The Modified Scale for Suicidal Ideation: Factors of Suicidality and Their Relation to Clinical and Diagnostic Variables

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The authors conducted the 1st large-sample factor-analytic study of the Modified Scale for Suicidal Ideation (MSSI; I. W. Miller, W. H. Norman, S. B. Bishop, & M. G. Dow, 1986) on a sample of 330 suicidal young adults. Factor analyses revealed 2 MSSI factors: Suicidal Desire and Ideation (ongoing thoughts or desires about suicide) and Resolved Plans and Preparation (intense thoughts, plans, and courage and capability to commit suicide). The Resolved Plans and Preparation factor was more related to Attempt versus Ideator status than was the Suicidal Desire and Ideation factor. The Suicidal Desire and Ideation factor was more highly related to depressotypic indicators than was the other factor, suggesting that level of depression, although predictive of ideation, may not be as strong a correlate of preparation. Comparison of depression- and anxiety-related diagnostic groups on the MSSI factors revealed little difference, consistent with previous work highlighting the occurrence of suicidality across diagnostic groups. These findings have implications for the structure of suicidality, as well as its clinical assessment.

Beck, Kovacs, and Weissman (1979) developed the Scale for Suicidal Ideation, a semistructured, clinician-rated measure of suicidality. Although Beck et al. provided some initial reliability and validity data, an essential piece of the scale's construct validity regarding its factorial structure was not fully assessed. In an exploratory analysis, Beck et al. found three factors: Active Suicidal Desire, Passive Suicidal Desire, and Suicidal Behavior.

Using a self-report version of the scale, Steer, Rissmiller, Ranieri, and Beck (1993) reported a slightly different structure, again using an exploratory approach. These authors identified the following factors: Desire for Death, Active Suicidal Desire, and Preparation for Suicide (cf. Beck, Kovacs, & Weissman's [1979] Suicidal Behavior). Although the Steer et al. and Beck, Kovacs, and Weissman studies assigned similar labels to the three factors, there was substantial variability regarding which items comprised which factor (e.g., wish to die loaded on Active Suicidal Desire in the Beck, Kovacs, & Weissman study, but in the Steer et al. study, wish to die loaded on the Wish for Death factor).

Miller, Norman, Bishop, and Dow (1986) provided a revision of the original scale (Modified Scale for Suicidal Ideation; MSSI), along with convincing reliability and construct validity data (e.g., reliability estimates in the .90s, convergence with other measures of suicidality). However, as with the original version, factorial validity data were, to our knowledge, lacking. The only exception is a study by Clum and Yang (1991) on 91 college students who experienced suicidal ideation. Clum and Yang reported three MSSI factors: Suicidal Desire, Preparation for Attempt, and Perceived Capability of Making an Attempt.

The present study was designed to assess the factorial structure of the MSSI among a large clinical sample. Lack of such data represents an important gap in the literature on this useful tool. In so doing, we have not only provided essential psychometric validity data for a specific instrument, but have also obtained data on the general structure of suicidality and on the clinical and diagnostic correlates of suicidality factors (i.e., depression, hopelessness, life events, problem-solving style, diagnostic status, ideator vs. attempter status).

Method

Participants

Participants included 330 (271 male, 59 female) individuals, evaluated at intake prior to entry into a study on the efficacy of a time-limited, problem-solving treatment for suicidal young adults (Rudd et al., 1996). Participants were referred from two outpatient clinics, a 20-bed inpatient facility, and an emergency room, all affiliated with a major U.S. army medical center.

Mean age for the total sample was 22 (SD = 2.3 years). The gender
distribution (82% male, 18% female) is common in military medical settings. Most participants were Caucasian (n = 198 or 60%); 26% were African American; 11% were Hispanic; 2% were Native American; 1% were Asian or Pacific Islander; and 1% were classified as other. As would be expected, mood disorders were the most common diagnoses.

Procedures
Testing and diagnostic interviews were conducted by clinical staff (two licensed doctoral-level psychologists, three licensed masters-level professionals, and one advanced-level doctoral student) prior to entry into the treatment study. All staff were thoroughly trained and carefully monitored.

Measures
Our main focus was on the MSSI and its factors. To further assess the MSSI factors and their relations to other variables, the study also included several other clinical and diagnostic measures.

Modified Scale for Suicidal Ideation. (Miller et al., 1986). The MSSI is an 18-item scale that is a modified version of Beck, Kovak, & Weissman's (1979) Scale for Suicidal Ideation. The MSSI contains 13 items from the original version, plus 5 new items, and is designed as a semi-structured interview to be administered by paraprofessionals. The MSSI assesses suicidal symptoms over the past year. The first 4 items have been designated as screening items to identify those whose suicidal ideation is severe enough to warrant administration of the entire scale. All participants in our sample were administered the entire scale, as all experienced clinically significant levels of suicidality (thus their referral to the study). Each MSSI item is rated on a scale ranging from 0 to 3; overall scale scores thus may range from 0 to 54. All items are keyed such that higher scores represent more suicidality. Miller et al. (1986) have reported reliability coefficients (e.g., coefficient α = .94) and construct validity data. In the current sample, MSSI M = 23.48, SD = 10.23, α = .88.

Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974). The BHS includes 20 true–false items that tap the general construct of hopelessness (e.g., "My future seems dark to me."). Among others, Metalsky and Joiner (1992) reported reliability and validity data for the BHS. In the current sample, BHS mean = 8.77, SD = 6.34, Kuder-Richardson 20 reliability estimate = .94.

Beck Depression Inventory (BDI; Beck, Rush, Shav, & Emery, 1979). Depression level was assessed by the BDI, a 21-item self-report inventory of depressive symptoms (see Beck, Steer, & Garbin, 1988, for review of psychometric and validity data). In the current sample, BDI mean = 15.63, SD = 11.83, α = .92.

Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978). The LES is a 57-item self-report measure of the occurrence of life stress (Sarason et al., 1978, reported psychometric data). For each item, respondents indicated the degree of positive and negative impact, on 4-point scales (ranging from 0 to 3). We focused on the Negative Events subscale. The time period targeted by the LES in our study was the past year. In the current sample, LES mean was 18.90 (SD = 11.74).

Problem-Solving Inventory (PSI, Form B; Hepper, 1988). The PSI is a 32-item self-report measure of problem-solving behaviors and attitudes (see Hepper, 1988, for reliability and validity data). The total PSI score was used in this study. PSI items were rated on a scale ranging from 1 to 6. In our sample, the PSI M was 108.64 (SD = 25.58, α = .93).

Diagnoses. Current diagnoses were assigned by using a computerized version of the National Institute of Mental Health Diagnostic Interview Schedule (the third revised Diagnostic and Statistical Manual of Mental Disorders version, American Psychiatric Association, 1987). (See Blount, Perez, & Blount, 1988, for reliability data on computerized Diagnostic Interview Schedule.)

Many participants obtained diagnoses of major depression (n = 128); several obtained diagnoses of dysthymia (n = 8); depressive disorder not otherwise specified (n = 19); double depression (i.e., major depression superimposed on dysthymia; n = 6); anxiety disorder (i.e., any anxiety disorder as the primary diagnosis; n = 10); and comorbid depression and anxiety (i.e., any depressive disorder together with any anxiety disorder; n = 7), as well as several other diagnoses (e.g., personality disorders, substance use disorders).

Factor Analytic Strategy
Initially, participants were randomly split into two subsamples, and the MSSI was factor analyzed in each subsample. Then, convergence of factor structure between the two subsamples was formally assessed by using the coefficient of congruence and the salient variable similarity index (see Castell, 1978). The between-group factor structure was highly congruent (e.g., average coefficient of congruence was .94, average salient variable similarity index = .92); accordingly, the subsamples were combined. Analyses on the combined sample were conducted by using principal-components analysis (PCA; a highly similar pattern of results emerged using principal axis factoring). We chose an oblique rotation procedure (Oblimin), consistent with our expectation that the factors may be correlated. Items with loadings of .30 or greater on a given factor were viewed as indicators of that factor.

Standard criteria for the retention of factors were used as follows: (a) Kaiser's criterion to retain factors with eigenvalues of the unrotated solution greater than one, (b) a scree test, and (c) the interpretability of resulting factor structures, which involves examining solutions with different extraction criteria to determine the point at which trivial or redundant factors emerge (Gorsuch, 1983).

Results
The oblique PCA produced five factors with unrotated eigenvalues greater than one (eigenvalues; 6.49, 3.37, 1.44, 1.31, and 1.01). A fairly clear scree occurred after the second factor, and, insofar as the third through fifth factors were either redundant with the first two or were trivial and difficult to interpret, we opted for a two-factor solution. The two factors accounted for 55% of the MSSI items’ variance.

The results of the PCA extracting two factors are displayed in Table 1. As can be seen there, the two factors were labeled Suicidal Desire and Ideation and Resolved Plans and Preparation.

The Suicidal Desire and Ideation factor reflects desire for death, frequent suicidal ideation, few deterrents, and expectation and talk of suicide. It is also interesting to note that the factor did not reflect intensity of suicidal ideation, planning, courage or competence to attempt, and availability or opportunity. The factor thus is comprised of items that tap ongoing thoughts, ideas, and desires regarding suicide (perhaps chronic, less acute...
suicidal ideation), but not of items reflecting intense ideation or readiness to commit suicide.

The Resolved Plans and Preparation factor included items that reflect a developed plan, intense suicidal ideation, and a sense of courage, competence, and availability of means to commit suicide. Those who endorse the items on this factor may experience more intense and acute forms of suicidality, and the foreboding tone of the items highlights the possibility that they may be at substantial risk for impending suicide attempt. It is very interesting to note that the two items regarding written suicide note (e.g., keeping a journal) may not be a pernicious indicator that an attempt is imminent, and may, in fact, be protective.

Despite the oblique rotation procedure, the factors were not highly intercorrelated (r = .03; but see below). This suggests that the two factors represent relatively distinct facets of suicidality.

We computed alpha internal consistency coefficients for two subscales based on the two factors. These subscales were formed by simply adding respective items for each factor. For the Suicidal Desire and Ideation composite, MSSI Items 1 through 4, 6, 8, 9, 14, and 15 were summed; for the Resolved Plans and Preparation composite, MSSI Items 5, 7, 10 through 13, and 16 (reversed) were summed. Items 17 and 18 did not clearly load on one factor, and thus were not assigned. The correlation between these composites was higher than the factor intercorrelation (r = .52, p < .01); nonetheless, reasonable discriminability between the factors remained. Reliability coefficients were .88 and .79, respectively.

To summarize, our factor analyses revealed two interpretable, discriminable, and replicable factors: Suicidal Desire and Ideation and Resolved Plans and Preparation. The factors possessed good psychometric properties. Next, we determined whether these factors display differential patterns of relations to clinical and diagnostic indices.

### Clinical Correlates of the Two Factors

Because globally negative ideation, including but not limited to suicidal ideation, is a pervasive feature of depression more so than of other syndromes, we surmised that the Suicidal Desire and Ideation factor may be more correlated with depressotypic indicators than would the Resolved Plans and Preparation factor. Regarding other indices (life events, problem solving), we took an exploratory approach.

Table 2 displays the correlations of the two MSSI factors with the BDI, BHS, Life Events, and Problem-Solving measures. Consistent with our expectations, the BDI2 and BHS correlated more strongly with the Suicidal Desire and Ideation factor than with the Resolved Plans and Preparation composite, according to the t test for significance of difference between dependent correlations (Cohen & Cohen, 1983, p. 53–54). The results regarding the LES were similar, if somewhat less pronounced.

It was interesting that the LES correlated similarly with the Suicidal Desire and Ideation and the Resolved Plans and Preparation factors, (r = .22 for Suicidal Desire and Ideation, r = .26 for Resolved Plans and Preparation). 2 The results is interesting for another reason: It is inconsistent with the possibility that the MSSI factor with merely the most reliability or variance correlates more strongly with all other variables.

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2 The analyses with the BDI were also conducted excluding the BDI suicide item. The correlations were virtually identical to those presented in text.
The two MSSI factors displayed a differential pattern of relations to some variables, but not to others. Perhaps most important, and as might be expected, the Resolved Plans and Preparation factor was more related to Attempt versus Ideator status than was the Suicidal Desire and Ideation factor. This finding...

Table 2
Modified Scale for Suicidal Ideation Factors in Relation to Clinical and Diagnostic Variables

<table>
<thead>
<tr>
<th>Measure</th>
<th>Suicidal desire</th>
<th>Resolved plans</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BDI</td>
<td>.44</td>
<td>.28</td>
<td>3.27**</td>
</tr>
<tr>
<td>BHS</td>
<td>.49</td>
<td>.32</td>
<td>3.61**</td>
</tr>
<tr>
<td>LES</td>
<td>.22</td>
<td>.26</td>
<td>&lt;1.0</td>
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<tr>
<td>PSI-T</td>
<td>.37</td>
<td>.25</td>
<td>2.39**</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>MDD (n = 128)</td>
<td>12.5</td>
<td>6.0</td>
<td>13.5</td>
</tr>
<tr>
<td>Dysthymia (n = 8)</td>
<td>12.4</td>
<td>5.8</td>
<td>13.5</td>
</tr>
<tr>
<td>DD-NOS (n = 19)</td>
<td>9.7</td>
<td>4.1</td>
<td>13.5</td>
</tr>
<tr>
<td>Double depression (n = 6)</td>
<td>16.0</td>
<td>4.2</td>
<td>14.7</td>
</tr>
<tr>
<td>Anxiety (n = 10)</td>
<td>14.1</td>
<td>5.4</td>
<td>15.5</td>
</tr>
<tr>
<td>Anxiety/depression (n = 7)</td>
<td>12.9</td>
<td>7.4</td>
<td>15.3</td>
</tr>
</tbody>
</table>

Note. BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; LES = Negative Life Events; PSI-T = Problem-Solving Inventory—total score; MDD = major depressive disorder; DD-NOS = Depressive disorder not otherwise specified.

**p < .01.

Partial correlations between each factor and the BDI, BHS, PSI, and LES revealed a similar pattern. The partial correlation between Suicidal Desire and Ideation and the BDI, controlling for the Resolved Plans and Preparation factor, was .36, r(326) = 6.91, p < .01, whereas the partial correlation between Resolved Plans and Preparation and the BDI, controlling for Suicidal Desire and Ideation, was .06, r(326) = 1.13, p = ns. A similar situation obtained for the BHS and the PSI, but not for the LES, very similar to the results reported in Table 2.

In summary, the Suicidal Desire and Ideation factor was more highly correlated with depression, hopelessness, and problem solving than the Resolved Plans and Preparation factor. Suicidal Desire and Ideation and Resolved Plans and Preparation displayed similar relations to negative life events.

MSSI Factors’ Relations to Diagnoses of Depression and Anxiety

In light of recent work emphasizing the clinical severity of double depression (e.g., Sanderson, Wetzler, Beck, & Betz, 1992), as well as the relation of anxiety to suicidality (e.g., Busch, Clark, Fawcett, & Kravitz, 1993), it is of interest to consider the two MSSI factors among participants with one of the six diagnoses described in the Method section. These six diagnostic groups did not differ to a statistically significant degree on either of the MSSI factors (multivariate analysis of variance [MANOVA] F and univariate Fs < 1.50, ps = ns). Means and standard deviations for Suicidal Desire and Ideation and Resolved Plans and Preparation per each group are displayed in Table 2.

Again, the MANOVA did not indicate significant between-group differences. Still, it is interesting to note that on both MSSI factors, scores were (nonsignificantly) higher among anxiety disordered participants and those with double depression.
supplies a compelling piece of criterion validity data for the MSSI factors. Furthermore, it highlights a potential clinical implication of our findings—that the Resolved Plans and Preparation factor may be quite important in assessing suicide risk, perhaps more so than the Suicidal Desire and Ideation factor. Insofar as our study did not assess risk for future suicidality, we encourage future research to evaluate the utility of the MSSI factors in assessing suicide potential.

It is interesting to note that the Suicidal Desire and Ideation factor was more highly related to depressotypic indicators (e.g., depressive symptoms, hopelessness) than was the Resolved Plans and Preparation factor. Because negative ideation, including but not limited to suicidal ideation, characterizes depression perhaps more so than other syndromes, it is not surprising that the ideation-related factor was correlated with depression indices. In this context, it is interesting to note that the preparation-related factor was not highly related to these variables, suggesting that level of depression, while predictive of ideation, may not be a strong correlate of preparation.

In a related vein, the comparison of depressed versus anxious diagnostic groups on the two MSSI factors revealed little difference. This analysis must be interpreted cautiously because of low numbers in some groups. The finding that MSSI factor scores were (nonsignificantly) higher among anxiety disordered participants is consistent with others (e.g., Busch et al., 1993) and highlights the occurrence of suicidality across diagnostic groups.

The relation of our study to past factor-analytic work on suicidality deserves consideration. First, Steer, Beck, and colleagues (e.g., Steer et al., 1993) have emphasized the distinction between active and passive suicidal desire. This distinction did not emerge in our analyses; the passive desire item loaded strongly, along with active desire items, onto a general desire factor. We agree that the active versus passive distinction is intuitive and of potential utility, yet did not obtain empirical support for it; and neither did Clum and Yang (1995) in their study of the MSSI. It would be interesting for future work to address this problem: If the distinction is valid, it should consistently emerge in factor analytic work.

Second, Clum and Yang (1995), in their investigation of the MSSI, found that our Resolved Plans and Preparation factor may be subdivided into two factors, Preparation for Attempt and Perceived Capability to Make an Attempt. This is an interesting distinction, which reflects the fact that although preparation implies capability, capability may not imply preparation. The distinction is undercut by its absence from our study on a large clinical sample, but nonetheless deserves continued research and clinical attention.

Third, like Clum and Yang (1995), our study focused on Miller et al.'s (1986) MSSI; other studies used Beck, Kovacs, and Weissman's (1979) original version or Beck, Steer, and Ranieri's (1988) self-report version of the original. There are some important differences between the MSSI and the Beck, Kovacs, and Weissman's (1979) version. Specifically, the MSSI added items related to intensity of ideation, courage and competence to attempt, and talk and writing of death (note that Beck, Steer, and Ranieri's 1988 self-report version includes similar items). These additional items proved to be quite important in our factor analyses. Intensity of ideation, as well as courage or competence to attempt, were strong indicators of our Resolved Plans and Preparation factor. Accordingly, we recommend use of scales, such as the MSSI and Beck, Steer, and Ranieri's (1988) self-report inventory, that assess these key indicators.

In closing, we reiterate some particular strengths and limitations of our study. First, our sample was large and included people experiencing clinically severe forms of suicidality. Our findings should, however, be interpreted with the caution in mind that the sample was primarily male and from a military setting. We look forward to future work that assesses the generalizability of our results. Second, our data have implications not only for the properties of the MSSI, but for the structure of suicidality itself. However, as with any factor-analytic study, the content of our measure constrained potential results regarding the structure of the construct. Third, we have gone beyond the MSSI's factor structure, which is important in itself, to examine the factors' relations to clinical and diagnostic variables of interest. Implications for the assessment of suicidality emerged, but should be interpreted with the study's limitations in mind. In general, then, within the study's constraints, we have provided new and important findings on the MSSI's structure, on the structure of suicidality, and on the relation of suicide factors to clinical and diagnostic indicators and have elucidated the potential implications of our results for clinical assessment of suicidal patients.

References
FACTORS OF SUICIDALITY


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