & Klonsky, 2013). The IMSA consists of ten 5-item scales, as well as four additional items. Items begin with the stem “I attempted suicide because I...” and 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* interview (C-SSRS; Posner, Brown, Stanley et al., 2011) was used to assess for the occurrence of suicide attempts as defined by this study. The C-SSRS has been found to have good reliability and validity among adolescent suicide attempters (Posner et al., 2011).

## Results

### Data Preparation

Data were examined for missing values and outliers. 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 three instances across 520 scale scores calculated. Data were not used for one participant who skipped more than one item on a scale. One participant was excluded because she scored over 4 standard deviations above the mean on a scale. Thus, 50 participants were included in the analyses.

### Characteristics of Suicide Attempts

Participants were assessed a median of 2 weeks after their most recent suicide attempt (*IQR* = 1–16 weeks). The most common methods of attempt were overdose (64%) and cutting/stabbing (15%). Attempts generally resulted in minor physical damage as measured by the C-SSRS (e.g., mild bleeding, lethargic speech) ( $M = 1.3$ ,  $SD = 1.3$ , range = 0–4).

### Descriptive Statistics and Internal Consistency

Mean endorsement and internal consistency are reported for the 10 scales (Table 1). Psychache, Hopelessness, and Escape were the three most strongly endorsed motivations, while Interpersonal Influence was the least endorsed. Three scales were rated as at least “important” by almost all participants: Hopelessness (98%), Psychache (90%), and Escape (90%). Nine scales had coefficient alphas greater than .70 (Nunnally & Bernstein, 1994). 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 previous data (May & Klonsky, 2013). This scale was dropped from the factor analysis.

### Factor Structure

EFA of the IMSA scales was conducted with principle axis factoring and promax rotation. Nine scales were entered into the factor analysis. Bartlett's test of sphericity was significant and the KMO statistic suggested good sampling adequacy (.81).

Examination of eigenvalues and scree plots revealed a 2-factor structure, equivalent to the factor structure in the original validation sample (Table 2). The first factor (accounting for 46% of the variance; eigenvalue = 4.1) was consistent with the Internal1 factor identified in the original factor analysis of the IMSA (May & Klonsky, 2013). The following six scales loaded cleanly (loadings greater than .40) on 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 Communication2 factor identified previously. The following scales loaded cleanly on the second factor: Interpersonal Influence and Help-Seeking. As in the original validation sample, 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 factor and a Communication factor. Coefficient alpha for the Internal factor was .89 and the Spearman-Brown reliability coefficient for the Communication factor was .69. The Internal and Communication factors were not correlated with each other ( $r = .07$ ), supporting the distinct identity of each factor.

### Intent

Exploratory analyses were conducted to investigate relationships between the IMSA factors and intent, as indexed by greater endorsement of "desire to die". Intent was strongly correlated with Internal motivations ( $r = .67, p < .001$ ) and not correlated with Communication motivations ( $r_s = -.19, p = .20$ ).

### Comparing IMSA Scale Properties between Adolescents and Adults

Results from the current sample were compared with those from the original IMSA psychometric paper (May & Klonsky, 2013). The original sample consisted of 119 undergraduates and outpatients with recent suicide attempts. Scale reliabilities were similar between the adolescents and adults, including the low reliability of the Problem-Solving scale. The mean endorsement of each scale was also compared across the two samples using independent samples *t*-tests. Psychache, Hopelessness, and Escape were the most strongly endorsed scales in both samples and Interpersonal Influence was the least endorsed in both samples. Of the ten scales, only two differed significantly between the groups.

<sup>1</sup>This factor was referred to as "Intrapersonal" in the original IMSA psychometrics publication (May & Klonsky, 2013). The factor was renamed to better represent the content of the scales that contribute to it and for linguistic simplicity. The scales loading on the factor are identical.

<sup>2</sup>This factor was referred to as "Interpersonal" in the original IMSA psychometrics publication (May & Klonsky, 2013). The factor was renamed to better represent the content of the scales that contribute to it and for linguistic simplicity. The scales loading on the factor are identical.

Burdensomeness was more strongly endorsed by the adolescent inpatients ( $\kappa(166) = -2.39$ ,  $p = .02$ ;  $d = .40$ ) and Interpersonal Influence by adults ( $\kappa(154.9) = 4.20$ ,  $p < .001$ ;  $d = .57$ ).

## Discussion

The main motivations adolescents endorsed for their suicide attempts reflect the experience of extreme emotional pain (Psychache), disbelief that it would get better (Hopelessness), and a perceived solution to this intractable problem (Escape). This is contrary to a common misperception that adolescents attempt suicide for attention or to communicate with others (Hawton et al., 1982), as these motivations were endorsed by few participants.

An EFA revealed a two-factor structure of IMSA scales: the Internal factor consisted of six scales describing intrapersonal motivations, while the Communication factor consisted of two scales reflecting interpersonal motivations. These factors were differentially related to intent to die. Greater intent was strongly related to endorsing more Internal motivations. Perhaps this pattern suggests that adolescents who attempt only due to misery and hopelessness see suicide as their only escape, whereas adolescents who attempt in part as a method of communication have more hope that something may help them. However, it is important to note that adolescents tend to be poor predictors of the lethality of their methods (Sapyta, Goldston, Erkanli et al., 2012) and often choose methods that are inconsistent with their degree of intent to die; thus, even attempts motivated by communication and low in stated intent to die must be taken seriously.

Attempt motivations were strikingly similar across adolescent and adult samples. In fact, the only substantial differences in mean endorsement patterns were that Burdensomeness was more strongly endorsed by adolescents and Interpersonal Influence by adults. During adolescence it is normative for youth to be developing autonomy (Erikson, 1968; Wray-Lake, Crouter, & McHale, 2010). Adolescents struggling with separating from their parents, perhaps due to mental health concerns, may feel a greater sense of burdensomeness. Interpersonal influence motivations resonated less with inpatient adolescents than undergraduates and outpatient adults. It is possible that, young adults think less about the interpersonal consequences of their attempts, and are thus less likely to be motivated to attempt for such reasons. Alternatively, the two differences in motivations may be because adolescents were assessed just days after their attempt whereas the adults were assessed a year or two after. Perhaps more temporal distance from the attempt leads feelings of burdensomeness to be less salient, but makes it easier to report interpersonal motivations. Further study is needed to clarify whether there are age differences in attempt motivations.

Overall, the IMSA's structure and functioning were markedly similar across different populations, suggesting there are common motivations across individuals who attempt suicide and that the IMSA can capture these motivations reliably across different groups. However, some features of this study limit the conclusions we can draw. Replication will be essential to conclusively demonstrate the factor structure of the IMSA among adolescents, particularly due to our small sample size. Furthermore, a larger sample would allow for an item- rather than scale-level analysis of the IMSA. Additionally, due to the predominately

female sample, results may not generalize to males. Finally, suicide deaths were not examined, limiting generalizability to suicide death.

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**Table 1**

Means, Ranges, and Internal Consistency for IMSA scales

	<i>Alpha</i>	<i>Mean (SD)</i>	<i>Range</i>
Psychache	.90	15.4 (4.5)	2–20
Hopelessness	.79	14.8 (4.1)	5–20
Escape	.83	14.2 (4.7)	3–20
Burden	.89	10.3 (6.1)	0–20
Low Belongingness	.79	9.3 (5.6)	0–20
Fearlessness	.85	8.1 (5.9)	0–20
Problem-Solving	.65	8.0 (4.6)	0–18
Impulsivity	.79	6.5 (5.1)	0–18
Help-Seeking	.79	4.5 (4.6)	0–16
Interpersonal Influence	.75	1.7 (3.0)	0–12

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**Table 2**

Pattern matrix with a 2-factor solution

	<b>Internal Motivations</b>	<b>Communication Motivations</b>
Psychache	<b>.73</b>	.05
Hopelessness	<b>.85</b>	-.03
Escape	<b>.92</b>	-.20
Burdensomeness	<b>.65</b>	.04
Low Belongingness	<b>.75</b>	.26
Fearlessness	<b>.73</b>	.00
Impulsivity	.11	.31
Interpersonal Influence	.01	<b>.68</b>
Help-Seeking	-.07	<b>.79</b>

Note: Factor loadings greater than .40 are bolded.

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