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Ideation-to-action theories of suicide: a conceptual and empirical update

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This review provides a conceptual and empirical update regarding ideation-to-action theories of suicide. These theories — including the interpersonal theory (IPTS), integrated motivational–volitional model (IMV), three-step theory (3ST), and fluid vulnerability theory (FVT) — agree that, firstly, the development of suicidal ideation and secondly, the progression from suicide desire to attempts are distinct processes with distinct explanations. At the same time, these theories have some substantive differences. A literature review indicates that the IPTS has received extensive examination, whereas evidence has only begun to accumulate for the other theories. Based on current evidence, we offer three inferences. First, the capability for suicide meaningfully distinguishes those who have attempted suicide (attempters) from those with suicidal desire who have not attempted (ideators). This encouraging finding is broadly consistent with the IPTS, IMV, and 3ST. The nature and measurement of capability warrant further attention. Second, consistent with the 3ST, accumulating evidence suggests that pain and hopelessness motivate suicidal desire more than other factors. Third, the FVT, which is largely compatible with other theories, may be best equipped to explain the non-linear time-course of suicidal ideation and attempts. Longitudinal studies over various time-frames (minutes, hours, days, weeks, months) are necessary to further evaluate and elaborate ideation-to-action theories of suicide.

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Introduction

Decades of research and prevention efforts have failed to meaningfully enhance the prediction or reduction of suicide [1•,2•]. One reason for limited progress is inadequate knowledge about the transition from suicide ideation to attempts [3]. The attempter-ideator distinction is critical because most individuals with suicidal ideation do not attempt suicide [4,5]. Past research has suggested that depression, hopelessness, most mental disorders, and even impulsivity are predictive of suicide. However, closer examination reveals that these variables struggle to distinguish between suicide attempters and suicide ideators, suggesting that they represent robust predictors of suicidal ideation, not suicide attempts [3,6,7•]. Many other risk factors for suicide show a similar pattern: anhedonia, low belongingness, bullying (both perpetration and victimization), burdensomeness, defeat, emotion dysregulation, entrapment, and social disconnection each predict suicidal ideation but fail to predict attempts among ideators [8•]. In short, converging evidence suggests that commonly cited risk factors for suicide may in fact be risk factors for suicide ideation only, not progression to suicide attempts. Improved knowledge about the transition from suicide ideation to suicide attempts therefore is crucial for improved suicide prediction and prevention.

Historically, theories of suicide have not offered explanations for suicide attempts that meaningfully differed from explanations for suicidal ideation. For example, seminal theories emphasizing psychological pain, escape, social isolation, and hopelessness address suicidality as a single phenomenon in need of a single overarching explanation (for brief review see [1•]). Thomas Joiner's Interpersonal Theory of Suicide (IPTS), first published in 2005 [9], was a pioneering exception. Joiner postulated that two ingredients are necessary for a potentially lethal suicide attempt to occur: firstly, suicidal desire and secondly, the capability to act on that desire. What is unique about Joiner's IPTS is the suggestion that suicidal desire alone is not sufficient for attempting suicide. Rather, to attempt suicide an individual must overcome the fear inherent in attempting lethal self-harm, which the IPTS refers to as the capability for suicide. Not only has the IPTS garnered a tremendous amount of attention in the research and clinical worlds, but it has arguably spawned a new generation of 'ideation-to-action' theories that, likewise, address both the development of suicidal ideation and the progression from suicidal ideation to suicide attempts.

We consider Joiner's IPTS to be the first in a line of 'next generation' theories of suicide. Below we describe each of these ideation-to-action theories, including: key tenets, conceptual similarities and differences with other ideation-to-action theories, and current empirical evidence.

The Interpersonal Theory of Suicide (IPTS)

The IPTS suggests that the combination of thwarted belongingness (TB) and perceived burdensomeness (PB) leads to suicidal desire, whereas the acquired capability for suicide facilitates progression from suicidal desire to potentially lethal suicide attempts [9,10]. TB occurs when a person's fundamental need to belong is unmet. PB refers to a person's perception of being a burden others, including, but not limited to, family members and friends. TB and PB are viewed as moderately related but distinct constructs that together give rise to active suicidal desire. Individually, TB and PB can give rise to passive suicidal desire.

The IPTS introduced the construct of acquired capability because it viewed suicidal desire as necessary but not sufficient for a potentially lethal suicide attempt. Even among individuals high on suicidal desire, evolutionary grounded fears of death and pain represent significant barriers to suicide. However, according to the IPTS, exposure to painful and provocative events (PPEs) can lead individuals to habituate to the fear and pain involved in self-inflicted violence, thereby 'acquiring' the capability for enacting suicide. PPEs can take a variety of forms, including child maltreatment, combat exposure, self-starvation seen in anorexia, and nonsuicidal self-injury, to name just a few examples. Past non-lethal suicide attempts can also serve as PPEs that increases the capability to utilize more lethal means in future attempts.

The IPTS has been extremely influential and highly cited. Not surprisingly, then, the IPTS has been examined in dozens of empirical studies. Here, we summarize findings from two recent systematic reviews of the IPTS evidence. First, Ma *et al.* [11•] reviewed findings from 58 empirical studies of the IPTS. They found support for a robust association between PB and suicidal desire, a modest association for TB and suicidal desire, and a modest relationship between acquired capability and suicide attempts. The review found that the hypothesized interaction between PB and TB in predicting suicidal desire, and the hypothesized three-way interaction between PB, TB, and acquired capability for predicting suicide attempts, were less frequently examined. Within studies that examined these interactions, evidence provided good support for the former, but poor evidence for the latter. The systematic review concluded that the IPTS 'may not be as clearly defined nor supported as initially thought.' The review also notes the need for improved measures of IPTS constructs, especially acquired capability. This point may be especially important given the questionable validity of the specific measure of acquired capability used in many early studies [12], and since broader conceptualizations and measures of capability are successfully distinguishing suicide attempters from ideators [8•].

Another review examined evidence for the IPTS in adolescent populations [13]. Although the authors reviewed 17 studies, an important caveat is that none directly measured the IPTS constructs PB, TB, and acquired capability. Instead, IPTS constructs were measured through proxy variables. For example, a study on Loneliness was interpreted to be relevant for TB, studies of social support and quality of relationships were interpreted to yield findings relevant for both TB and PB, and variables such as injection drug use, exposure to violence, and nonsuicidal self-injury were used as proxies for acquired capability. The review concluded that evidence was strongest for the role of acquired capability in suicide attempts, but weaker regarding the relationships of PB and TB to suicidal ideation. That evidence for acquired capability was weaker in the adult review than the adolescent review may reflect the fact that the former review examined studies relying heavily on a particular measure of acquired capability whereas the studies in the adolescent review utilized varied and broader indices of capability.

Integrated motivational–volitional model (IMV)

The IMV, first articulated in 2011 [14], uses a similar structure to the IPTS. First, the Motivational Phase addresses the development of the intention to attempt suicide. Specifically, various life circumstances can lead to feelings of defeat/humiliation, which in the context of certain moderators (e.g. poor coping, poor problem solving) leads to feelings of entrapment. In turn, in the context of other moderators (e.g. belongingness, burdensomeness, low positive future thinking), entrapment can lead one to view suicide as a solution to life circumstances, and result in suicidal intent. Second, the Volitional Phase addresses the enactment of this intention. In the context of moderators such as increased capability, impulsivity, and access to lethal means, among others, suicidal intent progresses to suicidal behavior.

The IMV is similar to the IPTS not only in its ideation-to-action structure, but its incorporation of the belongingness and burdensomeness into the Motivational Phase, and its incorporation of acquired capability into the Volitional Phase. At the same time, the IMV diverges from the IPTS in at least two key ways. First, the featured pathways to suicidal ideation are defeat and entrapment, not belongingness and burdensomeness. Second, the Volitional Phase of the IMV expands beyond acquired capability and includes other factors such as impulsivity, access to lethal means, intention/planning, and imitation (e.g. social contagion/modeling).

Only a few studies have directly tested the IMV, providing promising evidence. Dhingra *et al.* [15] found support for the IMV in a large sample of UK-based university students. In particular, they found that defeat and entrapment predicted suicidal ideation, and that a variety of

volitional variables (e.g. self-harm by a family member or close friend, fearlessness about death, impulsivity) distinguished attempters from ideators. Similar results were obtained when utilizing structural equation modeling to evaluate the IMV in a larger sample of UK-based university students, though impulsivity did not predict suicide attempts [16]. In contrast, evidence from a US-based study [17] of university students conflicted with a part of the IMV: the relationship of defeat to suicidal ideation was robust but not mediated through entrapment, as predicted by the IMV. In sum, early evidence consistent with the IMV suggests that both defeat and entrapment relate robustly to suicidal ideation, and that a set of volitional variables broader than acquired capability helps distinguish suicide attempters from suicide ideators.

Three-step theory (3ST)

The 3ST is the most recently published ideation-to-action theory of suicide [18•]. Step 1 suggests that the combination of pain (usually psychological) and hopelessness cause suicidal ideation. The 3ST is purposefully non-specific regarding sources of pain because diverse forms of pain are sufficient to discourage and 'punish' behavior, whether in controlled behavioral experiments (e.g. electric shock, loud noises, social exclusion) or day-to-day life (e.g. interpersonal conflict and loss, chronic medical pain). The 3ST suggests that when life is miserable/aversive/painful, one is essentially being punished for engaging with life, which in turn begins a desire to avoid life. However, if one has hope that the pain can be diminished with time or effort, one's focus will be on achieving a better future rather than suicide. Therefore, pain and hopelessness in combination are required to develop and sustain suicidal ideation.

Step 2 of the 3ST suggests that ideation escalates when pain exceeds or overwhelms connectedness. Connectedness — whether to loved ones, valued roles, or any sense of meaning or purpose — can make life worth living despite pain. However, if pain exceeds connectedness, or if pain is so great as to preclude the experience of connectedness, suicidal ideation increases from modest/passive (e.g. 'Sometimes I wonder if I would be better off dead') to strong/active (e.g. 'I would kill myself if I could').

Step 3 suggests that strong suicidal ideation progresses to action when one has the capacity to attempt suicide. The 3ST specifies three contributors to the capacity to attempt suicide: Dispositional contributors such as a genetically high threshold for pain or low fear of death; Acquired contributors such as those elaborated in the IPTS; and Practical contributors such as knowledge of, expertise in, and access to lethal means. Regarding the latter, numerous factors can increase practical capacity for suicide, such as an Internet search about lethality of over-the-counter medications, or a job (e.g. anaesthesiologist, soldier) that comes with expertise in and access to lethal means.

The 3ST shares key features with the IPTS. For example, it emphasizes the role of connectedness in the development of suicidal ideation, and the role of acquired capability in the progression from suicidal ideation to action. However, the 3ST differs from the IPTS in at least two important ways. First, the 3ST features pain and hopelessness as the primary motivations for suicidal ideation. From the perspective of the 3ST, PB and TB *can* cause the pain and hopelessness that motivate suicidal ideation, but neither is necessary for two reasons: firstly, there are myriad causes of pain and hopelessness beyond PB and TB, and secondly, it is possible to experience PB and TB without developing suicidal ideation. Instead, the 3ST emphasizes connectedness for its protective role among those with pain and hopelessness. Second, the 3ST elaborates the concept of capability for suicide beyond acquired capability to include dispositional and practical contributors to capability. In this regard the 3ST may be viewed as more similar to the IMV, which incorporates factors such as access to lethal means and imitation in addition to acquired capability to help explain progression from ideation to action.

Because the 3ST was published in 2015 research has only begun to directly evaluate it. The study introducing the 3ST [18•] provided supporting evidence from a large US-based online adult sample. In particular: firstly, pain and hopelessness interacted to predict suicidal ideation robustly and better than PB and TB; secondly, connectedness, as well as the extent to which connectedness exceeded pain, predicted increased suicidal ideation among those with pain and hopelessness; and thirdly, dispositional, acquired, and practical contributors to suicide capacity each predicted suicide attempt history over and above suicidal ideation. Notably, a recent UK-based study largely replicated these findings [19].

Other studies of 3ST constructs provide additional empirical support. For example, converging evidence from both adolescents and adults find that pain and hopelessness motivate suicide attempts more than other factors such as burdensomeness, belongingness, and help-seeking [20,21•]. In addition, a recent study found that neuroticism positively predicts suicidal ideation but negatively predicts suicide attempts among ideators [22]. One interpretation is that neuroticism disposes people to increased pain, which increases risk for ideation, but at the same time disposes people to increased harm avoidance, which decreases dispositional capability for attempting suicide. Finally, a recent study [23] examined which of 42 factors were different in the days, hours, and minutes leading up to suicide deaths (based on reports from loved ones) and to medically severe but non-fatal attempts (based on reports from adolescents who had been hospitalized

overnight for suicide attempts). The list of 42 variables was diverse and included items such as sleep problems, agitation, giving away possessions, family conflict, disengagement from social activities, anger and hostility, and guilt or shame. Importantly, across both groups, the two items most commonly reported to precede suicide attempts and deaths were pain ('emotional misery or pain') and hopelessness ('feelings of hopelessness about the future'). Thus, accumulating evidence supports the 3ST's emphasis on pain and hopelessness more than other factors in the development of suicidal desire and motivation.

Fluid vulnerability theory

The fluid vulnerability theory (FVT) was first articulated by Rudd in 2006 as an extension of the suicidal mode [24], a cognitive-behavioral framework for conceptualizing suicidal states that was based on Beck's more general mode theory of psychopathology [25]. The FVT overlaps considerably with the IPTS, IMV, and 3ST, especially with respect to the hypothesized role of suicidogenic thoughts and beliefs [24,26]. Findings supporting the IPTS, IMV, and 3ST therefore support the FVT as well, although the FVT considers a broader spectrum of suicidogenic beliefs referred to as the *suicidal belief system*, and does not designate any particular thoughts and beliefs as being more or less important than any others. The specific variables designated by the IPTS and IMV are therefore assumed to reflect only *some* of the possible pathways to suicidal behavior. Supporting this perspective is research indicating that the Suicide Cognitions Scale, a self-report measure that assesses PB, TB, hopelessness, and other suicidogenic beliefs (e.g. self-hatred, unbearability), differentiates attempters from ideators, differentiates attempters from self-injurers, prospectively predicts future suicide attempts, predicts the severity of suicidal crises, and predicts the magnitude of post-crisis resolution of suicide risk better than scales that specifically measure PB, TB, and hopelessness [27–29].

The suicidal belief system is believed to reflect psychological manifestations of two underlying mechanistic vulnerabilities to suicidal behavior [30]: cognitive inflexibility and emotion regulation deficits. Both of these mechanisms must be targeted sufficiently to prevent the transition from suicidal thought to action. Focusing on only one (or a few) components of the suicidal belief system may be inadequate. This perspective is supported by a recent study in which the key variables proposed by the IPTS (PB, TB, and acquired capability) failed to explain treatment effects on subsequent risk for suicidal behavior [31], which implicates mechanisms that extend beyond these particular variables.

The aspect of the FVT that most clearly differentiates it from other existing models of suicide is its explicit focus on the *process* of suicide risk over time, both with respect to the emergence of suicidal behavior as well as the resolution of acute suicidal crises. The FVT is based on several core assumptions about temporal dynamics [24,32•]: firstly, suicide risk has dynamic properties that fluctuate in response to environmental and individual processes; secondly, suicide risk also has stable properties that resist change over time; thirdly, suicidal behaviors emerge as a result of the interaction between dynamic and stable risk processes; and fourthly, suicide risk resolves when multiple domains of the suicidal mode are sufficiently targeted. In combination, these assumptions implicate nonlinear (as opposed to linear) change processes, a perspective that has been supported by several studies published during the past few years [33–35]. These studies further indicate that certain characteristics of the change process itself may be more useful for understanding the emergence of suicidal behaviors and the resolution of high-risk states. For example, the ebb and flow of the wish to live relative to the wish to die signals the recovery process among suicidal patients receiving some treatments but not others [35]. In addition, certain temporal sequences observed in social media content differentiates users who die by suicide from those who do not [36]. These findings suggest that attention to both content and process will be essentially for understanding the various pathways to suicidal behavior.

Conclusion

Ideation-to-action theories have meaningfully advanced understanding of suicide. In particular, accumulating evidence suggests that pain, hopelessness, and related variables motivate suicidal desire, whereas capability for suicide helps differentiate attempters from ideators. While there are myriad opportunities for additional advancement, we conclude with two key future directions. First, more research is needed to better understand the causes of suicide ideation, attempts, and death. In particular, we recommend micro-longitudinal studies that examine changes in theoretical constructs and suicide ideation and behavior over periods of weeks, days, and hours (e.g. [36]), rather than months and years. Many of the factors highlighted by recent theories may operate on time-frames similar to 'thirst', which is a meaningful motivator of water drinking in the shorter term but would fail empirical tests hypothesizing effects of current thirst on water drinking one year later. Perhaps this is one reason why long-term studies of suicide find poor prediction [2•]. Second, the empirically supported aspects of ideation-to-action theories should be incorporated into intervention and prevention efforts. The vision articulated by Anestis *et al.* [37•] provides a wonderful example of how ideation-to-action theories can be applied to save lives.

Conflict of interest statement

Nothing declared.

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References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- • of special interest
- •• of outstanding interest

1. • Klonsky ED, May AM, Saffer BY: **Suicide, suicide attempts, and suicidal ideation**. *Annu Rev Clin Psychol* 2016, **12**:307-330.
Includes a description of and rationale for the ideation-to-action framework, as well as a table summarizing three (IPTS, IMV, 3ST) ideation-to-action theories.

2. • Franklin JC, Ribeiro JD, Fox KR, Bentley KH, Kleiman EM, Huang X, Musacchio KM, Jaroszewski AC, Chang BP, Nock MK: **Risk factors for suicidal thoughts and behaviors: a meta-analysis of 50 years of research**. *Psychol Bull* 2017, **143**:187-232.
Comprehensive review of longitudinal studies predicting suicidality outcomes that helps establish the poor predictive utility of commonly cited risk factors.

3. Klonsky ED, May AM: **Differentiating suicide attempters from suicide ideators: a critical frontier for suicidology research**. *Suicide Life Threat Behav* 2014, **44**:1-5.

4. Have MT, De Graaf R, Van Dorsselaer S, Verdurmen J, van't Land H, Vollebergh W, Beekman A: **Incidence and course of suicidal ideation and suicide attempts in the general population**. *Can J Psychiatry* 2009, **54**:824-833.

5. Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, Bruffaerts R, Chiu WT, De Girolamo G, Gluzman S, De Graaf R: **Cross-national prevalence and risk factors for suicidal ideation, plans and attempts**. *Br J Psychiatry* 2008, **192**:98-105.

6. Kessler RC, Borges G, Walters EE: **Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey**. *Arch Gen Psychiatry* 1999, **56**:617-626.

7. • May AM, Klonsky ED: **What distinguishes suicide attempters from suicide ideators? A meta-analysis of potential factors**. *Clin Psychol Sci Pract* 2016, **23**:5-20.
Helps establish that commonly cited risk factors — including depression and hopelessness — tend to be robust predictors of ideation but weaker predictors of attempts among ideators.

8. •• Klonsky ED, Qiu T, Saffer BY: **Recent advances in differentiating suicide attempters from suicide ideators**. *Curr Opin Psychiatry* 2017, **30**:15-20.
Provides evidence that diverse indices of the capability for suicide can distinguish attempters from ideators better than commonly cited risk factors.

9. Joiner TE: *Why People Die by Suicide*. Cambridge: Harvard University Press; 2005.

10. Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner TE: **The interpersonal theory of suicide**. *Psychol Rev* 2010, **117**:575-600.

11. • Ma J, Batterham PJ, Calear AL, Han J: **A systematic review of the predictions of the Interpersonal–Psychological Theory of Suicidal Behavior**. *Clin Psychol Rev* 2016, **46**:34-45.
Scoping review of evidence for the Interpersonal Theory of Suicide.

12. Rimkeviciene J, Hawgood J, O'Gorman J, De Leo D: **Construct validity of the acquired capability for suicide scale: factor structure, convergent and discriminant validity**. *J Psychopathol Behav Assess* 2017, **39**:291-302.

13. Stewart SM, Eaddy M, Horton SE, Hughes J, Kennard B: **The validity of the interpersonal theory of suicide in adolescence: a review**. *J Clin Child Adolesc Psychol* 2017, **46**:437-449.

14. O'Connor RC: **Towards an integrated motivational–volitional model of suicidal behaviour**. In *International Handbook of Suicide Prevention: Research, Policy and Practice*. Edited by O'Connor RC, Platt S, Gordon J. 2011:181-198.

15. Dhingra K, Boduszek D, O'Connor RC: **Differentiating suicide attempters from suicide ideators using the Integrated Motivational–Volitional model of suicidal behaviour**. *J Affect Disord* 2015, **186** 211–8.X.

16. Dhingra K, Boduszek D, O'Connor RC: **A structural test of the Integrated Motivational–Volitional model of suicidal behaviour**. *Psychiatry Res* 2016, **239**:169-178.

17. Tucker RP, O'Connor RC, Wingate LR: **An investigation of the relationship between rumination styles, hope, and suicide ideation through the lens of the integrated motivational–volitional model of suicidal behavior**. *Arch Suicide Res* 2016, **20**:553-566.

18. • Klonsky ED, May AM: **The three-step theory (3ST): a new theory of suicide rooted in the "ideation-to-action" framework**. *Int J Cogn Ther* 2015, **8**:114-129.
Introduces the most recent ideation-to-action theory of suicide.

19. Dhingra K, Klonsky E.D., Tapola V. An empirical test of the Three-Step Theory (3ST) of suicide in U.K. university students. Suicide Life-Threat Behav (acceptance pending).

20. May AM, Klonsky ED: **Assessing motivations for suicide attempts: development and psychometric properties of the inventory of motivations for suicide attempts**. *Suicide Life-Threat Behav* 2013, **43**:532-546.

21. • May AM, O'Brien KHM, Liu RT, Klonsky ED: **Descriptive and psychometric properties of the inventory of motivations for suicide attempts (IMSA) in an inpatient adolescent sample**. *Arch Suicide Res* 2016, **20**:476-482.
Finds that pain and hopelessness motivate suicide attempts in adolescents more than other factors including low belongingness, perceived burdensomeness, and help-seeking — which parallels findings in adult samples and is consistent with the Three-Step Theory.

22. Rappaport LM, Flint J, Kendler KS: **Clarifying the role of neuroticism in suicidal ideation and suicide attempt among women with major depressive disorder**. *Psychol Med* 2017.

23. Wintersteen MB: *A retrospective account of youth suicide warning signs and its impact on prevention efforts*. Presented at Annu Meet Assoc Cogn Behav Ther 48th Philadelphia; 2014.

24. Rudd MD: **Fluid vulnerability theory: a cognitive approach to understanding the process of acute and chronic risk**. In *Cognition and Suicide: Theory, Research, and Therapy*. Edited by Ellis TE. Washington, DC: American Psychological Association; 2006.

25. Beck AT: **Beyond belief: a theory of modes, personality, and psychopathology**. In *Frontiers of Cognitive Therapy*. Edited by Salkovskis PM. New York, NY: Guilford Press; 1996.

26. Rudd MD: **The suicidal mode: a cognitive-behavioral model of suicidality**. *Suicide Life-Threat Behav* 2000, **30**:18-33.

27. Bryan CJ *et al.*: **Improving the detection and prediction of suicidal behavior among military personnel by measuring suicidal beliefs: an evaluation of the Suicide Cognitions Scale**. *J Affective Disord* 2014, **159**:15-22.

28. Bryan CJ, Kanzler KE, Grieser E, Martinez A, Allison S, McGeary D: **A shortened version of the Suicide Cognitions Scale for identifying chronic pain patients at risk for suicide**. *Pain Pract* 2017, **17**:371-381.

29. Ellis TE, Rufino KA: **A psychometric study of the Suicide Cognitions Scale with psychiatric inpatients**. *Psychol Assess* 2015, **27**:82-89.

30. Bryan CJ, Rozek DC: **Suicide prevention in the military: a mechanistic perspective**. *Curr Opin Psychol* 2017.

31. Bryan CJ, Wood DS, May A, Peterson AL, Wertenberger E, Rudd MD: **Mechanisms of action contributing to reductions in suicide attempts following brief cognitive behavioral therapy for military personnel: a test of the interpersonal-psychological theory of suicide**. *Arch Suicide Res* 2017.

32. • Bryan CJ, Rudd MD: **The importance of temporal dynamics in the transition from suicidal thought to behavior**. *Clin Psychol: Sci Pract* 2016, **23**:21-25.
Elaborates on how temporal dynamics and fluid-vulnerability theory can advance the study and understanding of suicide.

33. Bryan CJ, Rudd MD, Nonlinear change processes during psychotherapy characterize patients who have made multiple suicide attempts: *Suicide Life-Threat Behav* 2017.

34. Bryan CJ, Butner JE, Sinclair S, Bryan AO, Hesse CM, Rose AE: **Predictors of emerging suicide death among military personnel on social media networks**. *Suicide Life Threat Behav* 2017.

35. Bryan CJ, Rudd MD, Peterson AL, Young-McCaughan S, Wetenberger E: **The ebb and flow of the wish to live and the wish to die among suicidal military personnel**. *J Affective Disord* 2016, **202**:58-66.

36. Kleiman EM, Turner BJ, Fedor S, Beale EE, Huffman JC, Nock MK: **Examination of real-time fluctuations in suicidal ideation and its risk factors: results from two ecological momentary assessment studies**. *J Abnorm Psychol* 2017.

37. • Anestis MD, Law KC, Jin H, Houtsma C, Khazem LR, Assavedo BL: **Treating the capability for suicide: a vital and understudied frontier in suicide prevention**. *Suicide Life-threat Behav* 2016.
Important vision of how ideation-to-action theories of suicide can inform and guide suicide prevention.