Sadder but wiser: Emotional reactions and wisdom in a simulated suicide intervention

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Scholars within the Berlin paradigm have analysed participants’ responses to a hypothetical vignette about a friend’s suicide ideation. However, no study has yet focused on participants’ emotional reactions to this scenario, an important aspect of wisdom performance. We conducted a Thin-Slice Wisdom study where participants were asked to give advice to a hypothetical friend contemplating suicide. We analysed their emotional profiles using facial expression analysis software (FACET2.1 and FACEREADER7.1). Participants’ verbal responses were also transcribed and then scored by 10 raters using the Berlin criteria. Results revealed that the sadder the participants felt, the wiser their performance. Wiser participants may have been better at exploring this sad, but true, existential human dilemma.

Keywords: Wisdom; Suicide prevention; Emotional profile; Berlin wisdom paradigm; Thin-slice wisdom paradigm.

“To be, or not to be, that is the question.”
—William Shakespeare, Hamlet, Act III, Scene I

It’s believed that fear of death is universal and that human beings instinctively seek to preserve value and meaning for our transient lives (Pyszczynski, Solomon, & Greenberg, 2015). Paradoxically, suicide—voluntarily and intentionally taking one’s own life—is the main cause of death among adolescents and emerging adults aged 15–24 years in many countries (Zalsman et al., 2016), and yet emerging adulthood is also a key period for developing wisdom (Staudinger & Pasupathi, 2003; see also Webster, Weststrate, Ferrari, Munroe, & Pierce 2018). Young adults at risk for committing suicide sometimes reveal their suicidal ideation to close friends, and a wise response from that friend could save their life.

In the Berlin Paradigm, wisdom is defined as “expert knowledge” about the fundamental pragmatics of life, which includes knowledge of existential life problems. The paradigm proposes five criteria for wisdom-related knowledge: Two criteria (rich factual knowledge and rich procedural knowledge) are considered basic to any expert knowledge system; however, three meta-components are considered unique to wisdom-related knowledge (lifespan contextualism, value-relativism/tolerance, and awareness and management of uncertainty) (Baltes & Smith, 2008). Participants’ wisdom-related judgement and insight are then rated on these five wisdom criteria to give an overall assessment of their wisdom when confronting a life problem. Famously, in one such “existential life management problem”, participants were asked to imagine the following scenario: “Somebody gets a phone call from a good friend who says that he/she can’t go on any more and that he/she has decided to commit suicide. What should one do and consider?” (Baltes, Staudinger, Maercker, & Smith, 1995, p. 159). Clearly, deliberating about what one should think and do when a friend wants...
to commit suicide is essential to managing one of the most central existential problems in human life, and so by this definition requires wisdom (Baltes et al., 1995).

Although emotion regulation and empathy are considered necessary manifestations of wisdom (Baltes & Smith, 2008), none of the Berlin Paradigm studies measure participants’ actual emotional reaction when giving advice about suicide intervention. However, emotional response is integral to wisdom performance (Ardelt & Ferrari, 2014), and could significantly affect the ability of others to actually prevent suicide. That said, it is not clear whether Stange and Kunzmann (2009) are correct that wiser individuals feel more emotion (e.g., be sadder) when advising a hypothetical friend contemplating suicide, due to their greater concern for others, or whether wiser performance will be less emotional as suggested by the Stoics and other ancient Socratic philosophers (Ardelt & Ferrari, 2014). An unpublished study by Grossmann (2018) found that self-reported emotionality was significantly positively correlated with wiser reasoning about participants’ own unresolved conflicts, which seems to support Stange and Kunzmann.

In this study, we assessed the relationship between Chinese adults’ wisdom performance and their emotional reaction, assessed in real-time with advanced software. We used a second-person perspective “Thin-Slice paradigm,” that a previous preliminary study has shown to be reliable and valid (Hu, Ferrari, Wang, & Woodruff, 2017). Additionally, we also explored the Chinese participants’ proposed reasons for continuing to live, which to our knowledge are not considered within the Berlin paradigm.

Hypothesis
Proportional time/rating of sadness in the simulated second-person perspective suicide prevention should be significantly positively correlated with the Berlin wisdom rating.

METHOD

All procedures used in the current study were approved by the University Ethics Committee. Electronically written consent was obtained from all participants. Moreover, we explained the nature of our study and ensured participants that their personal information would be kept confidential. Contact information for a professional psychological consultant was also provided, in case any participants needed such service as a result of participating in this study (to our knowledge, none did). Forty-two participants allowed for both qualitative and quantitative analyses in this study. Although the number of participants might seem relatively small, each generated an enormous amount of data: thousands of emotion measurements gathered 29 times per second using artificial intelligence, emotion rating by six human raters, and wisdom rating by 10 trained raters.

Participants
Forty-five Chinese undergraduates at Zhejiang Normal University volunteered to participate in this study after seeing a campus advertisement. However, three participants did not follow our instructions properly, so the final data set included 42 participants (23 females and 19 males) aged 18 to 22 (M = 19.36, SD = 1.06). All participants were healthy native Chinese speakers without any physical or mental illness and with normal or corrected-to-normal vision. Participants were each paid 20 RMB (about 3 US dollars) to participate in the study.

Material
A hypothetical life scenario, adapted from the original Berlin existential life management task, was printed on a sheet of A4 paper: “Imagine one of your friends suddenly told you that he wants to commit suicide because of bankruptcy, due to a debt that he cannot pay off for the rest of his life. He is serious about this intention. What would you say to him?”

A laptop with a camera was used to capture 29 frames per second of emotional reactions. We used iMotions—Attention Tool FACET module (version 2.1) and Noldus FACEREADER7.1 facial expression analysis software to analyse these data. A previous study of patients with suicidal intent had confirmed a link between the facial affect data generated by the FACET module to established peripheral arousal measures, including: event-related potentials (ERP), heart rate variability (HRV) and galvanic skin response (GSR) (Amico et al., 2016). FACEREADER7.1’s validity for measuring Asian participants’ emotional reaction was supported by Chentsova-Dutton and Tsai (2010)’s study, which found that the association between attention to relational aspects of the self and levels of emotional reactivity resembled, or was greater, for Asian Americans as compared to European Americans.

Procedure
The participants completed the vignette scenario assessment individually, in Chinese, in a quiet laboratory room. Before the formal test, to become accustomed to the unusual situation of talking to a camera, participants completed a practice task (i.e., talking about the transience of life/how time flies). They were then instructed to read the vignette printed on an A4 paper while sitting in an armchair, with the laptop camera set about 30 cm away.
from their faces. The participants were instructed to imagine the camera as the eyes of the hypothetical friend and talk to “him” or “her”. Their responses were recorded by the camera. Participants were told not to speak until they had reflected upon the problem thoroughly and felt ready to begin. In order to mimic a natural situation, no time limit was set for the participants’ responses. The experimenter, a graduate student at department of psychology, left the laboratory room, so as to allow participants to feel more comfortable and less constrained in completing the task.

Data analysis

Berlin wisdom ratings

The participants’ responses in the suicide scenario ranged from 63 to 836 Chinese characters ($M = 296.14$, $SD = 191.47$). (Note that 63 Chinese characters represent much more ideas than 63 English words do.) These transcribed responses were then coded by ten trained raters. Raters were strictly trained according to the Berlin wisdom Manual (Staudinger, Baltes, & Smith, 1994). Raters were specifically trained according to the manual (including scale anchoring, rating each transcript independently rather than ranking them, etc.). All raters practiced by rating recorded advice on “Midlife crisis” or on “whether an undergraduate should discontinue schooling,” given by the first author of this article before the actual experiment. Each rater was compensated 250 RMB (about $40 US). To prevent mutual influence from the ratings on different criteria (“halo effect”), each rater rated the transcribed responses on only one criterion; In order to calculate inter-rater reliability, two raters rated on one criterion in randomly presented transcripts.

Analysis of reasons for living

Thematic analysis, based on constructivist grounded theory, was used to identify common reasons for living given in the participants’ responses. Thematic analysis proceeded as follows: 10 coders first identified themes separately. Afterwards, a codebook was developed by the first author based on common themes identified. Finally, two trained graduate students in psychology coded the transcripts again according to this codebook (See Appendix). Coder agreement and Kappa values for each category of this codebook were analysed following the procedure in Glück, Bluck, Baron, and Mcadams (2005)’s study. The coder agreement and Kappa value were acceptable for all the codes, all coder agreements were greater than 80.0% and all Kappa values were greater than 0.65. The number of participants who mention each reason for living was calculated based on coder consensus, after discussion to resolve any initial disagreements.

Evaluation of suicide prevention rhetorical force

In order to evaluate the rhetorical force of participants’ speeches to prevent potential suicide (i.e., likely effectiveness in reducing likelihood of suicide), their responses were evaluated by four adults who had attempted suicide. Participants’ video responses were converted to audio files to prevent potential influence of attractiveness or facial expression on the evaluation. The evaluators were asked: “If you were that friend, how likely would you be to commit suicide after listening to this response?” And then they indicated on a 10-point scale the likelihood of attempting suicide after listening to each participant’s response. Rhetorical force was calculated as 10 minus the likelihood of suicide for each response.

These adults also noted words that impressed them in each response and their general feelings after listening to each audio response. The evaluation protocol and materials were sent to these adults over the internet, and they completed the evaluation on their own computers at home.

Facial expression analysis of emotion by FACET2.1 and FACEREADER7.1

We used two common facial-expression-analysis software: FACET2.1 and FACEREADER7.1.

FACET calculates the probable occurrence of seven basic emotions (joy, sadness, anger, contempt, fear, surprise, disgust) and three general valences (negative, positive, neutral). The system first identifies and locates the face in each frame of the video; and then automatically measures basic facial Action Units (AU) in a well-established Facial Action Coding System (FACS)—a comprehensive, compositional, and anatomically-based facial muscular movement analysis system (Ekman & Rosenberg, 1997). AUs make up Facial expressions, just as letters make up words. Fear, for example, combines “Brow Raiser Frontalis” (AU1), “Outer Brow Raiser Frontalis” (AU2), “Brow Lower Depressor Glabellae” (AU4), and “Upper Lid Raiser Levator Palpebrae Superiors” (AU5).

The Attention Tool FACET module provided evidence for each emotion category on each frame of each video. The positive evidence for a category of emotion per video frame was used to estimate the aggregate time of that emotion. The proportional time of each emotion was obtained by dividing the number of positive evidence frames by the total number of frames within a video, excluding ambiguous frames.

FACEREADER uses a similar method of identifying emotions to that of FACET (positive evidence of an emotion was defined as a probability higher than 0.5); however, besides assessing the above-mentioned seven basic emotions and three valences, FACEREADER also provides numeric values for arousal. Moreover, an Asian
face model was embedded in FACEREADER7.1, which was used as the training model for this study.

**Emotion rating by raters**

Rather than rely solely on facial expression, we also used a more holistic measurement of emotion. After watching each videotaped performance, 6 raters from Department of Psychology (three undergraduate and three graduate students) independently rated each participant’s response for these seven basic emotions using a four point scale (0: not present - 3: very obviously present). (Each rater rated all seven basic emotions.)

**RESULTS**

**Berlin wisdom rating**

Inter-rater reliability was acceptable for all the Berlin criteria, all Cronbach’s alpha were 0.70 or greater. Therefore, we calculated averaged ratings on each Berlin criterion. Inter-item reliability was also acceptable (Cronbach’s alpha = .92). Therefore, a Berlin wisdom rating was calculated by averaging the ratings of all coders (see Table 1).

Response length was significantly positively correlated with the Berlin wisdom rating, \( r = .93, p < .001 \).

**Reasons for living**

We also counted the number of the participants who mentioned each reason for living (For the details, see Appendix). Almost all the participants (40/42, 95.2%) viewed interpersonal connection (i.e., concern for others or others’ concern for you) as the reason for living. This reason for living concerns one’s connection with others and their welfare, or others’ financial and emotional support. For example, “Consider your family: how would they live?”, “Your families and friends would be sad.”, “Consider the loaners, they would get no money back.”; or, “We will help you.”, “You still have us who concern you.”

**Emotional profiles during suicide prevention**

**Facial expression analysis by FACET and FACEREADER software**

Proportional time of each emotion expressed during participants’ responses to the hypothetical suicidal friend is shown in Table 2. The results of these two different facial expression analysis software were partially consistent with each other.

More specifically, Spearman correlation analyses revealed that the proportional time of emotion calculated based on data of FACET2.1 and FACEREADER7.1 were significantly positively correlated on three basic emotions: joy, \( \rho = .60 \), anger, \( \rho = .53 \); and surprise, \( \rho = .39 \). However, other correlations were not significant (all \( \rho < .28 \), all \( p < .05 \)).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
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<th>Maximum</th>
<th>M</th>
<th>SD</th>
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<tr>
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<td>0.89</td>
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<tr>
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<td>Overall Berlin wisdom</td>
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<td>1.20</td>
<td>4.50</td>
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<td>0.81</td>
</tr>
</tbody>
</table>

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Correlation of emotional profiles with the Berlin wisdom rating

Spearman correlation analyses were conducted between proportional time of basic emotion and the Berlin wisdom rating. Based on the results of FACET, the Berlin wisdom rating was marginally negatively correlated with the proportional time of contempt, $\rho = -0.29$, $p = 0.086$, $N = 36$. Based on the results of FACEREADER, the Berlin wisdom rating was significantly positively correlated with the proportional time of sadness, $\rho = 0.41$, $p = 0.007$, $N = 42$; and significantly positively correlated with the Proportional time of disgust, $\rho = 0.36$, $p = 0.02$, $N = 42$. However, it was significantly negatively correlated with arousal, $\rho = -0.43$, $p = 0.005$, $N = 42$. Pearson correlation analyses revealed that the average rating of sadness by human raters was significantly positively correlated with the Berlin wisdom rating, $r = 0.36$, $p = 0.021$, $N = 42$ (For the scatterplot, see the right pane in Figure 1).

DISCUSSION

Berlin wisdom rating and emotional profile

According to the Berlin Wisdom Paradigm standard measurement procedure, only participants who score high on all criteria are considered wise. None of our participants met this criterion: in fact, highest score on some criteria was only 4 (see Table 1). Actually, the Berlin wisdom rating for these participants’ performance in suicide scenario was significantly lower than the previous performance of another group of participants who advised a friend about an unrealistic singing career scenario (see: Hu, Ferrari, Wang, & Woodruff, 2017), $t(70) = -2.56$, $p = 0.013$. Further analyses revealed that participants’ rating on the meta-criterion “value relativism” for the suicide scenario was significantly lower than in the singing scenario about life-planning, $t(70) = -8.59$, $p < 0.001$. However, there was no significant difference in the ratings on the other two meta-criteria (i.e., “lifespan contextualism” and “recognition and management of uncertainty”, both $p > 0.05$).

Terror Management Theory may apply to advice given in such suicide prevention scenarios. Neuroscientific studies reveal that simply processing linguistic cues of death can decrease activity in bilateral insula that mediates neural representation of the sentient self (Han, Qin, & Ma, 2010; Shi & Han, 2013). Therefore, as suggested by studies on Mortality Salience effect (Goldenberg & Arndt, 2008; Pyszczynski et al., 2015), participants may have tried to maintain their own values when reminded of their mortality in this suicide-related scenario, and thus scored lower on “Value-relativism”. Alternatively, observed differences might be due to the unique nature of suicide-related problems in Chinese collectivist culture. Chinese participants might regard someone planning to commit suicide as disgraceful, losing face and as betraying her/his social group. Or, people without professional training in suicide prevention may simply be insensitive to their friends’ needs and values when hearing about their suicide ideation.
According to the results of FACEREADER, individuals who were deemed wiser in suicide prevention were also sadder and calmer (i.e., showing lower arousal). However, native Chinese coders’ emotion ratings might be as good or even more reliable than those generated through artificial intelligence of FACET and FACEREADER, because understanding others’ emotion is key to social adaptation, and adults have been trained since early childhood to recognise others’ emotion by simultaneously listening to their speech, observing their body language and facial expression—a training that may be culturally specific, even while allowing for the universality of basic emotions. Indeed, human ratings also found that sadder individuals performed wiser in suicide prevention, replicating the result of software FACEREADER. That said, some basic emotions (e.g., surprise, contempt) in this suicide prevention scenario may be particularly difficult for human coders to identify, leading to unacceptably low levels of inter-rater reliability on ratings of these emotions.

Relation between sadness and wisdom in suicide prevention

In general, wisdom researchers, such as Baltes and Staudinger (2000), acknowledge the costs of wisdom—sacrifice of subjective well-being, pursuing meaning and connection rather than well-being and satisfaction. Thus, wiser individuals are not necessarily happier moment to moment (Ferrari & Weststrate, 2013). Weststrate and Glück (2017) argue that individuals with higher wisdom in life are not necessarily sadder over time, although their well-being might suffer as they deal with difficult life challenges.

Our results suggested that individuals who feel greater sadness may be wiser at preventing their friend’s suicide. Consistently, adults who had attempted suicide commented that concern for a friend planning suicide is critical to suicide prevention. Experienced sadness is arguably due to empathy and compassion for the hypothetical friend, and such affective connection to others’ life dilemmas is considered essential to wisdom performance (Ardelt & Ferrari, 2014).

Inspired by the seminal work of Alloy and Abramson (1979), many researchers have examined the “sadder but wiser” hypothesis in many different fields, including decision-making in Behavioural Economics (Baillon, Koellinger, & Treffers, 2016). However, very few empirical studies have investigated this issue in the field of wisdom. Kunzmann and Baltes (2003) measured participants’ self-report of affective feelings and found negative correlations of wisdom to negative and pleasant feelings in the previous year; nevertheless, they proposed the need to study the relationship between wisdom and actual emotional reactions to specific emotion-arousing events.

To our knowledge, this is the first empirical study of the relationship between wisdom and actual emotional reactions to suicide-related events. In fact, emotion is always integral to cognition, for example, positive emotions generate more relaxed and holistic cognition, while negative emotions generate more elaborate and detailed cognition (Hills, Werno, & Lewis, 2011). If so, sadness may benefit wisdom in one context, yet be detrimental to wisdom in other contexts. Effect of contexts on wisdom is probably modulated by individuals’ emotional reactions within those specific contexts, consistent with Grossmann’s (2018) recent finding that wise reasoning benefits from rich emotion.

Reasons for living

Compared with the Western model underlying Reasons for Living Inventory (Linehan, Goodstein, Nielsen, &
Chiles, 1983; Osman et al., 1998), our participants’ reasons for living echoed Western “responsibility to family/family alliance and peer acceptance and support” (concern for others; others’ concern for you) and “survival and coping beliefs/future optimism and self-acceptance” (solvable problem; life is good/cherish life; suicide intention is transient); yet unrelated to the other reasons mentioned in the Western model, perhaps because none of our participants had children (and thus no child-related concerns), suicide action (and thus no fear of suicide/suicide-related concerns), strong religious belief, or moral rule against suicide (and thus no fear of social disapproval and moral objections).

Overall, our participants’ wisdom (i.e., their expert knowledge in the fundamental pragmatics of life, as expressed in this simulated attempt at suicide prevention) is probably shaped by their experience of living in a collective culture that emphasises interpersonal connection over personal value and self-esteem. In fact, previous studies revealed that suicide rate among Chinese Americans over the age of 65 was higher than for other racial groups, and lack of interpersonal connection may be an important causal factor (Dong, Chang, Zeng, & Simon, 2015).

Practical and theoretical implications

Our results suggested that expression of wisdom benefited from rich emotional feelings, refuting a simple reading of the philosophy of Stoics and other ancient Socratic philosophers. Still, individuals do not necessarily feel sadness about hypothetical suicides, which may reflect their authentic attitude toward actual potential suicides. This finding has significant implications for professional suicide prevention; for example, it might be useful to assess the facial expression of therapists during hypothetical suicide prevention, to educate them about the important role of emotional rapport with those in distress. This could be an important part of the recruitment and training of professional experts on suicide prevention.

Limitation

Despite the strengths of our study, it has at least six limitations. (a) This is only a correlational and any cause–effect relationship should be inferred with caution. (b) Facial expression analysis technology, like any computer technology, is still under development. (c) Our Thin-Slice Wisdom Measurement remains somewhat artificial: participants were talking to a camera, which was unnatural for them—future studies should be conducted in a real suicide prevention scenario, which is much more difficult to achieve, but ultimately necessary. (d) Although our sample size is adequate for facial analyses, the sample is small for statistical analyses, limiting the generalizability of our results. Given a larger sample, the statistic power would be higher and researchers would be more likely to detect significant correlations: the Berlin Wisdom rating might be significantly correlated with several other basic emotions besides sadness. (e) A previous study by Staudinger and Baltes (1996) has shown that thinking time strongly influences response quality; therefore, future studies should record the precise amount of time participants devoted to thinking and assure that participants have sufficiently reflected upon the problem. (f) Finally, future studies using the same procedure should be conducted in other cultures to investigate cultural differences in the relationship between emotional reaction and wisdom in suicide prevention.

CONCLUSION

In spite of its limitations, this is the first study to investigate actual emotional reaction and its relationship to wisdom (i.e., meta-level thinking) during suicide prevention. It uses a novel paradigm with important implications for professional training in suicide prevention. According to our findings, wiser performance is more emotional, challenging a simple reading of Stoicism. Instead, wisdom may resemble an Aristotelian master virtue (Schwartz & Sharpe, 2006) essential to solving problems of specificity, relevance, and conflict of competing concerns by deploying the right emotions in the right degree to bear on the situation being experienced, for example, discussion of perhaps the most fundamental human existential dilemma: whether to commit suicide.

Manuscript received October 2017
Revised manuscript accepted August 2018

REFERENCES


Ferrari, M., & Weststrate, N. M. (2013). The scientific study of personal wisdom. In M. Ferrari & N. M. Weststrate (Eds.), The scientific study of personal wisdom (pp. 325–341). Amsterdam, NL: Springer Netherlands.


APPENDIX

A. CODEBOOK OF REASONS FOR STAYING

1. Concern for Others: considering the potential harm of your suicide on others, for example, families, friends, or even the debtors (N = 33).

2. Others’ concern for you: families and friends’ affection for you (including the advisor as a friend) (N = 24).

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3 Solvable Problem: The debt might be paid off in the future (life events are uncertain) \( (N = 32) \).
4 Life is good/cherish life: positive value of living, without further explanation \( (N = 14) \).
5 Suicide intention is Transient: your ideas may change given time \( (N = 5) \).

(Note: \( N \) = number of the participants coded.)