

# Research Article

## AN INVESTIGATION OF THE INTERACTIVE EFFECTS OF THE CAPABILITY FOR SUICIDE AND ACUTE AGITATION ON SUICIDALITY IN A MILITARY SAMPLE

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**Background:** According to the interpersonal theory of suicide (1, 2), the difficulties inherently associated with death by suicide deter many individuals from engaging in suicidal behavior. Consistent with the notion that suicide is fear-some, acute states of heightened arousal are commonly observed in individuals immediately prior to lethal and near-lethal suicidal behavior. We suggest that among individuals who possess elevated levels of the capability for suicide, the heightened state of arousal experienced during periods of acute agitation may facilitate suicidal behavior in part because it would provide the necessary energy to approach a potentially lethal stimulus. Among individuals who are low on capability, the arousal experienced during agitation may result in further avoidance.

**Methods:** In the present project we examine how acute agitation may interact with the capability for suicide to predict suicidality in a large military sample ( $n = 1,208$ ) using hierarchical multiple regression. **Results:** Results were in line with a priori hypotheses: among individuals high on capability, as agitation increases, suicidality increases whereas as agitation increases among individuals low on capability, suicidality decreases. Results held beyond the effects of thwarted belongingness, perceived burdensomeness, and suicidal cognitions. **Conclusions:** Beyond further substantiating the link between agitation and suicide, findings of the present study provide evidence for the construct validity of the acquired capability as well as offer initial evidence for moderating role of capability on the effect of agitation on suicide. Limitations of the current study highlight a need for future research that improves upon the techniques used in the present study. Implications for science and practice are discussed. *Depression and Anxiety* 00:1–7, 2014. © 2014 Wiley Periodicals, Inc.

**Key words:** agitation; capability for suicide; suicide; suicidal behavior; interpersonal theory of suicide

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## INTRODUCTION

Suicide is a leading cause of death worldwide.<sup>[1]</sup> Yet, it remains relatively rare. Suicidal thoughts are more common;<sup>[2]</sup> however, even among individuals who desire suicide, very few will attempt suicide and most attempts will not be lethal.<sup>[2]</sup> Many existing suicide theories rest assume that stronger suicidal desire is what differentiates individuals who die by suicide from those who have suicidal thoughts but do not die. Consequently, these theories have focused on identifying the precursors of suicidal desire. By contrast, the interpersonal theory of suicide<sup>[3,4]</sup> suggests that suicidal desire is necessary but not sufficient for lethal suicidal behavior—an individual must also have developed the capability for suicide.

According to the interpersonal theory, the inherent difficulties of suicide deter many individuals from engaging in suicidal behavior. One daunting aspect is that suicide is fearsome as it requires overcoming strong, evolutionarily based self-preservation instincts. A second deterring factor is that lethal suicidal behavior is also often physically painful. The theory suggests those who have acquired the capability for suicide, therefore, will evidence a sense of fearlessness about pain, injury, and death and elevated pain tolerance.

Along with the capability for suicide, an individual must also evidence the desire to die. Desire, per the theory, occurs when two interpersonal states—namely, thwarted belongingness and perceived burdensomeness—are experienced simultaneously and perceived as global and unchanging. Thwarted belongingness is characterized by a sense of loneliness and actual or perceived social disconnection. Perceptions of being a burden to others and the belief that one's death may be worth more to others than one's life characterizes perceived burdensomeness. A growing empirical literature largely supports the main propositions of the theory (see Van Orden et al., 2010 for a comprehensive review).

Consistent with the interpersonal theory's view that suicidal behavior is fearsome, evidence indicates that heightened arousal states are commonly observed in individuals immediately prior to lethal and near-lethal suicidal behavior. One particular state of acute and heightened arousal is acute agitation, which is a time-limited state of both psychological and behavioral overarousal often characterized by restless and/or repetitive behaviors coupled with expressions of emotional turmoil and/or mental anguish or unrest.<sup>[5-7]</sup>

Bolstering expert consensus identifying agitation as a warning sign for suicide,<sup>[8]</sup> empirical evidence also supports its role in imminent suicidal behavior. In a set of psychological autopsies by Robins (1981), for instance, "nervousness" occurred in 60% of suicide decedents prior to their deaths; "tension" occurred in over 40%.<sup>[9]</sup> Retrospective studies of inpatient<sup>[10]</sup> and inmate<sup>[11]</sup> suicides report rates close to 80% in the weeks before the death. Agitation has also been linked to suicidal behavior prospectively. One large longitudinal study of depressed

patients identified agitation as one of the strongest predictors of near-term suicide.<sup>[12]</sup> Acute agitation has also been documented as a precursor of near-lethal attempts. Hall et al. (1999) reported that about 90% of emergency room patients admitted following an attempt reported experiencing "severe psychic anxiety" during the month preceding the attempt; close to 80% endorsed panic attacks.<sup>[13]</sup><sup>1</sup>

When considered further through the perspective of the interpersonal theory of suicide, the emergence of heightened arousal states, like agitation, immediately preceding suicidal behavior may be related to the fearsome nature of suicide. For most individuals, the prospect of engaging in potentially lethal suicidal behavior in the close future will naturally elicit some degree of arousal, as it requires directly confronting an imminent threat to survival. The effects of the heightened arousal experienced, however, may be influenced by an individual's capability levels. Among individuals who are low on capability, the arousal experienced during agitation may promote further avoidance. Among individuals high on capability, the arousal may facilitate suicidal behavior in part because it would provide the necessary energy to approach a potentially lethal stimulus. A robust literature exists supporting the notion that states of heightened arousal lead individuals to react with their most dominant response.<sup>[15,16]</sup>

Alternate theories may suggest that agitation is so distressing that it will result in using suicide to escape the distress—a view consistent with Psychache Theory<sup>[17,18]</sup> and Escape Theory.<sup>[19]</sup> The interpersonal theory suggests agitation is not causal but instead a byproduct of suicide's daunting nature. Although the experiencing agitation may amplify distress, it is not sufficient to predict suicide. Should the alternate view hold true, arousal alone would be expected to increase suicidality. The interpersonal theory suggests that heightened arousal states will only result in suicidal behavior among suicidal individuals high on capability for suicide—among those who lack the requisite levels of capability, arousal will likely serve to deter them from engaging in suicidal behavior as increased arousal might increase avoidance of potentially lethal stimuli. Notably, although there is an existing literature supporting a direct relationship between agitation and suicidal behavior, the majority has been conducted among suicide attempters or decedents. As past suicidal behavior increases capability, samples were likely comprised of individuals with heightened capability for suicide. In such enriched samples, we would expect a main effect of arousal on suicidal behavior.

<sup>1</sup>It is possible that individuals may be mistakenly identifying symptoms of agitation as panic or other anxiety symptoms. Although agitation and anxiety share features of heightened physiological arousal and mental preoccupation, they are distinct. Whereas anxiety is characterized by future-oriented cognitions that prepare an individual for an anticipated negative event<sup>[14]</sup>, agitation is more focused on immediate experience of physical and psychological unrest.

In the present project, we examine the hypothesis that agitation may interact with the capability for suicide to differentially predict suicide risk in a large military sample, beyond the effects of other risk factors of suicidal ideation. We expect that elevated levels of agitation will be particularly dangerous for individuals who evidence high levels of capability for suicide.

## METHOD

### PARTICIPANTS AND SETTING

Participants included in the study were new Soldiers attending the Army Recruiting Course at The Recruiting and Retention School (RRS) at Fort Jackson, SC. Recent figures indicate that Army recruiters are a group within the military that may be particularly vulnerable to suicide.<sup>[20]</sup> All participants were provided informed consent prior to participation. No compensation was given for participation. Assessments were provided at orientation as part of a larger orientation survey.

The sample consisted of 1,208 Army recruiters. The sample was predominantly male (91.7%). Although the overrepresentation of males in this sample may raise some concerns about the generalizability of findings, use of a predominantly male sample squares well with the fact that males are at significantly higher risk of death by suicide. The sample's ethnic/racial breakdown was: 66.0% Caucasian, 14.1% Black/African American, 12.9% Hispanic/Latino, 2.2% Asian, 1.6% Native Hawaiian/Pacific Islander, 1.2% American Indian/Alaskan Native and 1.7% chose not to respond. About 12% of the participants identified as single and never married, 1.2% as engaged, 77.4% as married, 7.6% as divorced, and 1.4% chose not to respond. Ages ranged from 21 to 57 with a mean of 30.00 (standard deviation = 4.93).

### MEASURES

**Acquired Capability for Suicide Scale (ACSS)<sup>[21]</sup>.** The ACSS was an abbreviated version comprised of four items assessing habituation to both the fear of death and physiological pain. Respondents are asked to rate statements on a 5-point likert scale. Total scores can range from 0 to 16 with higher scores higher capability. Past research supports the construct validity and internal consistency of both the full and short versions of the ACSS.<sup>[21,22]</sup> Past research has documented expected relationships with self-reported fear of suicide, courage to attempt suicide, fear of pain as well as physiological measures of pain tolerance in support of the construct's convergent validity.<sup>[23]</sup> Importantly, the ACSS has repeatedly been demonstrated to be unrelated to depression symptom severity and suicidal ideation—findings in line with the proposition that capability and desire for suicide are distinct.<sup>[23]</sup> The alpha coefficient for the ACSS in this study was .77, indicating adequate reliability.

**Brief Agitation Measure (BAM; 7).** The BAM is a 3-item self-report scale designed to measure agitation. Respondents are asked to assess how true statements of agitation are to them on a 7-point likert scale. Total scores can range from 3–21 with higher scores associated with higher levels of agitation. Ribeiro et al. (2011) reported strong internal consistency and preliminary validity evidence.<sup>[7]</sup> In the present study, the alpha coefficient of .84.

**Interpersonal Needs Questionnaire (INQ; 24).** An abbreviated version of the INQ comprised of two subscales assessing thwarted belongingness and perceived burdensomeness was used. Each subscale was comprised of four items rated on 7-point likert scales. The INQ has consistently demonstrated sound psychometrics.<sup>[21,25]</sup> In this study, the internal consistency of both subscales was strong with coefficient alphas of .90 and .86 for the subscales, respectively.

**TABLE 1. Means, standard deviations, and intercorrelations**

	1	2	3	4	5	6
1. ACSS	1.00					
2. BAM	.02	1.00				
3. INQ-perceived burdensomeness	-.01	.37**	1.00			
4. INQ-thwarted belongingness	-.07*	.34**	.36**	1.00		
5. SCS	-.03	.40**	.60**	.33**	1.00	
6. DSI-SS	.04	.22**	.38**	.23**	.51**	1.00
Mean	9.53	4.35	4.45	7.12	10.32	.03
Standard deviation	3.28	2.50	1.78	4.38	1.50	.26

ACSS, acquired capability for suicide scale; BAM, brief agitation measure; INQ, interpersonal needs questionnaire; SCS, suicide cognitions scale.

**Suicide Cognitions Scale (SCS; 26).** The version of the SCS used consists of 10 items measuring suicide-specific hopelessness including helplessness, unlovability, and distress tolerance. Scores range from 10 to 50 with higher scores representing higher suicidal hopelessness. The alpha in the present sample was adequate (.82). Of note, several SCS items directly references suicide, and therefore is conflated, at least to a degree, with most suicide-relevant variables, including the DSI-SS.

**Depressive Symptoms Index–Suicidality Subscale (DSI-SS; 27).** The DSI-SS is a 4-item self-report scale designed to assess the degree and severity of suicidal thoughts, plans, and urges. Respondents respond using a 4-point likert scales. Higher scores indicate greater severity. The DSI-SS has been shown to have strong psychometric properties.<sup>[28,29]</sup> The DSI-SS had an alpha coefficient of .60 in this study. The attenuated coefficient alpha is notable, given the DSI-SS has repeatedly demonstrated strong internal consistency.<sup>[28–30]</sup> Given the sample, the lower alpha may be indicative of withholding information regarding the severity of suicidality.<sup>2</sup>

## RESULTS

### Preliminary Analyses

Means, standard deviations, and intercorrelations are presented in Table 1. As expected, perceived burdensomeness, thwarted belongingness, agitation, and suicidal cognitions were associated with each other as well as DSI-SS suicidality scores. The strongest association with the DSI-SS was with the SCS, which was in the moderate-to-strong range ( $r = .51, P < .001$ ). This is not surprising given the SCS item content, which includes direct references to suicidal thoughts. All other

<sup>2</sup>Consistent with the possibility of underreport, analyses examining response frequency and item-level correlations of the DSI-SS items indicated that endorsement of Item 2 was rare and its associations with the other items of the DSI-SS were all very modest or nonsignificant. Item 2 of the DSI-SS directly assesses the development of a plan for suicide, which may conceivably result in more intensive intervention if endorsed as compared to the intervention that might be indicated by endorsing suicidal ideation or ability to control suicidal urges in the absence of a plan for suicide. Alpha increased to close to .70 when it was recalculated for the items of the DSI-SS omitting Item 2.

**TABLE 2. Hierarchical multiple regression predicting DSI-SS scores from the interaction of BAM and ACSS scores, controlling for INQ-thwarted belongingness, INQ-perceived burdensomeness, and SCS scores**

	$R^2$	$\beta$	$t$	$P$
Step 1	.266			
INQ-thwarted belongingness		.014	3.18	.002
INQ-perceived burdensomeness		-.003	-1.89	.06
SCS		.073	13.75	<.001
Step 2	.270			
BAM		-.001	-.43	.66
ACSS		.005	2.40	.04
Step 3	.281			
ACSS X BAM		.003	4.36	<.001

ACSS, acquired capability for suicide scale; BAM, brief agitation measure; INQ, interpersonal needs questionnaire; SCS, suicide cognitions scale.

associations fell in the low-to-moderate range. As is consistent with the interpersonal theory, capability (ACSS scores) failed to demonstrate a significant zero-order correlation with DSI-SS (and only evidenced a very modest association when entered as a main effect into the regression model; see Table 2). This finding is in line with the interpersonal theory of suicide as the capability for suicide is distinct from suicidal ideation and should only be predictive of suicidal behavior when experienced in conjunction with suicidal desire. As such, we would expect very modest (if any) associations with outcomes related to suicidality, just as we found here. Scores on the DSI-SS are also of note. The mean and standard deviation of the scale were lower than expected. Although this may be accurate given that recruiters are selected because of their relatively high functioning, it is also a possible indication of underreporting.

#### Capability, Agitation, and Their Interaction as Predictors of Suicidality

Hierarchical multiple regression was used to examine the effect of the interaction between agitation and capability for suicide on suicidality, controlling for thwarted belongingness, perceived burdensomeness, and suicidal cognitions. In the first step, SCS scores as well as scores on the thwarted belongingness and perceived burdensomeness subscales of the INQ were entered. Agitation (BAM) and capability (ACSS) were entered into the analysis as predictors in the second step, and the interaction between ACSS and BAM scores was entered in the third. Results indicated that the model as a whole was significant ( $F[6, 1201] = 78.23, P < .001$ ), explaining 28.1% of the variance in DSI-SS suicidality scores. As expected, the influence of the covariates was strong accounting for a significant proportion of the variance in DSI-SS in the first step of the model. In the second step, capability evidenced a significant main effect ( $\beta = .005$ ,

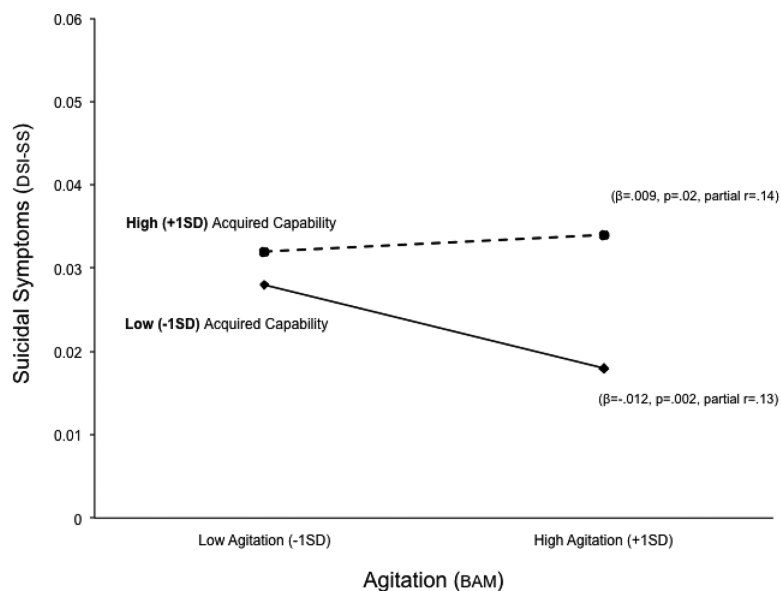
$P = .04$ , partial  $r = .07$ ), which, in line with the interpersonal theory's proposition, was modest in magnitude. Also consistent with the perspective of the interpersonal theory of suicide (and in contrast to alternative perspectives discussed above), the main effect of arousal failed to evidence a significant main effect on DSI-SS scores ( $\beta = -.001, P = .66$ ). With respect to the joint influence of agitation and capability, results were also in line with our a priori hypotheses: the statistical interaction of agitation and capability remained significant, even after accounting for the main effects of BAM and ACSS scores as well as the effects of INQ-perceived burdensomeness, INQ-thwarted belongingness, and SCS scores ( $\beta = .003, P < .001$ , partial  $r = .13$ ). The interaction accounted for 1.1% beyond the main effects of capability and agitation as well as the effects of suicidal cognitions, belongingness, and perceived burdensomeness, which accounted for 27.0% of the variance (see Table 2 and Fig. 1).

To interpret this interaction, we assessed the simple effect of agitation among individuals high (1 SD above the mean) and low (1 SD below the mean) in capability ( $M = 9.53, SD = 3.28$ ). As anticipated, among individuals high on capability, as agitation increased, suicidality also increased ( $\beta = .009, P = .02$ , partial  $r = .14$ ). Among individuals low on capability, as agitation increases, DSI-SS scores decrease, when controlling for belongingness, perceived burdensomeness, and suicidal cognitions ( $\beta = -.012, P = .002$ , partial  $r = .13$ ).

## DISCUSSION

The interpersonal theory of suicide suggests that most people who desire suicide will not die by suicide because of the frightening and often physically painful nature of suicidal behavior. Consistent with the proposition that suicide is fearsome, converging evidence indicates acute states of heightened arousal are common immediately preceding serious suicidal behavior. In this paper, we argued that heightened arousal emerges as a result of perseverating on and planning for imminent suicidal behavior. We further suggested that, for most, the heightened arousal will be life-saving as it will prompt further avoidance of engaging in suicidal behavior; however, among individuals who have become inured to the fearsome nature of suicide, heightened arousal states would serve to facilitate suicidal behavior as it would provide sufficient energy and arousal to confront the threat. The present project was designed to test this hypothesis. Results were as anticipated.

As expected, suicide risk increased as a function of the interaction between acute agitation and capability, such that risk was highest among individuals who were high in capability and agitation. For individuals low on capability, increasing levels of agitation were associated with lower suicide risk as measured by the DSI-SS. The effect of the statistical interaction held beyond the main effects of agitation and capability as well as the effects of strong covariates associated with suicidal desire—namely, thwarted



Note. ACSS = Acquired Capability for Suicide Scale; BAM = Brief Agitation Measure; INQ = Interpersonal Needs Questionnaire; SCS = Suicide Cognitions Scale.

**Figure 1.** Interaction of BAM and ACSS scores predicting DSI-SS scores, controlling for INQ-thwarted belongingness, INQ-perceived burdensomeness, and SCS scores.

belongingness, perceived burdensomeness, and suicidal cognitions.

Prior to discussing the implications of these findings on research and practice, several limitations are notable. First, our assessments were limited to self-report. This may be particularly relevant where stigma about mental health is well-documented, such as within the military.<sup>[31,32]</sup> In the present sample, for instance, the attenuated mean, standard deviation, and coefficient alpha associated with the DSI-SS may be indicative of biased self-report. Multiple methods of measurement, such as objective assessments coupled with self-report, would be preferred. Second, the outcome measure can be improved. The present project used an index of suicidality that includes questions about current suicidal thoughts, plans, and urges. As our argument holds that capability and agitation may function to increase the likelihood of suicidal behavior, examining the influence of the relationship on behavior (e.g., preparations, attempts, death) per se would be optimal. Third, the findings from the present research are cross-sectional. Prospective and experimental study designs may clarify the direction of causality. Fourth, because the sample is predominantly male and drawn from a military population, the generalizability of the findings is in question. Replication studies implemented in samples more representative of the general population are necessary. Though, using an enriched sample such as the present one that is enriched with respect to several salient risk factors (e.g., male; military) often increases the likelihood of identifying findings relevant to high-risk populations.

A final limitation of the current investigation is that the magnitude of the effect of the statistical interaction between agitation and capability is small. Cautious interpretation of the current findings is warranted, as the meaningfulness of the statistical interaction remains in question. In part, detection of the effect may have been more difficult given that the sample used in the present study was not at acute risk of suicide. As evidence indicates that agitation may be particularly relevant especially among individuals at acute risk, future studies should look to examine the interactive effects of agitation and capability among individuals at acute suicide risk.

The present study extends the existing empirical literature base documenting a link between agitation and suicide. The link is well documented; yet, theoretically grounded explanations are scant. The present project was designed to address this gap. Though the effect was modest in magnitude, the findings of the present study offer initial evidence for the moderating role of capability on the effects of agitation on suicide. Of note, agitation represents only one state of heightened arousal linked to suicidal behavior. Other acute states—for instance, sleep disturbance (e.g., insomnia, nightmares), panic attacks, and akathisia, among others—also have documented links to serious and imminent suicidal behavior.<sup>[7,12,13,33]</sup> More research focused on understanding the role of acute overarousal in imminent suicidal behavior would be fruitful. Beyond this, the present findings also add to the construct validity of the capability as well as the theory's proposition that suicide is fearsome and requires energy to enact.

At first blush, finding that the interaction between capability and agitation significantly predicts an outcome measure mostly composed of items assessing suicidal thoughts may seem inconsistent with the theory, as the theory would hold that capability should only be associated with outcomes of suicidal ideation when in the presence of the risk factors for desire—perceived burdensomeness and thwarted belongingness. We controlled for the influence of variables associated with suicidal ideation and found evidence that the interaction of capability and agitation remained significant. It is important to note, however, that the items that comprise the DSI-SS not only assess ideation but plans as well. Previous research has demonstrated that suicide risk can be differentiated into two separable factors—desire/ideation and resolved plans/preparation.<sup>[34,35]</sup> Resolved plans and preparation includes elevated suicidal intent<sup>[34]</sup> and shown to be predictive of later death by suicide.<sup>[36]</sup> According to Van Orden et al. (2010), suicidal intent indicates requires habituation to the fear involved in suicide to the degree necessary to formulate a plan and engage in suicidal behaviors.<sup>[4]</sup>

Further, although alternative perspectives may suggest that suicide would be used to escape agitation, our findings do not support this conceptualization. If suicide were to increase as a function of increasing agitation alone, we would expect the main effect of agitation to be significant beyond the effects of the other predictors in the model. Instead, agitation's effect on suicide is moderated by level of capability for suicide. It is also notable that a significant effect was observed for individuals low on capability such that increased arousal was associated with significantly less suicidality. This effect is highly consistent with the interpersonal theory but difficult to square with escape-based models.

Should future findings fall in line with the results of the present investigation, several clinical implications would be indicated. The present findings add to a literature base that suggests that agitation may be an important risk assessment target. Beyond having a clear link to suicide, agitation has limited face validity. Because of this, it may be a particularly informative, especially among high-risk individuals who may be unable or unwilling to disclose information about suicidal ideation or intent. Several studies have reported that many suicide decedents fail to directly communicate suicidal intent in the days and weeks preceding their deaths,<sup>[37]</sup> even when directly questioned about suicidal symptoms.<sup>[10,38]</sup> In settings where stigma about mental health symptoms is common, incorporating the assessment of risk factors with limited face validity, such as agitation, may be useful. One such setting is within the military, for instance, where stigma about mental health is well-documented<sup>[30]</sup> and capability is likely high, given that combat exposure has been shown to confer risk for its development.<sup>[39]</sup>

Our findings, should they be replicated in future investigations, also have implications for treatment planning. Agitation may be especially dangerous among individuals high on capability. To date, very little is known about

the malleability of the capability for suicide. It has been suggested that treating or reducing an individual's level of capability for suicide may be difficult and time intensive, as it would require reversing an individual's learned associations about pain, injury, and death.<sup>[4]</sup> Acute agitation, by contrast, is time limited and modifiable.<sup>[12]</sup> Therefore, should agitation arise, particularly among individuals who likely are higher on capability, it may be prudent to prioritize the treatment of the acute agitation.

In sum, the present research represents an initial effort evaluating agitation and suicidal behavior through the perspective of the interpersonal theory of suicide. Findings suggest that the agitation at high levels of capability may be a particularly dangerous. We look forward to prospective and experimental designs that are able to further refine our understanding of the association between imminent suicide risk, agitation, and other acute states of heightened arousal, and the capability for suicide.

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