

# From ideation to action: recent advances in understanding suicide capability

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Suicide capability is one of few risk factors associated with suicide attempts among ideators. In the decade since the Interpersonal Psychological Theory of Suicide introduced the concept of acquired capability (i.e. the ability to face the fear and pain associated with death), understanding of the capability to attempt suicide has grown. Acquired (e.g. NSSI), dispositional (e.g. genetic), and practical contributors (e.g. access to firearms) appear to influence suicide capability via mechanisms such as the fear of death, persistence through pain, and familiarity with suicide methods. Self-report methods have shown mixed results, highlighting the importance of developing behavioral measures of suicide capability.

## Addresses

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## Introduction

The majority of people who think about suicide do not act on their thoughts [1]. However, our understanding of what differentiates risk for suicidal ideation from risk for suicide attempts is limited [2]. The Interpersonal Psychological Theory of Suicide (IPT) [3,4] was the first theory to use an 'ideation to action' framework [5], that is, to posit different risk factors for suicide attempts than for suicide ideation. This ran counter to the long held, but rarely articulated, belief that suicide attempts resulted solely from worse ideation. The IPT suggests that the capability to approach the pain and fear involved in enacting one's own death, which opposes the evolutionary goal of survival, must be acquired, primarily via repeated exposure to painful and/or fearsome experiences. Diverse experiences were thought to contribute to 'acquiring' capability, including experiences that were

endured (e.g. childhood maltreatment), enacted on others (e.g. combat exposure), and, perhaps most perniciously, enacted on oneself (e.g. nonsuicidal self-injury (NSSI)). Importantly, acquired capability was theorized to operate independently of suicidal thoughts; only when suicidal desire interacts with the ability to approach fear of death and pain would a serious suicide attempt occur.

In the decade since its publication, new theories expanding on the IPTS have emerged. The Integrated Motivational Volitional Theory [6] hypothesized that impulsivity, intent, access to the lethal means, and social learning were also important in the transition from suicidal thoughts to actions. Klonsky and May [7\*\*] recently developed the Three-Step Theory, which identifies three distinct contributors to suicide capability: dispositional, acquired, and practical. In this model, dispositional contributors (e.g. genetics, personality traits) are those that influence baseline levels of suicide capability, whereas acquired contributors, such as those described by Joiner [3], are repeated experiences that wear away at natural barriers to suicide (e.g. fear of death and pain avoidance), thereby increasing suicide capability. Practical contributors are concrete factors that make an attempt easier, such as access to firearms. This review aims to briefly describe the recent literature on suicide capability, including its measurement, mechanisms, contributors, and time course, as well as directions for future research.

## Measurement

Until very recently, the only published capability measure was the Acquired Capability for Suicide Scale (ACSS; [8]), developed in conjunction with the IPTS [3]. While the original measure contained 20 items assessing fearlessness and pain tolerance, recent psychometric investigations of the original ACSS and several shortened versions [9,10] support the use of a revised 7 item version specifically assessing fearlessness about death [9]. The Suicide Capacity Scale [7\*\*] and the Acquired Capability With Rehearsal for Suicide Scale [11\*] were recently developed to assess broader definitions of suicide capability.

There has been increasing interest in alternatives to self-report measures of suicide capability. For example, death and suicide-related versions of the Implicit Association Test (IAT; [12]), a behavioral measure of implicit attitudes, have been found to distinguish suicide attempters from ideators [13]. These measures may tap into a subconscious or unconscious comfort with one's own death that is not captured by a questionnaire. Using EEG

methodology, a recent study found that a blunted neural response to threatening images was associated with attempts rather than ideation [14]. Another promising tool is the Self-Directed Violence Picture System [15], normed suicide-death specific images that may be used to probe behavioral and cognitive responses to suicide-specific fearsome images. Future work on the measurement of suicide capability will also require use of precise terminology to distinguish between suicide capability itself (i.e. overarching latent construct capturing the ability to act on suicidal thoughts), contributors to suicide capability (i.e. variables influencing capability, for example genetics, NSSI, access to firearms), and the mechanisms by which these contributors may be acting (i.e. reducing fear of death, impacting pain tolerance, or increasing knowledge of lethal means).

### Fearlessness about death

Overwhelmingly, recent work has found an absence of evidence that acquired capability or fearlessness about death, as measured by the ACSS or the ACSS-FAD, distinguishes people who attempt suicide from those who ideate. This pattern appears among young adults with psychosis [16], individuals with eating disorders [17], domestic violence offenders [18], college students [19<sup>\*</sup>], and online samples [20,21]. Fearlessness about death also does not distinguish emergency department patients presenting for suicide attempts versus ideation [22<sup>\*</sup>]. However, these null results are not universal. Smith *et al.* [23] found that current ideation was only related to past suicide attempt for individuals who reported less fear of pain involved in dying. Further, some recent large studies found higher fearlessness about death among suicide attempters compared to ideators in UK university students [24] and US adults [7<sup>\*\*</sup>]. While self-reported fearlessness about death is not a consistent correlate of suicide capability, further research may clarify whether fearlessness about death relates to suicidal behavior in certain populations or in concert with other aspects of suicide capability.

### Pain tolerance

Less research has investigated pain tolerance as a mechanism that increases suicide capability. Generally, self-report measures of pain tolerance have not differentiated individuals with attempts from those with ideation [24], and in at least one study, those with a history of suicide attempts or NSSI actually reported greater pain distress than those with suicide ideation only [25]. Within samples that self-injure, increased pain severity during NSSI was also associated with suicide attempts [26]. These findings run counter to theory, in that they suggest that greater pain severity and distress are associated with attempts as compared to ideation.

Recent innovative work using objective measures of pain in the context of frustrating behavioral tasks has begun to

shed light on these paradoxical findings [27,28<sup>\*\*</sup>]. While no relationship was observed between attempt status and pain tolerance or threshold, the relationship between past attempts and current ideation was moderated by task persistence, such that ideation was more strongly related to attempts amongst those with mean or high levels of persistence through a painful and frustrating task [28<sup>\*\*</sup>]. Similarly, the relationship between NSSI and suicide attempts was also strongest among those higher in persistence through painful and distressing tasks [27]. This suggests that, though low distress tolerance may be a risk factor for suicide ideation, it may in fact be protective against suicidal behaviors, as one must be able to persist through physical and emotional distress in order to enact a suicide attempt.

### Acquired contributors to suicide capability

Painful and provocative experiences (PPE) are hypothesized to contribute to suicide capability by increasing habituation to pain and decreasing fearlessness about death [4]. Much work has focused on the relationship between these acquired contributors themselves and attempts among those with ideation. PPE exposure relates to suicide attempt history when controlling for suicidal ideation and other relevant covariates in both youth [29] and adults [17,30]. Research in this area has typically focused on two types of PPE: direct exposure to traumatic/threatening events and potentially painful or harmful self-directed behaviors.

Several recent publications have addressed the relationship between threatening or traumatic events and suicide risk. A meta-analytic review of the relationship between combat exposure and suicidality demonstrated a small, but statistically significant, effect of deployment or combat exposure on suicide-related outcomes [31]. A recent study of U.S. veterans with suicidal ideation compared to those with suicide attempts [32] found no differences in combat exposure; however, veterans with a history of attempted suicide reported greater levels of childhood trauma than veterans who reported passive suicidal ideation, but not compared to veterans with active suicidal ideation. Similarly, undergraduates who reported a suicide attempt with lethal intent reported more childhood physical abuse and neglect than those with only suicidal ideation, but did not differ from participants with a suicide plan; further, childhood sexual abuse did not differentiate participants at any level of suicidality [19<sup>\*</sup>]. Jordan *et al.* [33] found that among various traumatic experiences, including being the recipient of violence, only repeatedly committing violent acts against others was associated with suicidal behavior with lethal intent. Similarly, among women seeking shelter from interpersonal violence (IPV), having perpetrated IPV was associated with greater acquired capability, while experiencing interpersonal trauma or violence was not [34]. Together, these findings suggest that, while trauma exposure may be related to suicidality generally, it may not be

linked to suicide capability specifically. Furthermore, the act of committing violence against others may contribute more to suicide capability than being the victim of or witnessing violence. Finally, more nuanced measurement of suicidality (e.g. active/passive ideation, plans, intent, lethality) may help in clarifying the relationship between contributors to capability and the suicidal process.

Behaviors that are directly or indirectly self-damaging have also been associated with acquired capability. Two recent studies of adolescents found that health risk behaviors overall were related to suicide capability, either through a significant relationship to attempts when controlling for ideation [35] or by comparing adolescents with ideation only to adolescents with attempts [36]. With respect to substance use, one type of health risk behavior, while use alone may not be linked to suicide capability, certain characteristics of use may be. For example, among undergraduates, alcohol and drug use did not differentiate among participants with suicidal ideation, plans, or attempts [19]. However, in a large, nationally representative survey of participants using potentially injectable substances (i.e. cocaine, heroin, stimulants), choosing a more painful and risky route of administration (i.e. injection) was associated with attempts among those who considered or planned for suicide, even when controlling for depression and substance use disorder symptoms [37]. With respect to disordered eating behavior, a similar pattern has emerged, whereby behaviors that are less directly painful or provocative (such as eating restraint [19] and binge eating [17]) did not distinguish individuals with suicidal thoughts from those with suicide attempts while others (such as self-induced vomiting [17]) did.

Directly self-damaging behaviors have been robustly associated with suicide capability, with research showing that attempted suicide is associated with higher NSSI frequency [19] and use of more NSSI methods [36] compared to ideation only. Further, in undergraduate students, suicidal ideation was only related to suicide attempts among individuals who reported higher levels of NSSI [38]. Among adolescents receiving inpatient psychiatric care, NSSI frequency and number of methods both predicted lifetime suicide attempts in the context of suicidal ideation, though self-reported fearlessness about death, a hypothesized mechanism, was not predictive [39]. Longitudinal research in community adolescent girls has shown that NSSI in the context of suicidal ideation prospectively predicts higher risk of suicide attempts compared to suicidal ideation alone [40]. NSSI may, therefore, be a particularly important acquired contributor to target when working with suicidal patients.

### Practical contributors to suicide capability

The practical contributors to capability make attempting suicide easier, for example, familiarity with and access to

suicide methods, or exposure to others' suicidal behavior. Firearms have emerged as a key practical contributor. A psychological autopsy study found that all suicide decedents who died by firearm, owned the firearm, and the majority of decedents who owned a firearm used that as their method [41], indicating a strong relationship between firearm access and suicide death by firearm. Further, epidemiological data suggests that suicide deaths correspond to the repeal or implementation of handgun regulations, and that changes in suicide death rates may be explained by reductions in suicides by firearm [42,43,44]. Importantly, this work argues against means substitution and emphasizes the importance and specificity of practical contributors to suicide capability overall. Firearm storage also matters, insofar as the relationship between current ideation and the self-reported likelihood of a future attempt is stronger among those who store personal guns loaded and unsecured [45].

Exposure to suicide may also be conceptualized as a practical contributor to suicide capability. Knowing that a family member or friend attempted suicide may not only expose an individual to details about suicide methods, but may also make that action seem more feasible. Among a cluster of proposed contributors to capability, exposure to friends' or family members' suicide attempt or NSSI showed the strongest relationship to attempts among ideators [24]. Exposure to a schoolmate's suicide also prospectively predicts attempts among youth [46]. These findings suggest the importance not only of addressing within-person aspects of capability (such as personality traits or NSSI), but also of addressing public health and means safety programs that could impact practical contributors to capability.

### Dispositional contributors to suicide capability

Compared to acquired and practical contributors, less recent work exists on dispositional contributors, though a strong genetic component of suicide capability has been observed [47]. Somewhat more is known about personality traits and capability. Small, but consistent, positive associations have been observed between fearlessness about death and extraversion and openness, as well as negative associations with neuroticism [48,49]. Experimental work has shown that only people higher in sensation-seeking showed a relationship between distress tolerance and pain tolerance, supporting the pathway that dispositional contributors, such as temperament, may increase overall suicide capability by increasing the likelihood of PPEs [50]. Additionally, interoceptive deficits (i.e. difficulty sensing internal physiological sensations) have been associated with suicide attempts among ideators [51].

### Time course of suicide capability

Until recently, there has been no longitudinal work on capability. Bryan and colleagues [52] assessed capability among members of the US military. Contrary to

expectations, capability did not increase from pre-deployment to post, even when controlling for combat exposure or previous deployments. On the other hand, among undergraduates, NSSI frequency predicted increased capability one year later, while the reverse was not true [53\*\*]. This supports the conclusion that NSSI influences capability, rather than higher capability leading to increases in NSSI frequency. Neither adults [54] nor adolescents [55] in outpatient psychotherapy evidenced changes to capability over 1–3 months of treatment. However, one study suggests that capability may be more malleable. Using a newly developed measure, George *et al.* [11\*] found that, among hospitalized adults with a history of ideation or attempt, mental preparation for suicide and fearlessness about death both dropped significantly over an average of 2 weeks of treatment, while pain tolerance did not change. Differences across studies in population, suicide history, measures, and time course make it difficult to draw firm conclusions, but these intriguing findings suggest that the temporal sequence of capability for suicide is an important area for future study.

### Conclusions and future directions

Suicide capability is one of the few factors that distinguishes people who attempt suicide from those who ideate. An explosion of work in recent years has led to a more nuanced understanding of the construct, demonstrating that suicide capability has more contributors than originally conceived, some contributors are more influential than others, capability interacts with other variables in complex ways, and existing self-report measures have limited utility. More work is needed to understand how capability is influenced (e.g. are fearlessness about death and pain tolerance the key mechanisms?), the best measurement approach (e.g. are behavioral tasks, measures of contributors, or measures of the construct itself most useful?), the most pertinent contributors (e.g. among the different contributors to capability, which hold the most power?), and the time course of capability (e.g. what impacts the development of, maintenance of, and changes in capability?). Continuing to refine and improve our understanding of suicide capability is essential to moving forward with the incredibly important and challenging tasks of predicting and preventing suicide attempts and deaths.

### Conflict of interest statement

Nothing declared.

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