



Research report

Capability for suicide interacts with states of heightened arousal to predict death by suicide beyond the effects of depression and hopelessness



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ABSTRACT

Background: States of heightened arousal (e.g., agitation, sleep disturbance) have been repeatedly linked to suicidal thoughts and behaviors, including attempts and death. Studies have further indicated that these states may be particularly pernicious among individuals who evidence high suicidal capability. The objective of this study was to examine the interactive effects of heightened arousal and the capability for suicide in the prospective prediction of death by suicide. We examine this relation beyond the effects of robust predictors of suicide, namely depression and hopelessness.

Methods: Participants were drawn from a larger study of undergraduates who completed baseline assessments during their freshman year and were then followed to time of death. The sample in this study only included individuals who had died by suicide ($n=96$) or other causes ($n=542$). Proxy measures to assess predictor variables were constructed using items from the MMPI, which was administered at baseline. An independent sample of clinical outpatients ($n=$ was used to evaluate the construct validity of the proxy measures).

Results: Results were in line with expectation: heightened arousal interacted with capability for suicide to prospectively predict death by suicide, such that, as severity of heightened arousal symptoms increased, the likelihood of death by suicide increased among individuals high but not low on capability for suicide.

Limitations: Limitations include the use of proxy measures, the extended length of follow-up, and the homogeneity of the sample (i.e., primarily White males).

Conclusion: These findings add to an emerging literature that supports the moderating influence of capability for suicide on the relationship between states of heightened arousal on the likelihood of death by suicide.

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1. Introduction

Suicide claims the lives of over one million individuals annually (World Health Organization, 2012). Despite continued efforts to prevent death by suicide, suicide rates have continued to increase (Centers for Disease Control and Prevention, 2014). With few exceptions, research has primarily focused on identifying associated correlates and risk factors of suicidal thoughts and behaviors. Across studies identifying risk factors for suicide, states of increased arousal are often cited (Fawcett et al., 1990; Rudd et al.,

2006). Suicide decedents, in the days prior to their deaths, are often characterized as psychologically and physiologically over-aroused (Robins, 1981; Busch et al., 2003). Specifically, evidence has accrued indicating that sleep disturbance as well as states of agitation may be particularly relevant to suicide.

Despite their importance, efforts focused exclusively on identifying correlates or risk factors for suicide are limited in their potential for identifying the causal mechanisms underlying suicidal behavior – theory-driven research may be a more fruitful means to meet this end. Yet, theoretically-driven research examining the relation between states of heightened arousal and suicidal behavior remains scant. The present paper draws from a leading theoretical model of suicide (i.e., interpersonal-

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psychological theory of suicide; Joiner, 2005; Van Orden et al., 2010), which argues that engaging in potentially lethal suicidal behavior requires both the desire to die and the capability to do so. As such, we suggest that heightened arousal states will only result in death by suicide among individuals evidencing the capability for suicide.

Suicide involves direct exposure to threats to survival; therefore, attempting suicide will naturally evoke a defensive or avoidant response from most individuals. Consistent with this, suicidal behavior is extremely rare, even among individuals who desire to die (Nock et al., 2008). Suicidal desire, therefore, has been proposed as insufficient in the prediction of near-lethal or lethal suicide attempts – individuals must also possess the capability for suicide (Joiner, 2005; Van Orden et al., 2010). Conceptually, capability for suicide is distinct from suicidal desire – that is, its nature, development, and role in suicide is distinct from that of the factors resulting in the desire for death (Ribeiro et al., 2014a, 2014b, 2014c). It is conceptualized as the result of overcoming the obstacles that prevent many individuals from engaging in suicidal behavior. Some of the primary obstacles to engaging in lethal suicidal behavior involve the fear and pain necessarily involved in inflicting harm. Therefore, it has been suggested that the capability for suicide will be reflected primarily in an individual's sense of fearlessness about pain, injury and death as well as an individual's level of physical pain tolerance (Joiner, 2005; Ribeiro et al., 2014a, 2014b, 2014c; Van Orden et al., 2010). Alone, however, capability for suicide should not result in suicidal behavior, as an individual must also evidence requisite levels of the desire to die.

As noted above, states characterized by heightened arousal symptoms have been shown to confer risk of serious suicidal behavior. Expert clinical consensus and a burgeoning literature highlight the importance of heightened arousal, such as sleep disturbance and agitation, in the prediction of suicide risk (Rudd et al., 2006; Ribeiro et al., 2014a, 2014b, 2014c). For instance, in a psychological autopsy study of suicide decedents in the days before their deaths, across a range of psychological disorders, insomnia symptoms and agitation (i.e., “tension,” “nervousness”) emerged among the most frequently reported symptoms observed in suicide decedents in the time preceding their deaths (Robins, 1981). Similarly, in a prospective study examining predictors of death by suicide in mood disorder patients, only insomnia and agitation (i.e., “psychic anxiety”) emerged as significant predictors at one-year follow-up (Fawcett et al., 1990).

Expert clinical consensus and a growing empirical literature have underscored the clinical importance of agitation, particularly when present in individuals at high risk of suicide (Rudd et al., 2006). Empirical evidence draws largely from retrospective studies of suicide decedents and suicide attempt survivors. Particularly in the time period shortly preceding suicide, decedents are often described as behaviorally and psychologically agitated (Busch et al., 2003). Some studies have documented agitation being present in close to 90% of suicide decedents in the weeks before their deaths (Busch et al., 2003). Agitation has also been linked with non-lethal suicide attempts (Hall et al., 1999).

Sleep disturbances have emerged as robust predictors of suicidal thoughts and behaviors as well (Bernert and Joiner, 2007). Despite associations with depression, which also confers risk of suicide, sleep disturbances appear to independently increase risk (Pigeon et al., 2012). Poor sleep quality in general appears to be a substantial risk factor for serious suicidal behavior. For instance, in a recent study, poor sleep quality at baseline independently predicted death by suicide at 10-year follow-up, and these effects held even beyond the effects of depressive symptoms (Bernert et al., 2014). Insomnia symptoms and nightmares appear to be particularly salient, according to a recent meta-analysis examining the effects of sleep on suicidal thoughts and behaviors (Pigeon et al.,

2012). With respect to insomnia, symptoms have been associated with suicide attempts (Barbe et al., 2005; Liu, 2004; Wojnar et al., 2009; Agargun et al., 2007; Nruham et al., 2008; Wong et al., 2011; Sjöström et al., 2007) and death (Goldstein et al., 2008; Bjorngaard et al., 2011; Fujino et al., 2005; McGirr et al., 2007). Insomnia symptoms have also been found to predict future suicide attempts at one month follow up, even after accounting for depression, hopelessness, and a range of other robust predictors of suicide (Ribeiro et al., 2012).

Nightmares, though having received less systematic empirical attention, have also been identified as salient suicide risk factors. The presence and frequency of nightmares have been shown to significantly increase risk of suicide death, with evidence indicating that occasional nightmare sufferers were at 57% greater risk of death by suicide whereas frequent nightmare sufferers were at 107% greater risk (Tanskanen et al., 2001). Similarly, Li et al. (2010) reported that suffering from frequent nightmares was associated with an eight-fold increase in the likelihood of attempting suicide within a year. When insomnia and nightmares co-occur, risk of suicidal behavior is greater still (Li et al., 2010).

Recent research has suggested that the effects of heightened states of arousal, such as agitation and sleep disturbance, on serious suicidal behavior may be influenced by capability for suicide (Ribeiro et al., 2015, 2014a, 2014b, 2014c). As described above, the prospect of engaging in serious suicidal behavior is innately frightening for most individuals. Among individuals who are low on capability for suicide – that is, among individuals who remain fearful of pain, injury, and death – heightened arousal states may serve to promote further avoidance of the potentially lethal stimuli involved in engaging in serious suicidal behavior. However, among individuals evidencing high levels of capability for suicide (i.e., individuals who are fearless about pain, injury, and death), the increased arousal symptoms may provide them with necessary arousal to approach the potentially lethal stimuli required to engage in serious suicidal behavior. Emerging evidence supports this proposition. In a study of active-duty soldiers, Ribeiro et al. (2015) reported that capability for suicide ratings interacted with ratings of subjective agitation to predict greater suicide risk, even after controlling for documented risk factors of suicidal ideation. Heightened arousal, as indexed by the combination of insomnia symptoms, nightmares, and agitation, were also found to interact with capability for suicide in the prediction of suicidal symptom severity, controlling for symptoms of anxiety and depression, in a large sample of clinical outpatients (Ribeiro et al., 2014a, 2014b, 2014c).

Although there is research supporting the moderating role of capability in the relationship between heightened arousal and suicide, the existing research has two critical limitations: first, all research in this domain has been cross-sectional, which precludes temporal inference and second, none of the studies has directly examined the outcome of suicide death. To this end, the present project is designed as a longitudinal evaluation of the interactive effects of heightened arousal symptoms and the capability for suicide in the prediction of death by suicide versus other causes of death. We examine these effects beyond the effects of depression and hopelessness. As proxy measures were developed to assess each predictor of interest, we also used an independent sample of clinical outpatients to evaluate the construct validity of the proxy scales. Given the prospective design, our findings will further clarify the enduring effects of baseline symptoms on later death by suicide. We expect that capability for suicide will moderate the effect of heightened arousal on death by suicide, such that the likelihood of death by suicide will increase as a function of greater baseline heightened arousal among individuals high on capability for suicide at baseline. We expect that there will be no significant

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