

Detecting Suicidality From Facial Appearance

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Abstract

Suicide is a pervasive problem worldwide. In this investigation, we show that individuals can perceive suicidality from facial appearance with accuracy that is significantly greater than chance guessing. Inferences of expected or obvious cues, such as how depressed a person seems, did not lead to accurate judgments. Rather, perceptions of how impulsive an individual appears differentiated suicide victims from living controls. Teasing apart various forms of impulsivity revealed that perceptions of impulsive aggression, distinct from other forms of impulsive behavior (e.g., impulsive buying), distinguished suicide victims from controls. Finally, experienced mental health clinicians did not perform significantly better than laypersons at judging suicidality. Facial appearance may therefore hold cues to suicidality, expanding what is known about the expression and perception of social cues from the face and providing new insights into the relationship between mental health and nonverbal cues.

Keywords

suicide, appearance, impulsivity, nonverbal behavior, person perception

A growing literature in social and personality psychology has shown that people are able to accurately perceive information about others from very limited nonverbal information, such as facial appearance, across a number of domains (Zebrowitz, 1997). Subtle distinctions between groups of individuals, such as their sexual orientations (Rule & Ambady, 2008), political affiliations (Rule & Ambady, 2010; Samochowiec, Wanke, & Fiedler, 2010), and religious beliefs (Rule, Garrett, & Ambady, 2010) can be judged from their faces with accuracy that is significantly greater than chance guessing. Moreover, previous work has shown that aspects of an individual's face can in some cases predict future life events, such as litigation outcomes (Zebrowitz & McDonald, 1991), career success (Collins & Zebrowitz, 1995), and whether he or she will one day be divorced (Hertenstein, Hansel, Butts, & Hile, 2009). In the latter two cases, specific affective features (i.e., smile intensity) were found to be important. Additionally, studies have shown that longevity can be predicted from facial attractiveness (Henderson & Anglin, 2003) and smiling behavior (Abel & Kruger, 2010).

Despite perceivers' capacity to predict longevity from facial cues, instances examining this have typically assessed cases of timely deaths. Little is known about whether facial cues might reveal untimely or premature deaths and what that might suggest about the human ability to extract signals from subtle appearance cues. Although various causes of premature death could be difficult to ascertain from a target's appearance (e.g., being accident-prone), one cause of premature death that may be closely linked with a target's experiences is his or her potential to commit suicide. Indeed, given that depression, life satisfaction,

and hopelessness have all been linked to suicidality, it may be logical to presume that nonverbal cues, such as emotional facial expressions, might also signal an individual's susceptibility to suicide; for example, visible cues to depressed affect (see Heller, Haynal-Reymond, Haynal, & Archinard, 1997).

The extant literature examining predictors of suicide attempts or completion have illuminated several critical factors, including behaviors (e.g., self-harm), traits (e.g., impulsivity), and affective variables, such as feelings of hopelessness and depression, that may predict whether an individual is at risk for suicide (Brown, Beck, Steer, & Grisham, 2000; Javdani, Sadeh, & Verona, 2011; Ougrin et al., 2011; Sokero et al., 2005). Although perhaps counterintuitive, affect-related factors are not necessarily primary predictors of whether someone commits suicide (Nock, Hwang, Sampson, & Kessler, 2010). Rather, impulsivity, and not necessarily depression, has been shown to predict suicidal behavior in some instances (Apter et al., 1995; Javdani et al., 2011). Aspects of facial appearance beyond affect may therefore hold clues to an individual's risk of suicide. Considering what is known about the capacity of the static face to communicate information beyond obvious cues that are consciously recognized (Rule, Ambady, Adams, & Macrae,

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2008; Zebrowitz, 1997), we predicted that facial appearance might provide insights to suicidality. Elucidating whether facial cues of suicidality exist would be informative for increasing basic understanding of social face perception as well as the relationships between mental health, personality traits, and nonverbal cues.

Study I

In Study 1A, we sought to test whether it is possible for people to judge suicidality from photos of faces. To achieve this, we asked participants to categorize suicide victims and matched living controls as having committed suicide or not based on their school yearbook photos. Study 1B repeated this task but presented participants with just the internal features of the faces to remove any cues from background, hairstyle, or face shape. Finally, Study 1C repeated Study 1B with a second set of faces.

Study 1A

Method

Stimuli

The facial stimuli used throughout this work consisted of yearbook photos of individuals from various high schools and universities across North America. Using alumni records and obituaries, the authors first culled faces of individuals with whom they attended school that had committed suicide and for whom the authors had access to yearbook photos. Once these sources were exhausted, the authors solicited yearbooks from acquaintances who engaged in similar procedures for identifying former classmates who had committed suicide. In cases where obituaries could not be located for suspected suicide victims, individuals were queried as to their confidence that the individuals they knew had died as a result of suicide along a 7-point scale ranging from 1 (*Not confident that the person committed suicide*) to 7 (*Completely confident that the person committed suicide*); we felt that this was important, given that many suspected suicides appear as accidents (Litman, Curphey, Shneidman, Farberow, & Tabachnick, 1963). All individuals indicated a rating of 7, demonstrating total confidence that the cause of death was suicide for all targets.

In total, we obtained 40 photos (12 women; 28 men) of individuals who committed suicide within the last 15 years. Each individual who committed suicide was then matched with the nearest photo in the yearbook of a living individual of the same sex and race (87.5% Caucasian, 7.5% East Asian, 2.5% South Asian, 2.5% Latino); hence, there were 80 photos in total (24 women, 56 men). Control targets were researched through Internet searches and social networking sites (e.g., Facebook.com) to assure that they were still alive and had not themselves committed suicide. Each photograph was standardized by cropping the image to the extremes of the face and head and converted to grayscale (Figure 1A). In the interest of confidentiality, no information pertaining to any of the individuals in the

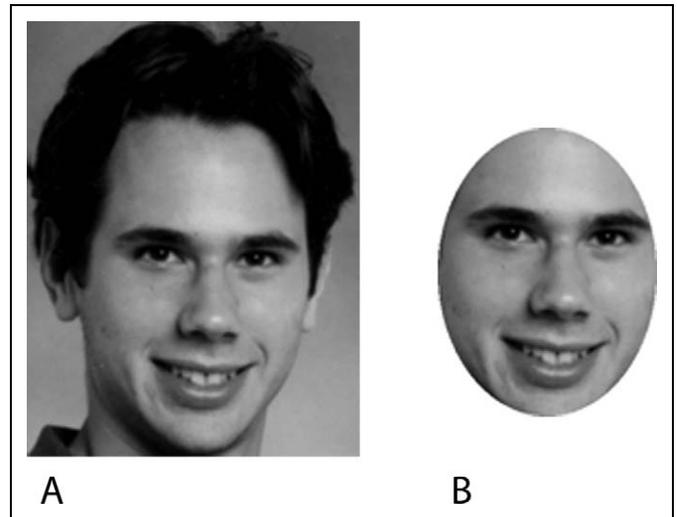


Figure 1. An example stimulus representing both types used in the experiments: (A) full face, (B) cropped face showing only the internal facial features.

photos was disclosed (e.g., whether the stimulus target had committed suicide) and participants were asked to report any recognitions of targets; there were none.

All photos were pretested for variables known to exert strong effects on judgments from faces: attractiveness (Dion, Berscheid, & Walster, 1972) and emotional expression (Zebrowitz, Kikuchi, & Fellous, 2010). Separate groups of undergraduates rated the faces on either facial attractiveness ($N = 34$, Cronbach's $\alpha = .94$) or emotional expression ($N = 31$, Cronbach's $\alpha = .99$) along 7-point scales in exchange for partial course credit from 1 (*Not at all attractive*) to 7 (*Very attractive*) and 1 (*Neutral*) to 7 (*Very happy*), respectively. Paired t -tests showed that the suicide victims did not significantly differ from the matched controls on either variable: $t_s < 0.88$, $p_s > .38$, $r_s < .10$.¹

Procedure

In exchange for partial course credit, 33 undergraduates (55% female) viewed images of the targets in random order and were instructed at the beginning of the experiment to indicate whether they thought each target had committed suicide or was still alive. During each trial, key-response mappings appeared below each target in the bottom corners of the screen (i.e., “Z” paired with “Suicide” and “/” paired with “Not Suicide”). Although the judgments were not timed, participants were instructed to respond quickly and to use their gut instinct. Despite explicit instruction that some of the individuals they would see had committed suicide, one participant made uniform “Not Suicide” judgments for all 80 photos and was thus excluded from analysis.

Results

Data were analyzed using signal detection theory, which allows an assessment of accuracy/sensitivity that is independent of

underlying base rates and response bias (the tendency to make one categorization more frequently than the other; Macmillan & Creelman, 2005; Sporer, 2001). Correct categorizations of suicide victims as having committed suicide were counted as hits ($M = .29$, $SD = .18$) and incorrect categorizations of living individuals as having committed suicide were counted as false alarms ($M = .26$, $SD = .14$). Sensitivity and response bias for discriminating between the stimuli were then calculated using the nonparametric A' and B'' (Macmillan & Creelman, 2005) statistics, respectively.

A one-sample t -test showed that participants' accuracy in discerning whether each target had committed suicide was significantly better than chance guessing (.5): $M_{A'} = .54$, $SD = .08$; $t(31) = 2.75$, $p = .01$, $r = .44$. Consistent with population base rates for suicide, measures of response bias showed that participants tended to more often classify targets as still alive than as having committed suicide: $M_{B''} = .10$, $SD = .14$. Neither accuracy nor response bias significantly differed according to target or participant gender: $t_s < 0.97$, $p_s > .34$, $r_s < .17$.²

Study 1B

The results of Study 1A suggest that characteristics signaling suicidality could be discerned from targets' faces. To eliminate the possibility that photo backgrounds, hairstyles, or face shape were responsible for this effect, Study 1B examined whether participants ($N = 30$, 47% female) could still make these judgments accurately when the faces were cropped to exclude these elements. The 80 photos used in Study 1A were therefore cropped so that hair, face shape, and photo background were excluded (Figure 1B). Procedures were similar to Study 1A.

As above, participants' accuracy in categorizing suicide victims and living controls was significantly greater than chance, $M_{\text{Hits}} = .28$, $SD = .14$; $M_{\text{False alarms}} = .24$, $SD = .14$; $M_{A'} = .55$, $SD = .10$; $t(29) = 3.01$, $p = .005$, $r = .49$, and showed a bias toward categorizing targets as alive more often than dead ($M_{B''} = .11$, $SD = .14$). Thus, even when target faces were cropped to exclude all but the internal features of the face, participants were still able to judge whether the individuals had committed suicide significantly better than chance guessing.

Study 1C

Although the previous literature in social perception might predict that cues to suicidality could be expressed in facial appearance, the observation that information as minimal as a face's internal features might signal whether a person commits suicide may seem surprising. We therefore sought to replicate the findings. Because our previous strategy (i.e., asking acquaintances who knew people that committed suicide) was exhausted in terms of its capacity to provide new stimuli, alternative methods were explored. Online searches uncovered a website (www.facesofsuicide.com) containing photographs and names of suicide victims.

Two research assistants, both blind to the nature of the study, were recruited to gather stimuli. The first research assistant was instructed to retrieve the first 25 targets from the website that were between 14 and 19 years old ($M_{\text{Age}} = 16.48$, $SD = 2.02$) and posing face-forward to the camera. It is worth noting that the photographs changed in display order with each visit to the website; thus, selection of photos by order did not privilege any particular subset of targets. For each target chosen, an Internet search was performed for media reports confirming that each person died by suicide.

Next, the second research assistant received the set of 25 targets, unaware that any of the individuals had committed suicide; communication between the research assistants was prohibited and they were scheduled to work in the lab on separate days to avoid any incidental exchange of information. The second research assistant was asked to match the faces with photos of individuals of the same sex and race as those provided to her by culling photos from high school yearbooks borrowed from additional, experiment-blind research assistants. In addition, the research assistant matched the targets for eyeglasses (8% of photos) and approximate age based on the class of the students in the yearbooks. Internet searches and social networking sites were used to confirm that each of the control targets was currently living.

Once all 50 faces (40% female; 92% Caucasian, 4% East Asian, 4% Black) were gathered, they were standardized as in Study 1B (Figure 1B). Once again, two separate groups of participants rated the faces for emotional expression ($N = 31$, 57% female; Cronbach's $\alpha = .99$) and attractiveness ($N = 31$, 58% female; Cronbach's $\alpha = .88$). Results revealed no significant differences between the suicide victims and controls: $t_s < 1.21$, $p_s > .24$, $r = .24$.

A separate group of 29 (69% female) participants were then asked to judge whether they thought each target had committed suicide or was still alive. Similarly, their accuracy in discerning whether each target had committed suicide was significantly better than chance guessing (.5): $M_{A'} = .56$, $SD = .14$; $t(28) = 2.47$, $p = .02$, $r = .41$. Measures of response bias again showed that participants tended to classify targets as still alive: $M_{B''} = .22$, $SD = .33$.

Study 2

The results of Study 1 suggest that inherent in the faces of some individuals is information that allows people to distinguish living controls from suicide victims. To elucidate how suicidality might be expressed from one's face, in Study 2 we examined relevant behavioral traits that might distinguish the two groups. Although pretesting had shown no differences in superficial affect (i.e., smiling) related to whether individuals had committed suicide, other affect-related factors such as depression (Sokero et al., 2005), hopelessness (Brown et al., 2000), and low life satisfaction (Koivumaa-Honkanen et al., 2001) have been associated with suicidal thoughts and behaviors. In addition, the trait of impulsivity has been found to be an important predictor of suicide (Apter et al., 1995; Caspi, Moffitt, Newman, & Silva,

1996; Javdani et al., 2011). Thus, it is possible that perceivers are able to infer these characteristics from individuals' faces, leading them to make correct judgments about their suicidality.

Method

To investigate the affective- and trait-related variables that might lead to accurate judgments of suicide from faces, we asked a total of 161 undergraduates to rate each of the photos from Study 1A for either how depressed ($n = 30$; 6 males, 24 females), hopeless ($n = 49$; 12 males, 37 females), satisfied with life ($n = 46$; 29 males, 17 females), or impulsive ($n = 35$; 8 males, 27 females) the targets seemed. All four variables were rated along 7-point scales anchored at 1 (*Not at all X*) and 7 (*Very X*; all Cronbach's α s > .80) in exchange for either partial course credit or money.

Results

To determine whether there were significant differences between individuals that are still alive and those that have committed suicide on any of the four dimensions listed above, the average rating of each face across all participants was calculated and two-tailed paired t -tests were conducted comparing each target to his or her matched control. Suicide victims were perceived as significantly more impulsive ($M = 3.72$, $SE = .10$) than living controls, $M = 3.51$, $SE = .09$; $t(39) = 2.07$, $p < .05$, $r = .31$. The two groups did not differ in perceptions of life satisfaction, $t(39) = 0.71$, $p = .48$, $r = .11$, hopelessness, $t(39) = 1.25$, $p = .22$, $r = .20$, or depression, $t(39) = 1.11$, $p = .28$, $r = .17$, however.

In addition to examining differences between suicide victims and controls along these four traits, we considered how the traits related to *perceptions* of suicidality as a continuous variable. To measure this, we calculated the percentage of participants in Study 1 that categorized each face as having committed suicide. Both perceived depression, $B = .21$, $SE = .02$, $t(77) = 13.79$, $p < .001$, and impulsivity, $B = .04$, $SE = .02$, $t(77) = 2.08$, $p = .04$, significantly predicted these consensus judgments in a simultaneous regression analysis. In a second model, we added the interaction term for the two variables but it was not significant: $B = .02$, $SE = .06$, $t(76) = 0.93$, $p = .35$. Thus, although perceived depression did not differentiate the two groups in terms of their actual outcomes, it was significantly related to the participants' impressions of who had committed suicide. Thus, inferences of depression and impulsivity contribute to individuals' *perceptions* of suicidality. Distinct from depression, only inferences of impulsivity *actually predict* whether an individual commits suicide. Moreover, the contribution of impulsivity to perceptions of suicidality is independent of perceived depression, showing a significant effect even when depression ratings are statistically controlled.

Discussion

These findings comport well with previous research showing that trait impulsivity, but not necessarily depressive symptoms,

relate to suicidal behavior (e.g., Apter et al., 1995; Javdani et al., 2011). Although both impulsivity and depression distinguish suicide attempters from nonsuicidal individuals (Kashden, Fremouw, Callahan, & Franzen, 1993), Apter et al. (1995) highlight two types of suicidal adolescents: those who have "a planned desire to die" (p. 917) and those who do not want to live at a particular moment. Whereas the former tend to be characterized by depression, the latter are better characterized by impulsivity. Thus, although the severity of hopelessness (Brown et al., 2000), dissatisfaction with life (Koivumaa-Honkanen et al., 2001), and depression (Sokero et al., 2005) have been shown to significantly predict suicidal behavior, participants in this study did not discern any differences between suicide victims and living controls on these three dimensions. This could be because the targets employed were more akin to Apter et al.'s (1995) impulsive types, because hopelessness, dissatisfaction with life, and depression may not be clearly conveyed through static facial expressions (Brunswick, 1956; Funder, 1995), or perhaps because these affective qualities are only legible from appearance as individuals become temporally closer to committing suicide. Indeed, because the individuals who committed suicide had done so at varying lengths of time from when the photos were taken, these factors may not have been present in their photos, whereas a more stable trait like impulsivity might have been.

Study 3

Naturally, not all impulsive people commit suicide. Thus, we sought to better understand how nuances related to impulsivity might be involved in distinguishing perceptions of individuals who have committed suicide. Past research has found distinctions in impulsivity in terms of consumer behavior, risky sexual acts, and violent urges (Baumeister, 2002; Simon et al., 2001). We therefore asked participants to rate each face as to how likely they thought the person pictured might be to make an impulsive purchase, to engage in an impulsive sexual behavior (unprotected sex), or to be involved in an impulsive violent act (a bar fight).

Method

To probe the finding that impulsivity is associated with suicide outcomes, we recruited 133 participants in exchange for monetary payment to imagine each target used in Study 1A to be involved in one of three hypothetical scenarios: involved in a violent altercation at a bar ($n = 40$, 65% female), engaging in unprotected sex ($n = 53$, 57% female), or making an impulsive purchase ($n = 40$, 55% female). The experiment began with participants reading a description of the scenario corresponding to the condition to which they were randomly assigned, imagining that each of the forthcoming targets was the protagonist in such an event. Participants then rated each face for how likely the person was to be involved in such a scenario from 1 (*Not at all likely to engage in X*) to 7 (*Very likely to engage in X*; all Cronbach's α s > .87).

Results and Discussion

As above, the participants' ratings for each face were averaged and the two groups of targets were compared via two-tailed paired *t*-tests. Suicide victims were perceived as significantly more likely to engage in a violent altercation in the heat of the moment ($M = 2.93$, $SD = .16$) than were living controls, $M = 2.72$, $SD = .13$; $t(39) = 2.07$, $p < .05$, $r = .31$. However, the two groups were not perceived by participants to differ in their likelihood of engaging in unprotected sex, $t(39) = 1.25$, $p = .22$, $r = .20$, or in making an impulsive purchase, $t(39) = .27$, $p = .79$, $r = .04$. Given that suicide involves an impulsive violent action against the self (Hillbrand, 1995), it is fitting that individuals who have committed suicide were perceived as more likely to engage in an impetuous violent act. Thus, consistent with previous research (Simon et al., 2001), general perceptions of impulsivity (e.g., engaging in impulsive sex or making an impulse buy) did not distinguish suicide victims. Rather, it appears to be a specific tendency to respond with impulsive violence that cues perceivers to whether one has committed suicide.

Study 4

Study 1 showed that naïve, undergraduate perceivers can reliably identify whether an individual will commit suicide from a photograph. Although their accuracy in making these judgments was significantly and consistently greater than chance guessing, the size of the effect observed was not large (approximately 55%). We questioned, then, whether individuals with expert knowledge in assessing emotional distress and psychopathology might perform at levels better than undergraduates. Previous research has shown that individuals with expert knowledge are in some cases more accurate at judging nonverbal cues (O'Sullivan, 2008), whereas other studies have shown effects suggesting that increased knowledge can sometimes impair the ability to make accurate judgments (Hall, Ariss, & Todorov, 2007). In Study 4, we therefore asked professional psychotherapists working in the mental health field to perform the same judgments as in Study 1B and compared them to a community sample of nonclinicians.

Method

Psychotherapists ($N = 36$, 83% female) were recruited using snowball sampling to perform the categorization task using the Qualtrics online survey platform. Control participants ($N = 39$, 56% female) were recruited from the Mechanical Turk online community to complete the same task. Both groups made their judgments based on the internal features of the targets' faces, as in Studies 1B–1C, in exchange for monetary compensation. The psychotherapists reported an average of 11.07 ($SD = 9.66$, Range 1–33) years of experience treating patients. Type of education varied among the therapists (e.g., PhD in clinical psychology, MA in counseling psychology, etc.) and the control participants were queried about their education and profession; none were

trained or practicing as mental health clinicians or physicians. Instructions and procedures were otherwise the same as in the above studies. One control participant's accuracy level was more than three standard deviations below the mean of the group and was therefore excluded from analysis.

Results and Discussion

Data were analyzed using signal detection. Replicating Study 1B, the control participants categorized the targets with accuracy that was significantly greater than chance, $M_{\text{Hits}} = .33$, $SD = .15$; $M_{\text{False alarms}} = .29$, $SD = .17$; $M_{A'} = .54$, $SD = .10$; $t(37) = 2.72$, $p = .009$, $r = .41$, and showed a bias toward categorizing targets as living more often than deceased ($M_{B''} = .09$, $SD = .11$). Similarly, psychotherapists were also able to categorize the targets significantly better than chance, $M_{\text{Hits}} = .28$, $SD = .14$; $M_{\text{False alarms}} = .23$, $SD = .15$; $M_{A'} = .57$, $SD = .10$; $t(35) = 4.12$, $p < .001$, $r = .57$, and showed a bias toward categorizing targets as living, as well ($M_{B''} = .14$, $SD = .15$). Comparisons between the two groups showed that psychotherapists were nonsignificantly more accurate than controls: $t(72) = 1.03$, $p = .31$, $r = .12$. Neither therapists' years of experience ($r = .14$, $p = .42$) nor level of education ($F_s < 0.17$, $p_s > .95$, $\eta^2_{\text{partial}} < .02$) were significantly related to their accuracy. Psychotherapists therefore possess no significant advantage or deficit compared to control participants in their capacity to judge from a photograph whether an individual has committed suicide.

General Discussion

Here we found that suicidality could be judged from the face at levels significantly greater than chance. High school, college, and university yearbook photographs therefore appear to provide information allowing various populations (i.e., undergraduates, online respondents, and psychotherapists) to distinguish between students who have committed suicide and their living classmates better than guessing. Upon further study, we determined that people could perform this task accurately even when the pictures they viewed were limited to the internal features of the face. Finally, we were able to show that individuals who had committed suicide were perceived as more impulsive than their living counterparts, and this effect appeared to be specific to impulsive violence. However, it is important to note that impulsive behavior, in general, is unlikely to uniquely predict whether an individual commits suicide (McGirr & Turecki, 2007). Indeed, suicide victims in the current research were not perceived to be any more likely to engage in impulse buying or impulsive sexual experiences.

Some scholars maintain that individuals who commit suicide are predisposed toward doing so (McGirr & Turecki, 2007). Indeed, it has been shown that trait impulsivity measured early in life predicts suicidal behavior into adulthood (Caspi et al., 1996). However, it is likely that a recursive relationship between genetic and environmental factors ultimately influences whether one commits suicide (Bridge, Goldstein, & Brent, 2006; McGirr & Turecki, 2007).

Moreover, although no differences were found between the two groups with respect to perceptions of depression, life satisfaction, and hopelessness, these variables are important contributors to predicting suicide (Brown et al., 2000; Javdani et al., 2011; Kashden et al., 1993; Koivumaa-Honkanen et al., 2001; Sokero et al., 2005). The absence of effects for these variables may be an indication of their limited legibility from facial cues, and also serves to affirm that the distinction between the faces of suicide victims and living controls was not based on obvious displays of affect-related variables. Additionally, the greater proportion of male versus female targets in our sample might have contributed to this distinction. Men are more likely to commit suicide in the United States (World Health Organization, 2012), in part because of increased levels of aggression and the use of irremediable methods in suicide attempts (Brent, Baugher, Bridge, Chen, & Chiappetta, 1999). The potential for greater impulsivity among male suicide victims may have influenced the observation of smaller differences in perceived depression and greater differences in perceived impulsivity between suicide victims and living controls in the present work (see Apter et al., 1995).

Naturally, this work is not without limitations. The stimuli used in these experiments largely consisted of convenience samples of individuals that were either known to us or our acquaintances personally, or retrieved from public online sources. Thus, there may be unforeseen confounds in the stimuli that might have influenced the results. Also relevant, the observation of differences between the suicide victims and controls in terms of depression, impulsivity, and other qualities were based entirely on perceptions. Ideally, these findings would be confirmed by clinical evaluations or targets' self-reports. Future work could potentially ameliorate these deficits in the present work.

In addition, future work may consider the role of facial morphology and how that may contribute to these effects. Although the targets' faces here signaled something of their suicidality, further investigation may seek to understand how these differences are manifest in the face. One potential avenue might be the consideration of facial width-to-height ratio, which has been previously found to serve as a valid cue to aggression in men (Carré, McCormick, & Mondloch, 2009). Although coding of the current faces showed no differences between suicide victims and living controls in facial width-to-height ratios, $t(39) = 0.84, p = .41, r = .13$, these differences might be more pronounced in a larger, all-male sample.

Such investigations might also consider the role that stereotypes about depressed, suicidal, or impulsive individuals might play in the correct or incorrect inference of a target's suicidality. Indeed, despite a large literature showing accuracy in judgments from facial and nonverbal cues (Ambady & Skowronski, 2008), there are many cases in which such judgments may be inaccurate (e.g., DePaulo & Rosenthal, 1979; Zebrowitz, Voinescu, & Collins, 1996). Thus, although we observed significant differences between suicide victims and controls in the current work, these data should not be misconstrued as suggesting that impulsivity, depression, or other pathologies should necessarily be expected to be legible from the face or other nonverbal cues. Moreover, these findings do not necessarily suggest that

the perception of suicidality from faces ought to be adopted as a tool for clinical diagnosis. Indeed, given that previous work has illustrated how utilizing information about base rates can blindly lead to better judgments than relying on facial cues (Olivola & Todorov, 2010), the detection of suicidality from faces should not replace existing clinical measures. Rather, this work speaks more to the basic phenomena surrounding the expression and perception of suicidality at rates that are statistically significant but perhaps only modest in practical significance (i.e., a mean identification rate of 55%). These data are nevertheless informative for expanding our understanding of the communicative power of the face in social perception and for the ability of naïve perceivers to reliably extract information about others from facial cues.

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Notes

1. Stimuli were presented and responses collected via computer for all of the studies reported in this work. In addition, participants always represented independently sampled groups that did not overlap.
2. Male and female targets and participants did not differ in the studies reported in this work ($ts < 1.63, ps > .11, rs < .29$) except for several exceptions: male targets were perceived as more impulsive, $t(78) = 4.49, p < .001, r = .45$, and less satisfied with life, $t(78) = 4.32, p < .001, r = .44$, than female targets in Study 2; and more likely to be involved in a violent altercation, $t(78) = 15.54, p < .001, r = .87$, in Study 3. Repeating the analyses on the postregression residual scores in which the effect of target gender was removed did not change the results for any of these variables.

References

- Abel, E. L., & Kruger, M. L. (2010). Smile intensity in photographs predicts longevity. *Psychological Science, 21*, 542–544.
- Ambady, N., & Skowronski, J. (Eds.). (2008). *First impressions*. New York, NY: Guilford.
- Apter, A., Gothelf, D., Orbach, I., Weizman, R., Ratzoni, G., Har-Even, D., & Tyano, S. (1995). Correlation of suicidal and violent behavior in different diagnostic categories in hospitalized adolescent patients. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 912–918.
- Baumeister, R. F. (2002). Yielding to temptation: Self-control failure, impulsive purchasing, and consumer behavior. *Journal of Consumer Research, 28*, 670–676.
- Brent, D. A., Baugher, M., Bridge, J., Chen, T., & Chiappetta, L. (1999). Age- and sex-related risk factors for adolescent suicide. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*, 1497–1505.

- Bridge, J. A., Goldstein, T. R., & Brent, D. A. (2006). Adolescent suicide and suicidal behavior. *Journal of Child Psychology and Psychiatry*, *47*, 372–394.
- Brown, G. K., Beck, A. T., Steer, R. A., & Grisham, J. R. (2000). Risk factors for suicide in psychiatric outpatients: A 20-year prospective study. *Journal of Consulting and Clinical Psychology*, *68*, 371–377.
- Brunswik, E. (1956). *Perception and the representative design of psychological experiments*. Berkeley: University of California Press.
- Carré, J. M., McCormick, C. M., & Mondloch, C. J. (2009). Facial structure is a reliable cue of aggressive behavior. *Psychological Science*, *20*, 1194–1198.
- Caspi, A., Moffitt, T. E., Newman, D. L., & Silva, P. A. (1996). Behavioral observations at age 3 years predict adult psychiatric disorders. *Archives of General Psychiatry*, *53*, 1033–1039.
- Collins, M. A., & Zebrowitz, L. A. (1995). The contributions of appearance to occupational outcomes in civilian and military settings. *Journal of Applied Social Psychology*, *25*, 129–163.
- DePaulo, B. M., & Rosenthal, R. (1979). Telling lies. *Journal of Personality and Social Psychology*, *37*, 1713–1722.
- Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, *24*, 285–290.
- Funder, D. C. (1995). On the accuracy of personality judgment: A realistic approach. *Psychological Review*, *102*, 652–670.
- Hall, C. C., Ariss, L., & Todorov, A. (2007). The illusion of knowledge: When more information reduces accuracy and increases confidence. *Organizational Behavior and Human Decision Processes*, *103*, 277–290.
- Heller, M., Haynal-Reymond, V., Haynal, A., & Archinard, M. (1997). Can faces reveal suicide attempt risks? In M. Heller (Ed.), *The flesh of the soul: The body we work with* (pp. 243–269). Bern, Switzerland: Peter Lang.
- Henderson, J. J. A., & Anglin, J. M. (2003). Facial attractiveness predicts longevity. *Evolution and Human Behavior*, *24*, 351–356.
- Hertenstein, M. J., Hansel, C. A., Butts, A. M., & Hile, S. N. (2009). Smile intensity in photographs predicts divorce later in life. *Motivation and Emotion*, *33*, 91–105.
- Hillbrand, M. (1995). Aggression against self and aggression against others in violent psychiatric patients. *Journal of Consulting and Clinical Psychology*, *63*, 668–671.
- Javdani, S., Sadeh, N., & Verona, E. (2011). Suicidality as a function of impulsivity, callous-unemotional traits, and depressive symptoms in youth. *Journal of Abnormal Psychology*, *120*, 400–413.
- Kashden, J., Fremouw, W. J., Callahan, T. S., & Franzen, M. D. (1993). Impulsivity in suicidal and nonsuicidal adolescents. *Journal of Abnormal Child Psychology*, *21*, 339–353.
- Koivumaa-Honkanen, H., Honkanen, R., Viinamaki, H., Heikkila, K., Kaprio, J., & Koskenvuo, M. (2001). Life satisfaction and suicide: A 20-year follow-up study. *American Journal of Psychiatry*, *158*, 433–439.
- Litman, R. E., Curphey, T., Shneidman, E. S., Farberow, N. L., & Tabachnick, N. (1963). Investigations of equivocal suicides. *Journal of the American Medical Association*, *184*, 924–929.
- Macmillan, N. A., & Creelman, C. D. (2005). *Detection theory: A user's guide* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.
- McGirr, A., & Turecki, G. (2007). The relationship of impulsive aggressiveness to suicidality and other depression-linked behaviors. *Current Psychiatry Reports*, *9*, 460–466.
- Nock, M. K., Hwang, I., Sampson, N. A., & Kessler, R. C. (2010). Mental disorders, comorbidity and suicidal behaviour: Results from the national comorbidity survey replication. *Molecular Psychiatry*, *15*, 868–876.
- Olivola, C. Y., & Todorov, A. (2010). Fooled by first impressions? Reexamining the diagnostic value of appearance based inferences. *Journal of Experimental Social Psychology*, *46*, 315–324.
- O'Sullivan, M. (2008). Home runs and humbugs: Comment on Bond and DePaulo. *Psychological Bulletin*, *134*, 493–497.
- Ougrin, D., Zundel, T., Kyriakopoulos, M., Banarsee, R., Stahl, D., & Taylor, E. (2011). Adolescents with suicidal and nonsuicidal self-harm: Clinical characteristics and response to therapeutic assessment. *Psychological Assessment*, *24*, 11–20.
- Rule, N. O., & Ambady, N. (2008). Brief exposures: Male sexual orientation is accurately perceived at 50-ms. *Journal of Experimental Social Psychology*, *44*, 1100–1105.
- Rule, N. O., & Ambady, N. (2010). Democrats and Republicans can be differentiated from their faces. *PLoS ONE*, *5*, e8733.
- Rule, N. O., Ambady, N., Adams, R. B., & Macrae, C. N. (2008). Accuracy and awareness in the perception and categorization of male sexual orientation. *Journal of Personality and Social Psychology*, *95*, 1019–1028.
- Rule, N. O., Garrett, J. V., & Ambady, N. (2010). Faces and places: Geographic environment influences the ingroup memory advantage. *Journal of Personality and Social Psychology*, *98*, 343–355.
- Samochowiec, J., Wanke, M., & Fiedler, K. (2010). Political ideology at face value. *Social Psychological and Personality Science*, *1*, 206–213.
- Simon, T. R., Swann, A. C., Powell, K. E., Potter, L. B., Kresnow, M., & O'Carroll, P. W. (2001). Characteristics of impulsive suicide attempts and attempters. *Suicide and Life-Threatening Behavior*, *32*, 49–59.
- Sokero, T. P., Melartin, T. K., Rytsala, H. J., Leskela, U. S., Lestela-Mielonen, P. S., & Isometsa, E. T. (2005). Prospective study of risk factors for attempted suicide among patients with DSM-IV major depressive disorder. *The British Journal of Psychiatry*, *186*, 314–318.
- Sporer, S. L. (2001). Recognizing faces of other ethnic groups: An integration of theories. *Psychology, Public Policy, and Law*, *7*, 36–97.
- World Health Organization (2012). *Suicide Prevention*. Retrieved March 7, 2012, from http://www.who.int/mental_health/prevention/suicide/suicideprevent/en/
- Zebrowitz, L. A. (1997). *Reading faces: Window to the soul?* Boulder, CO: Westview.
- Zebrowitz, L. A., Kikuchi, M., & Fellous, J. M. (2010). Facial resemblance to emotions: Group differences, impression effects, and race stereotypes. *Journal of Personality and Social Psychology*, *98*, 175–189.
- Zebrowitz, L. A., & McDonald, S. M. (1991). The impact of litigants' baby-facedness and attractiveness on adjudications in small claims courts. *Law and Human Behavior*, *15*, 603–623.
- Zebrowitz, L. A., Voinescu, L., & Collins, M. A. (1996). "Wide-eyed" and "crooked-faced": Determinants of perceived and real honesty across the life span. *Personality and Social Psychology Bulletin*, *22*, 1258–1269.

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