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A Test of the Three-Step Theory of Suicide among Chinese People: A Study Based on
the Ideation-to-Action Framework

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Abstract

The aim of this study was to test the Three-Step Theory (3ST) of Suicide in a sample of college students in China ($N=1097$). All participants completed a battery of questionnaires indexing psychological pain, hopelessness, connectedness, suicide capacity, suicide ideation, and suicide attempt. The prevalence of suicide ideation and suicide attempt among the sample were 21.42% and 3.83%, respectively. The hierarchical regression analysis showed that psychological pain and hopelessness interacted to predict suicide ideation, and that connectedness was the most protective against ideation in those high on both pain and hopelessness. Suicide capacity differentiated attempters from ideators above and beyond current suicide ideation. These findings provide preliminary evidence for the validity of 3ST of suicide within the Chinese contexts. Implications for suicide prevention and intervention and future research directions are also discussed.

Keywords: suicidal behavior; suicide ideation; suicide attempt; China; three-step theory; 3ST; ideation-to-action framework

A Test of the Three-Step Theory of Suicide among Chinese People: A Study Based on the Ideation-to-Action Framework

Suicidal behavior is more than just a serious public health problem; in fact each completed suicide has a continuing ripple effect, affecting the lives of families and friends dramatically and resulting in huge economic, social, and psychological burden for communities, cities, and even the whole countries. Suicide is among the top 20 leading causes of death worldwide, accounting for about 788,000 in 2015 (World Health Organization [WHO], 2017). A much larger number of people attempt suicide, estimating that there are likely to have been more than 20 suicide attempts for each completed suicide (WHO, 2016). The number of people who consider suicide is even greater; a survey across 17 countries found that the cross-national lifetime prevalence of suicide ideation is as high as 9.2% (Nock et al., 2008).

Suicidal behavior includes thoughts about suicide, attempts ranging from low lethality to medically serious, and deaths by suicide (Crosby, Ortega, & Melanson, 2011; Posner, Oquendo, Gould, Stanley, & Davies, 2007; Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007a). The aetiology of suicidal behavior is complex, encompassing several interacting factors – personal, social, psychological, cultural, biological, and environmental (Shneidman, 1988; WHO, 2014). However, suicidal behavior is perhaps most directly affected by psychological factors, because people make a conscious decision to try to end their own lives (O'Connor & Nock, 2014). Despite a wide range of psychological models guiding suicide research and prevention intervention (e.g., psychache, escape from aversive self-awareness, defeat

and the sense of entrapment), the narrow and exclusive focus of most approaches has greatly limited their clinical and practical utility (Rudd, 2000; Franklin et al., 2017). Moreover, with only a few exceptions, these models have not been particularly successful in distinguishing those who have experienced ideation without attempts from those who have made suicide attempts or killed themselves (Klonsky, May, & Saffer, 2016).

It is becoming increasingly clear that most oft-cited risk factors for suicide (e.g., depression, hopelessness, and impulsivity) are actually risk factors for suicide ideation, and not for progression from suicide ideation to attempts (Glenn & Nock, 2014; Klonsky et al., 2016; Klonsky & May, 2014). Although suicide ideation is a well-documented risk factor for suicide attempt and completed suicide, the majority of those with suicidal thoughts do not go on to make a suicide attempt (Nock et al., 2008; ten Have et al., 2009). Thus, it becomes crucial that the suicide theories offer a better understanding of suicide risk, especially the progression from suicide ideation to attempt (Klonsky et al., 2016). Klonsky and May (2014) proposed that “an ideation-to-action framework should guide all suicide research and theory” (p. 3), and they noted that “(a) the development of suicidal ideation and (b) progression from suicide ideation to attempts should be viewed as distinct processes with distinct predictors and explanations” (Klonsky & May, 2015, p. 115). The traditional approach treats suicide risk as a unitary construct, while the ideation-to-action framework distinguishes predictors of ideation from predictors of the progression from ideation to behavior (Klonsky et al., 2016).

The Interpersonal Theory of Suicide (ITS) initially proposed by Tomas E. Joiner Jr. is viewed as the first ideation-to-action theory of suicide (Joiner, 2005; Klonsky & May, 2015). The ITS proposes explanations for suicidal desire and for acting on suicidal desire. In particular, the theory states that perceived burdensomeness and low belongingness combine to create suicidal desire, whereas the capability to act on desire is acquired over time through exposure to painful and provocative events (Van Orden et al., 2010). The Integrated Motivational-Volitional Model of Suicide Behavior (IMV) proposed by Rory C. O'Connor represents the second ideation-to-action theory (Dhingra, Boduszek, & O'Connor, 2016; O'Connor, 2011). The IMV suggests the motivational phase describes the factors that govern the development of suicide ideation and intent (mainly defeat and entrapment), whereas the volitional phase outlines the factors that determine whether an individual attempts suicide (e.g., access to lethal means, the capability to attempt suicide, and impulsivity). The Three-Step Theory (3ST) of suicide is the most recent of suicide theory rooted in the ideation-to-action framework (Klonsky & May, 2015). The 3ST provides a parsimonious and testable model in which suicide ideation and attempts are explained in terms of just four factors: pain, hopelessness, connectedness, and suicide capacity.

The 3ST regards the development of suicide ideation and the progression from ideation to attempts as distinct processes that require distinct explanations (Klonsky et al., 2016). The theory suggests that the first step toward suicide ideation begins with the combination of pain (usually psychological pain) and hopelessness. The second step toward potentially lethal suicidal behavior occurs when pain exceeds or

overwhelms connectedness. Connectedness prevents suicide ideation from escalating in intensity in those experiencing both pain and hopelessness. The final step suggests that strong suicide ideation leads to a suicide attempt or completed suicide when one has the suicide capacity.

The 3ST expands upon the ITS concept of acquired capability to include dispositional and practical contributors to capability. Dispositional contributors refer to a genetic predisposition for high pain tolerance and low fear of death (Houtsma & Anestis, 2017; Klonsky et al., 2016). Acquired contributors refer to the very same construct conceptualized by Joiner, which is acquired largely through repeated exposure to painful or fearsome experiences that result in a habituation to pain and an increased fearlessness about death (Joiner et al., 2009). Practical contributors refer to concrete factors that make a suicide attempt easier, such as access to the lethal means (Klonsky & May, 2015). There are two points which need to be clarified. Firstly, despite emphasis on pain, hopelessness, connectedness, and suicide capacity, the 3ST is not meant to suggest that other traditional risk factors for suicidal behaviors are irrelevant, as Klonsky and May (2015) argue that “they are relevant in a specific way, through their effects on pain, hopelessness, and/or connectedness” (p. 118). Secondly, consistent with Joiner’s ITS, the 3ST explains that an individual must be capable of engaging in suicidal behavior to make an attempt. So far the core factors of the theory have attracted considerable attention and the theory has also been supported by recent research in Western countries (e.g., Dhingra, Klonsky, & Vojna, 2017; Klonsky & May, 2015).

Suicide in China has received increasing attention in recent years, especially since Phillips, Li, and Zhang (2002) indicated that the mean annual suicide rate was as high as 23 per 100 000. Based on mortality data in late 1990s, China is widely recognized to have one of the highest suicide rates across the world. With the rapid economic growth and strong urbanization process over the past two decades, mainland China has experienced a steady decline in the overall suicide rate (Sun, Guo, Zhang, Jia, & Xu, 2013; Wang, Chan, & Yip, 2014; Yip, Liu, Hu, & Song, 2005). The annual national age-standardized suicide rate in China was 7.8 per 100,000 population in 2012 (7.1 for males and 8.7 for females), which has declined by 59.6% ever since 2000 (WHO, 2014). However, more and more scholars have expressed their concerns about downward trajectory of the suicide rate in China. The decline in the suicide rate may reverse over the next decade because of the social stresses associated with the slowdown of economic growth, the rapid aging of the population, increased economic burdens, and income inequality (Sha, Yip, & Law, 2017; Wang et al., 2014; Xie & Zhou, 2014).

It is imperative for Chinese society to have a better understanding of suicidal behavior. Recently, some scholars in China have paid their attention to the contribution of cultural factors to suicidal behaviors (e.g., Li, Phillips, & Cohen, 2012; Yip, Yousuf, Chan, Yung, & Wu, 2015; Zhang, Liu, & Sun, 2017). Chinese society places high value on social cohesion (Lee, Tsang, Li, Phillips, & Kleinman, 2007), and Chinese people are very collectivistic within the family relationships and family clans (Zhang, Conwell, Zhou, & Jiang, 2004). Consistent with Chinese culture, the

3ST of suicide also emphasizes the role of the interpersonal relationship (i.e. connectedness) in the development of suicidal desire (Klonsky & May, 2015). Connectedness can be a protective factor of suicidal behaviors, while disrupted connectedness may be a risk factor. The current study aims to test the 3ST among Chinese college students. It is helpful for Chinese society to better understand suicide behaviors rooted in the ideation-to-action framework. It also can provide preliminary evidences for suicide prevention and intervention. According to the 3ST, the key hypotheses we test are:

- (1) Pain and hopelessness will interact to predict current suicide ideation;
- (2) Connectedness protects against escalation of suicide ideation among those high on both pain and hopelessness;
- (3) Suicide capacity will distinguish lifetime suicide attempters from those with histories of ideation but not attempts.

METHOD

Participants

Participants were from three large, public universities in the city of Tianjin in eastern coastal region of the People's Republic of China. A total of 1150 undergraduate students attended a session to complete the questionnaires. 1097 completed all question items designed for this study and were therefore included in the final dataset for analyses. The response rate was 95.4%. The final sample consisted of 481 men and 594 women (22 with missing data for gender). The age of the participants ranged from 16 to 25 (mean = 19.77, SD = 1.67). The sample was

predominantly Han ethnicity (90.0%). The remaining participants were from a number of different ethnic minorities. All participants were native Chinese speakers.

Measures

The Psychache Scale (PAS). The PAS is a 13-item scale that measures current emotional or mental pain as conceptualized by Shneidman (1993). Holden, Mehta, Cunningham and McLeod (2001) have indicated that the PAS has good psychometric properties. We used the Chinese version of the PAS (Yang & Chen, 2017). In this sample, the Cronbach's alpha was 0.90.

The Beck Hopelessness Scale (BHS). The BHS is a 20-item scale that assesses hopelessness within the past two weeks (Beck, Weissman, Lester, & Trexler, 1974). The Chinese version of the BHS had been validated and proved to be a good measurement in Chinese people (Kong, Zhang, Jia, & Zhou, 2007). In this sample, the Cronbach's alpha was 0.84.

The Interpersonal Need Questionnaire (INQ). The INQ is a 12-item scale that measures current beliefs about the extent to which they feel connected to others (i.e., belongingness) and the extent to which they feel like a burden on the people in their lives (i.e., perceived burdensomeness) (Van Orden, Witte, Gordon, Bender, & Joiner, 2008). We used the Chinese version of the INQ (Li, 2014). In this sample, the Cronbach's alpha was 0.88.

The Beck Scale for Suicide Ideation (BSS). The self-report version of BSS is a widely used 19-item scale that measures suicide ideation (Beck, Kovacs, & Weissman, 1979). If participants give a nonzero rating on item 4 or 5 of the BSS, they complete

the remaining 14 items. Otherwise, they are instructed to skip the remaining items and assigned 0 as their score for suicide ideation (Steer, Rissmiller, Ranieri, & Beck, 1993). The Chinese version of the BSS has demonstrated good reliability and validity (Li et al., 2010). In this sample, the Cronbach's alpha was 0.75.

The Acquired Capability for Suicide Scale- Fearlessness about Death (ACSS-FAD). The ACSS-FAD is a 7-item scale that examines the degree of fearlessness of death (Ribeiro et al., 2014). The Chinese version of the ACSS-FAD was used (Li, 2014). In this sample, the Cronbach's alpha was 0.76.

The Suicide Capacity Scale (SCS). The SCS is a 6-item scale that measures suicide capacity including dispositional, acquired, and practical contributors (Klonsky & May, 2015). The SCS was translated into Chinese with the permission of David Klonsky and back-translated to check for accuracy. In this sample, the Cronbach's alpha was 0.71.

The Suicide Attempt Measurement. Suicide attempt was defined as a self-inflicted, potentially injurious behavior with a non-fatal outcome for which there is evidence (either explicit or implicit) of intent to die (Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007b). The following item, which was taken from You et al., 2014, was to assess suicide attempt history: "have you ever attempted to kill yourself in your life". The item was rated on a 3-point Likert scale (0, never; 1, sometimes; 2, very often). Participants who answered with "0" were regarded as "without suicide attempt", and otherwise regarded as "with suicide attempt".

Procedure

All study procedures were reviewed and approved by the institutional ethics panel of Tianjin University. Participants were invited to participate in a study of suicide in their introductory psychology course. Surveys were administered to the participants during regular class hours. All the students were provided with informed consent. Clear instructions and information about the purpose of the study were given. It was made clear that they didn't need to have experienced suicidal behaviors to take part, and anonymity and confidentiality were assured on the consent form. All participants ($N=1097$) completed all the measures described above. It took approximately 20 minutes to complete the survey. All participants received a notebook as a gift for participating in the study.

RESULTS

General Description

Table 1 illustrated the descriptive statistics and correlations for the key study variables. Of the total students, 21.42% (235) participants reported the presence of suicide ideation and 3.83% (42) reported a history of suicide attempt at some point of their lifetime.

Psychological Pain and Hopelessness Interact to Predict Suicide Ideation

Firstly, because many participants (78.58%) rated 0 on BSS, a square-root transformation was computed for suicide ideation (Hamilton, 2009). In addition, the psychological pain and hopelessness were centered to reduce the effect of multicollinearity (Frazier, Tix, & Barron, 2004).

Next, we conducted a hierarchical regression analysis to determine whether psychological pain and hopelessness independently and interactively predicted suicide ideation. The first variable to enter equation was psychological pain, followed by hopelessness as the second step. Finally, to test for the interaction, we entered the multiplicative term of psychological pain \times hopelessness in the final step of the equation. In the final model, psychological pain ($\beta = .12, p = .002, 95\% \text{ CI } [.04, .19]$), hopelessness ($\beta = .21, p < .001, 95\% \text{ CI } [.15, .27]$), and the interaction term ($\beta = .12, p < .001, 95\% \text{ CI } [.05, .18]$) each independently predicted suicide ideation. The full model accounted for 12% of the variance in suicide ideation. Specially, the interaction term itself explained an additional 1% of the variance over and above the main effects (Table 2).

Then, median splits were utilized to create low and high subgroups for psychological pain and hopelessness to illustrate the potential clinical significant of the interaction pattern. We trichotomize the participants into three distinct subgroups: low psychological pain and hopelessness ($n = 326, 29.72\%$), either high psychological pain or high hopelessness ($n = 375, 34.18\%$), and both high psychological pain and high hopelessness ($n = 396, 36.10\%$). One-way ANOVA test and post-hoc analysis with Bonferroni adjustment indicated that the suicide ideation in both high psychological pain and high hopelessness subgroup was substantially higher than that in the other two groups ($F = 33.78, p < .001$) (Figure 1).

We also examined whether the interaction effect between psychological pain and hopelessness would remain consistent across different demographic groups. The

interaction was statistically reliable in both men ($\beta = .12, p = .018, 95\% \text{ CI } [.02, .21], n = 481$) and women ($\beta = .13, p = .006, 95\% \text{ CI } [.04, .24], n = 594$).

Finally, we compared the first step of the 3ST with the Interpersonal Theory of Suicide (Joiner, 2005). The ITS proposes that thwarted belongingness and perceived burdensomeness interact to explain suicide ideation (Van Orden et al., 2010). In the current sample, belongingness and burdensomeness interacted significantly to predict suicide ideation ($\beta = .12, p < .001, 95\% \text{ CI } [.06, .18]$), and the full model accounted for 12% of the variance in suicide ideation which was almost the same as the first step of 3ST.

Connectedness Protects against Escalation of Suicide Ideation among Those High on both Psychological Pain and Hopelessness

We used the belongingness subscale of INQ to assess connectedness (Van Orden et al., 2008). Consistent with the 3ST of suicide, connectedness may protect against increasing the risk level of suicide ideation among those with both high pain and high hopelessness.

Firstly, we tested whether the relationship of connectedness and suicide ideation is particularly robust in the subgroup of participants both high on psychological pain and hopelessness. Thus, we dichotomized the participants into two subgroups: both high psychological pain and high hopelessness, and others. Furthermore, because the belongingness subscale assesses the level of preserved thwarted belongingness, we reversed the original scores to represent the level of connectedness. It is noteworthy that the correlation coefficient of connectedness and suicide ideation was stronger for

the high psychological pain and high hopelessness subgroup ($r = -.28, p < .001, n = 396$) compared to others ($r = -.14, p < .001, n = 701$).

Next, we examined whether connectedness could protect against escalation of suicide ideation among individuals with combined psychological pain and hopelessness when connectedness exceeds psychological pain. We standardized psychological pain and connectedness, and created a difference variable, P—C, by subtracted connectedness from psychological pain (Klonsky & May, 2015). Thus, positive value meant that psychological pain exceeds connectedness, whereas negative value meant that connectedness exceeds psychological pain. As expected, the relationship of P—C with suicide ideation was $r = .34$ ($p < .001$) in the subgroup with both high Psychological Pain and high Hopelessness, compared to just $r = .12$ ($p = .002$) in others.

Suicide Capacity Distinguish Lifetime Suicide Attempters from Those with Histories of Ideation but Not Attempts.

The Chinese version of the ACSS-FAD and SCS were both used to measure suicide capacity. First, we coded participants with histories of suicide ideation but not attempts as 0, and participants with histories of suicide attempts as 1. Then, t test were utilized to compare suicide capacity between individuals with histories of suicide ideation but not attempts ($n = 193$) and individuals with histories of suicide attempts ($n = 42$). The SCS differentiated the ideation and attempt subgroups ($t = 3.03$, Cohen's $d = .52, p = .003$, 95% CI [1.18, 5.53]). In particular, practical contributors to suicide capacity differentiated ideators and attempters ($t = 3.30$, Cohen's $d = .56, p$

= .001, 95% CI [.81, 3.20]). However, dispositional and acquired contributors to suicide capacity and ACSS-FAD did not significantly differentiate attempters from ideators.

Next, a binary logistic regression was used to assess the statistical predictive power of pain, hopelessness, thwarted belongingness, perceived burdensomeness, and suicide capacity on suicide attempt. It indicated that only the practical contributors to suicide capacity significant predicted lifetime suicide attempt even when controlling for current suicide ideation (Table 3).

DISCUSSION

The present study aimed to test the Three-Step Theory (3ST) of suicide among college students in China using a large sample from three universities. To our knowledge, this is the first study to examine 3ST rooted in the ideation-to-action framework within the Chinese contexts. Overall, the present study provided partial support for the validity of the 3ST among Chinese people.

In this study, the prevalence of suicide ideation and suicide attempt among college students in China were 21.42% and 3.83%, respectively. In the previous studies, the prevalence of suicide ideation was mainly above 15% among Chinese adolescents (e.g., Liu, Tein, Zhao, & Sandler, 2005; Sun et al., 2017). A study in urban China showed that the lifetime prevalence of suicide ideation and suicide attempt was 3.1% and 1.0%, respectively (Lee et al., 2007). Thus, college students have higher suicide ideation than community samples. High risk of suicidal behaviors among Chinese adolescents may be due to school pressure and academic achievement

stress that come from peer competition for score ranks and scholarship qualification.

The first hypothesis as well as the first step of the 3ST, that suicide ideation is driven by the combination of pain and hopelessness, was moderately supported among Chinese people. Psychological pain and hopelessness not only independently, but also interactively predicted suicide ideation across different genders. Pain and hopelessness in combination were what lead to suicide ideation. However, the overall predictive value ($R^2 = 12\%$) of the regression model was much lower than the previous studies in Western countries (e.g. Dhingra et al., 2017; Klonsky & May, 2015); in addition, the model including psychological pain, hopelessness, and their interaction did not explained more variability in suicide ideation than the model proposed by the Interpersonal Theory of Suicide (Joiner, 2005; Van Orden et al., 2010). The relatively small number of suicide attempters in the current study may contribute to the discrepancy in the explanatory power of the first step of 3ST on the suicide ideation. The prevalence of suicide attempt in the sample was 3.83%, which was much smaller than the previous studies (e.g., 14% among adults in the United State, and 24% among university students in the United Kingdom). Wu, Chen, Yu, Duan, and Jiang (2015) found that psychological pain and hopelessness explained 29% more variability in suicide ideation among participants with histories of suicide attempts than those only with histories of suicide ideation. Future studies are needed to replicate this finding in diverse samples to reach strong conclusions in China.

Consistent with the second hypothesis of the theory, the present study indicated that the connectedness played an important protective role against escalation of

suicide ideation among those high on both pain and hopelessness. Moreover, we created a difference variable indexing the extent to which pain exceeds connectedness in the present study. As predicted by the 3ST, it robustly predicted ideation in the combined pain and hopelessness subgroup but was a weaker predictor of ideation in others. The results supported the findings of Klonsky and May (2015), whereas they were inconsistent with the recent empirical test of the 3ST among the U.K. university students, which failed to indicate that the relationship between connectedness and suicide ideation among the participants high on both pain and hopelessness was stronger than everyone else (Dhingra et al., 2017). Given that Chinese society tends to be more interdependent and connected than Western mainstream culture (Townsend & McWhirter, 2005), connectedness probably played a much more important role in protecting individuals at heightened risk for suicidal behaviors within the Chinese contexts.

The third hypothesis was partly supported in the present study. In line with 3ST, psychological pain, hopelessness, thwarted belongingness, and perceived burdensomeness did not statistically predict suicide attempt over and above suicide ideation. Results indicated that suicide capacity robustly distinguished suicide ideators and suicide attempters. Specially, practical variables turned to be a strong and stable predictor of suicide attempt when controlling for current suicide ideation. However, acquired variables failed to distinguish those with a history of suicide attempt from those with a history of suicide ideation only. The result was inconsistent with the previous studies (e.g., Smith, Stanley, Joiner, Sachs-Ericsson, & Van Orden, 2016;

Van Orden et al., 2008). The results may suggest a unique pattern of suicidal behaviors in China. Practical variables refers to concrete factors that make a suicide attempt easier, such as access to lethal means and related knowledge (Klonsky & May, 2015). Pesticide self-poisoning is the leading method of suicide in China (Yang et al., 2005; Zhang, 1996). Specifically, the ready availability of pesticides at home as well as the high lethality makes it easier to attempt suicide among Chinese rural people (Sun et al., 2013; Wang et al., 2014). Future research could address whether specific populations known to have elevated rates of suicidal behaviors, such as physicians, also evidence higher levels of practical suicide capacity.

The results of our study may provide some implications for suicide prevention and intervention strategies in China. Consistent with 3ST, in order to reduce suicide risk, we can reduce pain (especially psychache), increase hope, improve interpersonal relationship, and/or reduce suicide capacity. Within the Chinese contexts, firstly, connectedness should be particularly emphasized. Connectedness with spouse, family, and friends could buffer the suicide ideation, while disrupted connectedness such as interpersonal conflicts, especially the conflict with spouse could be the most important reasons or triggers for the Chinese suicides (Li et al., 2012). Secondly, restricting access to lethal suicide methods is one of the most effective suicide prevention strategies (Mann et al., 2005). Thus, inspection and administration in the use and sale of pesticides should be strengthened by government. A possible intervention may be redesigning the formulations of pesticides, for example, less access to concentrated toxic pesticides, and inclusion of vomit inducing substances

with pesticide mixtures (Yang et al., 2005; Zhang et al., 2008). In addition, the use of community-based or household-based lockboxes (so they are not stored in every home and difficult to get) can effectively reduce suicidal behavior (Weerasinghe et al., 2008).

The current study, although consistent with 3ST, was limited by several factors that suggest directions for future research. As stated above, all of our results are cross-sectional. Although the current study does provide evidence of pain, hopelessness, connectedness, and suicide capacity as nonspurious correlates of suicidal behaviors, the case for causality is weakened without evidence for temporal precedence. Longitudinal data will be especially useful for examining whether higher suicide capacity predicts transition to suicide attempt among those with suicide ideation. Another limitation is our use of proxy variables for some of the constructs (e.g., thwarted belongings for disrupted connectedness). According to the 3ST, connectedness means connection to other people as well as to an interest, role, project, or any sense of purpose or meaning that keeps one invested in living (Klonsky & May, 2015). The belongingness subscale of INQ only measures the connectedness to other people, which couldn't accurately reflect the thorough extent of connectedness. Future research should develop new measures specifically designed to assess the constructs of 3ST. An additional limitation involves the sample. We tested the theory in a nonclinical population with the relatively small number of suicide attempters in China. The sample likely had less severe psychopathology and suicide ideation as compared to an outpatient or inpatient sample. Future research should reconfirm the theory in

clinical settings.

In closing, the present study sought to test the validity of the Three-Step Theory (3ST) of suicide within the Chinese contexts. The results indicated that pain and hopelessness independently and interactively predict suicide ideation, and that connectedness particularly protects against suicide ideation among those with both high pain and high hopelessness. The suicide capacity differentiated attempters from ideators and only the practical contributors to suicide capacity predicts suicide attempts above and beyond current suicide ideation.

REFERENCES

- Beck, A. T., Kovacs, M., & Weissman, A. (1979). Assessment of suicidal intention: The Scale for Suicide Ideation. *Journal of Consulting and Clinical Psychology*, 47(2), 343-352
- Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The Hopelessness Scale. *Journal of Consulting and Clinical Psychology*, 42(6), 861-865
- Crosby, A., Ortega, L., & Melanson, C. (2011). *Self-directed Violence Surveillance: Uniform definitions and recommended data elements (Version 1.0)*. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.
- Dhingra, K., Boduszek, D., & O'Connor, R. C. (2016). A structural test of the Integrated Motivational-Volitional model of suicidal behaviour. *Psychiatry Research*, 239, 169-178. doi: 10.1016/j.psychres.2016.03.023
- Dhingra, K., Klonsky, E. D., & Vojna, T. (2017 - in press). An empirical test of the Three-Step Theory (3ST) of suicide in U.K. university students. *Suicide and Life-Threatening Behavior*
- Franklin, J. C., Ribeiro, J. D., Fox, K. R., Bentley, K. H., Kleiman, E. M., Huang, X.,... Nock, M. K. (2017). Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological Bulletin*, 143(2), 187-232. doi: 10.1037/bul0000084
- Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology*, 51(1), 115-134. doi: 10.1037/0022-0167.51.1.115
- Glenn, C. R., & Nock, M. K. (2014). Improving the short-term prediction of suicidal behavior. *American Journal of Preventive Medicine*, 47(3), S176-S180. doi: 10.1016/j.amepre.2014.06.004
- Hamilton, L. C. (2009). *Statistics with STATA: Updated for version 10*. Belmont, CA: Cengage Learning.
- Holden, R. R., Mehta, K., Cunningham, E. J., & McLeod, L. D. (2001). Development and preliminary validation of a scale of psychache. *Canadian Journal of Behavioural Science*, 33(4), 224-232
- Houtsma, C., & Anestis, M. D. (2017). Practical capability: The impact of handgun ownership among suicide attempt survivors. *Psychiatry Research*, 258, 88-92. doi: 10.1016/j.psychres.2017.09.064
- Joiner Jr., T. E. (2005). *Why people die by suicide*. Cambridge, MA: Harvard University Press.
- Joiner Jr., T. E., Van Orden, K. A., Witte, T. K., Selby, E. A., Ribeiro, J. D., Lewis, R.,... Rudd, M. D. (2009). Main predictions of the Interpersonal-Psychological Theory of Suicidal Behavior: Empirical tests in two samples of young adults. *Journal of Abnormal Psychology*, 118(3), 634-646
- Klonsky, E. D., May, A. M., & Saffer, B. Y. (2016). Suicide, suicide attempts, and suicidal ideation. *Annual Review of Clinical Psychology*, 12, 307-330
- Klonsky, E. D., & May, A. M. (2014). Differentiating suicide attempters from suicide ideators: A critical frontier for suicidology research. *Suicide and Life-Threatening Behavior*, 44(1), 1-5. doi: 10.1111/sltb.12068
- Klonsky, E. D., & May, A. M. (2015). The Three-Step Theory (3ST): A new theory of suicide rooted in the "ideation-to-action" framework. *International Journal of Cognitive Therapy*, 8(2SI), 114-129
- Kong, Y., Zhang, J., Jia, S., & Zhou, L. (2007). Reliability and validity of the Beck Hopelessness Scale for adolescent. *Chinese Mental Health Journal*, 21(10), 686-689
- Lee, S., Fung, S. C., Tsang, A., Liu, Z. R., Huang, Y. Q., He, Y. L.,... Kessler, R. C. (2007). Lifetime prevalence of suicide ideation, plan, and attempt in metropolitan China. *Acta Psychiatrica Scandinavica*, 116(6), 429-437. doi: 10.1111/j.1600-0447.2007.01064.x

- Lee, S., Tsang, A., Li, X. Y., Phillips, M. R., & Kleinman, A. (2007). Attitudes toward suicide among Chinese people in Hong Kong. *Suicide and Life-Threatening Behavior*, 37(5), 565-575. doi: 10.1521/suli.2007.37.5.565
- Li, X., Phillips, M. R., Tong, Y., Li, K., Zhang, Y., Zhang, Y.,.... Niu, Y. (2010). Reliability and validity of the Chinese version of Beck Suicide Ideation Scale (BSI-CV) in adult community residents. *Chinese Mental Health Journal*, 24(4), 250-255
- Li, X., Phillips, M. R., & Cohen, A. (2012). Indepth interviews with 244 female suicide attempters and their associates in Northern China: Understanding the process and causes of the attempt. *Crisis*, 33(2), 66-72. doi: 10.1027/0227-5910/a000108
- Li, Z. (2014). *The revision and application of the Acquired Capability for Suicide Scale*. (Master's thesis) Retrieved from <http://www.cnki.net/KCMS/detail/detail.aspx?FileName=1016192341.nh&DbName=CMFDTEMP>
- Liu, X., Tein, J., Zhao, Z., & Sandler, I. N. (2005). Suicidality and correlates among rural adolescents of China. *Journal of Adolescent Health*, 37(6), 443-451. doi: 10.1016/j.jadohealth.2004.08.027
- Mann, J. J., Apter, A., Bertolote, J., Beautrais, A., Currier, D., Haas, A.,.... Hendin, H. (2005). Suicide prevention strategies: A systematic review. *JAMA: Journal of the American Medical Association*, 294(16), 2064-2074. doi: 10.1001/jama.294.16.2064
- Nock, M. K., Borges, G., Bromet, E. J., Alonso, J., Angermeyer, M., Beautrais, A.,.... Williams, D. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *British Journal of Psychiatry*, 192(2), 98-105. doi: 10.1192/bjp.bp.107.040113
- O'Connor, R. C. (2011). Towards an integrated motivational - volitional model of suicidal behaviour. In R. C. O'Connor, S. Platt & J. Gordon (Eds.), *International handbook of suicide prevention: Research, policy and practice* (181-198). Chichester, UK: Wiley.
- O'Connor, R. C., & Nock, M. K. (2014). The psychology of suicidal behaviour. *The Lancet Psychiatry*, 1(1), 73-85. doi: 10.1016/S2215-0366(14)70222-6
- Phillips, M. R., Li, X., & Zhang, Y. (2002). Suicide rates in China, 1995 - 99. *The Lancet*, 359(9309), 835-840. doi: 10.1016/S0140-6736(02)07954-0
- Posner, K., Oquendo, M. A., Gould, M., Stanley, B., & Davies, M. (2007). Columbia Classification Algorithm of Suicide Assessment (C-CASA): Classification of suicidal events in the FDA's pediatric suicidal risk analysis of antidepressants. *American Journal of Psychiatry*, 164(7), 1035-1043. doi: 10.1176/appi.ajp.164.7.1035
- Ribeiro, J. D., Witte, T. K., Van Orden, K. A., Selby, E. A., Gordon, K. H., Bender, T. W.,.... Joiner, T. E. (2014). Fearlessness about death: The psychometric properties and construct validity of the revision to the Acquired Capability for Suicide Scale. *Psychological Assessment*, 26(1), 115-126. doi: 10.1037/a0034858
- Rudd, M. D. (2000). The suicidal mode: A cognitive-behavioral model of suicidality. *Suicide and Life-Threatening Behavior*, 30(1), 18-32
- Sha, F., Yip, P. S. F., & Law, Y. W. (2017). Decomposing change in China's suicide rate, 1990-2010: Ageing and urbanisation. *Injury Prevention*, 23(1), 40-45. doi: 10.1136/injuryprev-2016-042006
- Shneidman, E. S. (1988). Some reflections of a founder. *Suicide and Life-Threatening Behavior*, 18(1), 1-12
- Shneidman, E. S. (1993). Commentary: Suicide as psychache. *Journal of Nervous and Mental Disease*, 181(3), 145-147

- Silverman, M. M., Berman, A. L., Sanddal, N. D., O'Carroll, P. W., & Joiner Jr., T. E. (2007a). Rebuilding the Tower of Babel: A revised nomenclature for the study of suicide and suicidal behaviors part 1: Background, rationale, and methodology. *Suicide and Life-Threatening Behavior*, 37(3), 248-263
- Silverman, M. M., Berman, A. L., Sanddal, N. D., O'Carroll, P. W., & Joiner Jr., T. E. (2007b). Rebuilding the Tower of Babel: A revised nomenclature for the study of suicide and suicidal behaviors part 2: Suicide-related ideations, communications, and behaviors. *Suicide and Life-Threatening Behavior*, 37(3), 264-277. doi: 10.1521/suli.2007.37.3.264
- Smith, P. N., Stanley, I. H., Joiner, T. E., Sachs-Ericsson, N. J., & Van Orden, K. A. (2016). An aspect of the capability for suicide-fearlessness of the pain involved in dying-amplifies the association between suicide ideation and attempts. *Archives of Suicide Research*, 20(4), 650-662. doi: 10.1080/13811118.2016.1162245
- Steer, R. A., Rissmiller, D. J., Ranieri, W. F., & Beck, A. T. (1993). Dimensions of suicidal ideation in psychiatric inpatients. *Behaviour Research and Therapy*, 31(2), 229-236. doi: [https://doi.org/10.1016/0005-7967\(93\)90090-H](https://doi.org/10.1016/0005-7967(93)90090-H)
- Sun, J., Guo, X., Zhang, J., Jia, C., & Xu, A. (2013). Suicide rates in Shandong, China, 1991 – 2010: Rapid decrease in rural rates and steady increase in male – female ratio. *Journal of Affective Disorders*, 146(3), 361-368. doi: 10.1016/j.jad.2012.09.020
- Sun, L., Zhou, C., Xu, L., Li, S., Kong, F.,... Chu, J. (2017). Suicidal ideation, plans and attempts among medical college students in china: The effect of their parental characteristics. *Psychiatry Research*, 247, 139-143. doi: 10.1016/j.psychres.2016.11.024
- ten Have, M., de Graaf, R., van Dorsselaer, S., Verdurmen, J., van T Land, H., Vollebergh, W.,... Beekman, A. (2009). Incidence and course of suicidal ideation and suicide attempts in the general population. *Canadian Journal of Psychiatry*, 54(12), 824-833
- Townsend, K. C., & McWhirter, B. T. (2005). Connectedness: A review of the literature with implications for counseling, assessment, and research. *Journal of Counseling & Development*, 83(2), 191-201
- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A.,... Joiner, T. E. (2010). The interpersonal theory of suicide. *Psychological Review*, 117(2), 575-600. doi: 10.1037/a0018697
- Van Orden, K. A., Witte, T. K., Gordon, K. H., Bender, T. W., & Joiner Jr., T. E. (2008). Suicidal desire and the capability for suicide: Tests of the interpersonal-psychological theory of suicidal behavior among adults. *Journal of Consulting and Clinical Psychology*, 76(1), 72-83. doi: 10.1037/0022-006X.76.1.72
- Wang, C., Chan, C. L. W., & Yip, P. S. F. (2014). Suicide rates in China from 2002 to 2011: An update. *Social Psychiatry and Psychiatric Epidemiology*, 49(6), 929-941. doi: 10.1007/s00127-013-0789-5
- Weerasinghe, M., Pieris, R., Eddleston, M., van der Hoek, W., Dawson, A.,... Konradsen, F. (2008). Safe storage of pesticides in Sri Lanka - Identifying important design features influencing community acceptance and use of safe storage devices. *BMC public health*, 8, 276. doi: 10.1186/1471-2458-8-276
- WHO. (2014). *Preventing suicide: A global imperative*. Luxembourg: World Health Organization.
- WHO. (2016). *Practice manual for establishing and maintaining surveillance systems for suicide attempts and self-harm*. Geneva: World Health Organization.
- WHO. (2017). *Depression and other common mental disorders: Global health estimates*. Geneva: World Health Organization.
- Wu, C., Chen, Z., Yu, L., Duan, W., & Jiang, G. (2015). Effects of depression and hopelessness on suicide ideation: The mediation effect of psychache. *Chinese Journal of Clinical Psychology*, 23(6), 1040-1043
- Xie, Y., & Zhou, X. (2014). Income inequality in today's China. *Proceedings of the National Academy of Sciences*, 111(19), 6928-6933. doi: 10.1073/pnas.1403158111

- Yang, G., Phillips, M. R., Zhou, M., Wang, L., Zhang, Y.,... Xu, D. (2005). Understanding the unique characteristics of suicide in China: National psychological autopsy study. *Biomedical and Environmental Sciences*, 18(6), 379-389
- Yang, L., & Chen, W. (2017). Reliability and validity of the Psychache Scale in Chinese undergraduates. *Chinese Journal of Clinical Psychology*, 25(3), 475-478
- Yip, P. S. F., Liu, K. Y., Hu, J., & Song, X. M. (2005). Suicide rates in China during a decade of rapid social changes. *Social Psychiatry and Psychiatric Epidemiology*, 40(10), 792-798. doi: 10.1007/s00127-005-0952-8
- Yip, P. S. F., Yousuf, S., Chan, C. H., Yung, T., & Wu, K. C. C. (2015). The roles of culture and gender in the relationship between divorce and suicide risk: A meta-analysis. *Social Science & Medicine*, 128, 87-94. doi: 10.1016/j.socscimed.2014.12.034
- You, Z., Song, J., Wu, C., Qin, P., & Zhou, Z. (2014). Effects of life satisfaction and psychache on risk for suicidal behaviour: A cross-sectional study based on data from Chinese undergraduates. *BMJ Open*, 4(3), e4096. doi: 10.1136/bmjopen-2013-004096
- Zhang, J. (1996). Suicides in Beijing, China, 1992 - 1993. *Suicide and Life-Threatening Behavior*, 26(2), 175-180
- Zhang, J., Conwell, Y., Zhou, L., & Jiang, C. (2004). Culture, risk factors and suicide in rural China: A psychological autopsy case control study. *Acta Psychiatrica Scandinavica*, 110(6), 430-437. doi: 10.1111/j.1600-0447.2004.00388.x
- Zhang, J., Liu, Y., & Sun, L. (2017). Life satisfaction and degree of suicide intent: A test of the strain theory of suicide. *Comprehensive Psychiatry*, 74, 1-8. doi: 10.1016/j.comppsy.2016.12.002
- Zhang, X., Li, H., Zhu, Q., Zhou, J., Zhang, S., Zhang, L.,... Sun, C. (2008). Trends in suicide by poisoning in China 2000-2006: Age, gender, method, and geography. *Biomedical and Environmental Sciences*, 21(3), 253-256. doi: 10.1016/S0895-3988(08)60038-0

Table 1 Correlations, Means, and Standard Deviations for the Study Variables

	1	2	3	4	5	6	<i>M</i> ± <i>SD</i>
1 Psychache							18.67±5.86
2 Hopelessness	.48***						45.94±10.06
3 Belongingness	.47***	.56***					12.74±5.61
4 Burdensomeness	.45***	.53***	.56***				14.91±6.85
5 ACSS-FAD ^a	-.01	-.05	.01	.06*			13.39±4.94
6 SCS ^b	.12***	.02	.02	.10**	.46***		17.26±6.62
7 Suicide ideation	.33***	.30***	.29***	.30***	.24***	.23***	1.16±2.14

Note. N = 1097; a Acquired Capability for Suicide Scale- Fearlessness about Death; b Suicide Capacity Scale; * $p < .05$, ** $p < .01$,

*** $p < .001$.

Table2 Hierarchical Regression Predicting Suicide Ideation

Dependent variable: Suicide Ideation					
	Variable	Final β	95% CI	R ² change	<i>t</i>
Step 1	Psychological Pain	.12	.04, .19	.08	3.10**
Step 2	Hopelessness	.21	.15, .27	.03	6.50***
Step 3	Psychological Pain \times Hopelessness	.12	.05, .18	.01	3.53***

Note. N = 1097

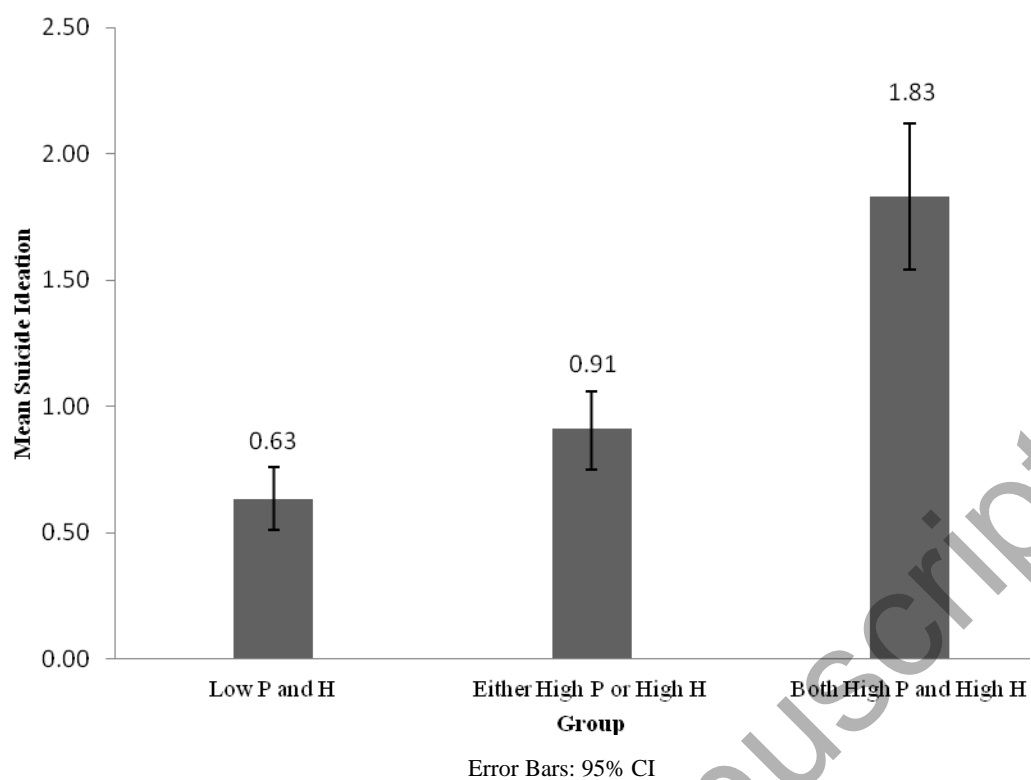


Figure 1 Interactive Effect of Psychological Pain (P) and Hopelessness (H) on Suicide Ideation

Table 3 Predictive Power of Suicide Capacity on risk of Lifetime Suicide Attempt

	Dependent variable: Lifetime Suicide Attempt				
	B	Wald	p Value	OR	95% CI
Suicide Ideation	.53	9.98	.002**	1.70	1.22 to 2.35
Practical contributors	.14	6.94	.008**	1.15	1.04 to 1.27

Note. N = 235



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