HHS Public Access

Author manuscript

Arch Suicide Res. Author manuscript; available in PMC 2021 February 09.

Published in final edited form as:

Arch Suicide Res. 2018 ; 22(1): 32–45. doi:10.1080/13811118.2017.1304309.

A Social Exclusion Manipulation Interacts with Acquired Capability for Suicide to Predict Self-Aggressive Behaviors

Jennifer L. Hames,
Department of Psychology, University of Notre Dame, South Bend, Indiana, USA.

Megan L. Rogers,
Department of Psychology, Florida State University, Tallahassee, Florida, USA.

Caroline Silva,
Department of Psychology, Florida State University, Tallahassee, Florida, and Department of Psychiatry, University of Rochester Medical Center, Rochester, New York, USA.

Jessica D. Ribeiro,
Department of Psychology, Florida State University, Tallahassee, Florida, USA.

Nadia E. Teale,
United States Air Force, USA.

Thomas E. Joiner
Department of Psychology, Florida State University, Tallahassee, Florida, USA.

Abstract

The interpersonal theory of suicide posits that individuals who simultaneously experience high levels of thwarted belongingness, perceived burdensomeness, and acquired capability for suicide are at high risk for a lethal or near-lethal suicide attempt. Although supported by self-report studies, no study has examined facets of the theory experimentally. The present study aimed to examine the belongingness and capability components of the theory by testing whether experimentally manipulated social exclusion interacts with self-reported acquired capability to predict higher self-administered shock levels on a self-aggression paradigm. A sample of 253 students completed self-report measures and were then randomly assigned to a social exclusion manipulation condition (future alone, future belonging, no feedback). Participants then participated in the self-aggression paradigm. The positive association between acquired capability and self-aggression was strongest among participants in the future alone social exclusion condition. In those assigned to the future belonging or no feedback conditions, the association between acquired capability and self-aggression was non-significant. These findings provide modest experimental support for the interpersonal theory of suicide and highlight a potential mechanism through which social exclusion may impact suicide risk. Limitations and future research directions are discussed.

Correspondence concerning this article should be addressed to Thomas Joiner, Department of Psychology, Florida State University, 1107 W. Call St., Tallahassee, FL 32306. joiner@psy.fsu.edu.

Keywords

acquired capability; interpersonal theory of suicide; social exclusion; suicide; thwarted belongingness

Each year, over 800,000 lives are lost to suicide worldwide (World Health Organization [WHO], 2014), a rate that does not appear to be decreasing over time (Centers for Disease Control and Prevention [CDC], 2016; WHO, 2014). To help explain this phenomenon and work toward developing effective interventions, a number of theories have been proposed, most notably the interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010). Unlike its predecessors, including the escape (Baumeister, 1990) and psychache (Shneidman, 1993) theories of suicide, and many other identified risk factors for suicide (e.g., depression, hopelessness; (Beck, Steer, Kovacs, & Garrison, 1985; Hawton, Casañas i Comabella, Haw, & Saunders, 2013), the interpersonal theory of suicide explicitly differentiates those who go on to attempt suicide from those who only desire it, thus fitting into the ideation-to-action framework (Klonsky & May, 2014).

Specifically, the interpersonal theory posits that to die by suicide an individual must have both the desire and the capability to do so. The theory asserts the simultaneous experience of thwarted belongingness (i.e., loneliness and social disconnection) and perceived burdensomeness (i.e., feeling like a burden on others) results in a desire for death. However, only those who also possess the capability to enact lethal self-harm will go on to attempt or die by suicide. This capability, termed the “acquired capability” for suicide (Joiner, 2005; Van Orden et al., 2010), consists of an elevated fearlessness about death, pain, injury, and suicide, as well as a heightened physical pain tolerance—both of which are necessary to confront fearsome stimuli associated with suicidal behavior and override biological mechanisms for survival (Öhman & Mineka, 2001). Some propose that the acquired capability has a genetic basis (Smith et al., 2012) and is increased through repeated exposure to painful and provocative events (Bender, Gordon, Bresin, & Joiner, 2011), though recent theory and evidence suggest an expansion of capability into several components: dispositional, acquired, and practical capability (Klonsky & May, 2015).

Existing evidence is supportive of the claims of the interpersonal theory of suicide in a wide variety of samples, including college students, community members, psychiatric outpatients and inpatients, and military personnel (Anestis & Joiner, 2011; Bryan, Clemans, & Hernandez, 2012; Christensen, Batterham, Soubelet, & Mackinnon, 2013; Chu, Buchman-Schmitt, Hom, Stanley, & Joiner Jr., 2016; Joiner et al., 2009). Furthermore, supporting the theory’s overarching prediction that components of the theory interact to predict suicidal behavior, Van Orden et al. (2008) found that the interaction of perceived burdensomeness and thwarted belongingness predicted suicidal ideation, and that higher acquired capability was found among individuals with a greater number of past suicide attempts. In addition, Joiner et al. (2009) replicated the interaction between perceived burdensomeness and thwarted belongingness in predicting current suicidal ideation, and also demonstrated that the three-way interaction between perceived burdensomeness, thwarted belongingness, and a proxy for the acquired capability for suicide predicted a recent suicide attempt. Importantly,

the three-way interaction was significant above and beyond a number of covariates, including demographic variables; family history of suicide; current and past diagnoses of depression and bipolar disorder; and current depressive symptoms, hopelessness, and borderline personality disorder features.

Though the interpersonal theory of suicide has ample support as a theoretical model for suicidal behavior, the majority of studies, to date, have been limited to primarily self-report measures. Although self-report is invaluable in enabling researchers to understand aspects about thoughts, emotions, and behaviors that are unobservable, there are also disadvantages, including accuracy of self-perceptions, a tendency to respond in a manner that interferes with the validity of a response (Paulhus, 1991), and the validity of self-report measures in convergence with other methods of measurement (Paulhus & Vazire, 2007). Behavioral measures limit these disadvantages and allow for the observation of how participants *act*, as opposed to how participants *say* they would act in a given situation (Furr & Funder, 2007; McDonald, 2008). Experimental designs are also informative, as they allow for interpretations about the causality of factors. Further, experimental designs allow for randomization of participants into conditions, which helps to limit influences of external variables; if randomization is successful, individual differences and external influences should affect all groups equally (Kirk, 2012).

Because suicide is ethically not able to be manipulated experimentally, lab-based paradigms assessing self-harm and self-aggression may serve as useful alternatives. Previous research examining self-aggression paradigms, specifically, indicate that these tasks are positively associated with self-aggressive tendencies (Berman & Walley, 2003), engagement in and frequency of non-suicidal self-injury (McCloskey, Look, Chen, Pajoumand, & Berman, 2012), and suicidal ideation and behavior (Berman & Walley, 2003; McCloskey & Berman, 2003). This suggests that self-aggression laboratory paradigms may be useful alternatives for testing theoretical models in a way that cannot be done through the manipulation of suicidal ideation and behavior.

Thus, the present study represents an initial effort to assess components of the interpersonal theory of suicide experimentally, using a mixed-methods approach. Specifically, we measured self-reported acquired capability, followed by a well-validated laboratory-based procedure manipulating social exclusion (Twenge, Baumeister, Tice, & Stucke, 2001), which served as a proxy for thwarted belongingness. Participants then completed a validated behavioral measure of self-aggressive behavior (Berman & Walley, 2003). We hypothesized that there would be a significant interaction between the experience of social exclusion and the acquired capability in predicting higher self-administered shock levels. More specifically, we expected that the positive association between social exclusion and self-administered shock levels would be strongest among participants with high levels of acquired capability.

METHODS

Participants

Participants were 253 college students (67.2% female) between the ages of 18 and 30 (M = 18.96; SD = 1.47) from a large southeastern university. The majority of the sample self-identified as Caucasian (77.9%), with 15.8% African American, 5.1% Asian, 1.6% American Indian/Alaskan Native, and 1.2% Native Hawaiian/Pacific Islander. Further, 15.8% identified as Hispanic/Latino. The majority of the sample was right-handed (96.8%).[1] A small minority of participants (3.2%) reported a past history of suicide attempts (1.6% a single attempt, 1.6% multiple past attempts). Participants received course credit for completion of the study.

Procedures and Measures

Prior to beginning the study, all participants were advised via the web advertisement that they should not complete the study if they had any of the following conditions: heart arrhythmia, history of heart attack, history of chest pains, heart murmur, or history of heart surgery. Participants were also advised that they would not be allowed to complete the study if they endorsed any of the following exclusionary criteria: consuming any pain medication 8 hours prior to participation, consuming alcohol or sugary foods 1 hour prior to the study, or smoking, as these behaviors are thought to influence pain perception (Mercer & Holder, 1997; Pomerleau, Turk, & Fertig, 1984). Upon arriving for the experimental session, participants were verbally rescreened by an experimenter for any known heart problems or behaviors which may influence pain perception. Those who endorsed any of these items were not permitted to complete the experiment and were provided with a brief rationale for their exclusion. All other participants were cleared to undergo study protocols and provided written informed consent. All study procedures were approved by the university's Institutional Review Board.

Next, participants completed self-report measures, including the 20-item Acquired Capability for Suicide Scale (ACSS; Bender et al., 2011), which assesses levels of acquired capability (i.e., fearlessness about death, pain, injury, and suicide) on a 5-point scale, ranging from 0 (*Not at all like me*) to 4 (*Very much like me*). Higher ACSS scores reflect greater acquired capability for suicide (α = .83). Participants also completed the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003), a measure of the Big Five personality dimensions, which provided the basis for the social exclusion manipulation (extraversion level) and assessed neuroticism, which was included as a covariate to ensure that results were not better accounted for by general fearfulness/fearlessness, as opposed to acquired capability for suicide.

Social Exclusion Manipulation.—Following procedures utilized by Twenge et al. (2001), participants were randomly assigned to one of three feedback conditions: no-feedback control (n = 85), future belonging (n = 83), or future alone (n = 85). Participants

[1]Given documented differences in pain perceptions between left- and right-handed individuals, hypotheses were examined controlling for handedness.

were told that the measure would provide certain information about their personalities (and its consequences for their future). To establish credibility, participants were provided with accurate feedback regarding their level of extraversion (high, medium, low). Participants in the no-feedback control condition received no further information. Participants in the future belonging or future alone conditions received the following bogus, scripted feedback about the implications of their extraversion scores for their future social expectations:

The Future Alone Script stated, “You’re the type who will end up alone later in life. You may have friends and relationships now, but by your mid-20s most of these will have drifted away. You may even marry or have several marriages, but these are likely to be short-lived and not continue into your 30s. Relationships don’t last, and when you’re past the age where people are constantly forming relationships, the odds are you’ll end up being alone more and more.”

The Future Belonging script stated, “You’re the type who has rewarding relationships throughout life. You’re likely to have a long and stable marriage and have friendships that will last into your later years. The odds are that you’ll always have friends and people who care about you.”

The future alone condition is intended to induce feelings of social exclusion and anticipation of a lonely future. Studies using this paradigm have reported that participants in the future alone condition endorsed lower levels of belongingness and trust (Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007), more self-defeating behaviors (Twenge, Catanese, & Baumeister, 2002), and less prosocial behavior (Twenge et al., 2007) following the manipulation, compared to participants in the future belonging and control conditions. Further, social disconnection and loneliness are central features of thwarted belongingness, and the expectancy that this social exclusion will not change reflects a core component of the interpersonal theory of suicide (Van Orden et al., 2010).

Following the social exclusion manipulation, participants completed the Impressions of Personality Feedback Questionnaire (adapted from Swann, Griffin, Predmore, & Gaines, 1987), a 4-item measure that assessed participants’ perceptions of the accuracy and descriptiveness of their personality feedback. Participants were also asked to rate the accuracy of the feedback, how much they agreed with the feedback, how well thought-out the feedback was, and how much a stranger could learn about them based on the feedback. Responses were on a 9-point scale, with total scores ranging from 4 to 36; lower scores indicate greater perceived accuracy of the feedback ($\alpha = .88$).

Self-Aggression Paradigm.—A modified version of the Self-Aggression Paradigm (SAP; see Sloan, Berman, Zeigler-Hill, Greer, & Mae, 2006 for detailed procedures) was used as a laboratory measure of self-aggressive behavior and was presented as a competitive reaction time task. Participants competed against a computer that, participants are told, has been programmed to respond like an average undergraduate student on the reaction time task. Participants were instructed to select, from 10 choices, the level of shock they would receive if they had the slower reaction time.

The SAP involved attaching electrodes to each participant's non-dominant hand; the electrodes were connected to an electrical shock machine which interfaces with a computer program. Both the shock machine and computer program were custom built by the department's in-house machine shop for this purpose. The program was designed to run the reaction time task and control shock duration. It was pre-programmed to deliver a 500 millisecond shock to participants, regardless of actual reaction time, about 50% of the time. Participants' median reaction time over 3 practice trials and integrating all subsequent trials was used as the basis for determining when participants would receive a shock.

Prior to the task, lower and upper shock level thresholds were determined for each participant and used to anchor the lower and upper shock intensity values from which participants could select. All 255 levels of shock intensity to which participants could be exposed were set at safe levels: shocks ranged from 0.4 milliamps to 5.5 milliamps. Lower thresholds were reflective of the point at which the participant was able to detect a shock, whereas upper thresholds were equivalent to the point at which the shock level was too painful or unpleasant to tolerate by the participant. Specifically, shock intensities ranged from 1 (corresponding to participant lower threshold) to 10 (corresponding to participant upper threshold), with levels 2 through 9 scaled between. Instructions for the task were presented via a standard computer monitor in a box at the center of the screen.

The SAP consisted of 3 practice and 22 reaction-time trials between the participant and the computer. Each trial consisted of (1) a signal to set the intensity of the shock participants would receive if they have the slower reaction time; (2) a signal to depress the reaction time key; (3) a signal to release the reaction time key as fast as possible; (4) either a delay or the receipt of a one-second shock dependent upon the win/loss condition for that trial; and (5) a 5 second inter-trial interval. Practice trials were identical to reaction-time trials. For the self-aggression index used in analyses, we used the mean shock levels of the first ten non-practice trials (i.e., trials 4–13), as habituation to the task and habituation to social exclusion condition may influence shock level selection. All participants had the same number of shock opportunities and selected shock intensity levels for every trial; however, number of actual shocks varied based on the reaction time task. Following the SAP, participants completed a questionnaire (adapted from Berman & Walley, 2003) assessing whether competitiveness influenced task performance.

Validity data for the SAP indicate that the SAP is positively associated with self-reported self-aggressive tendencies (Berman & Walley, 2003), engagement in and frequency of non-suicidal self-injury (McCloskey et al., 2012), and suicidal ideation and behavior (Berman & Walley, 2003; McCloskey & Berman, 2003). In contrast, the SAP is unrelated to hopelessness, impulsivity, risky decision making, competitiveness, or antisocial or aggressive behaviors directed toward others (Berman & Walley, 2003; McCloskey & Berman, 2003; McCloskey et al., 2012), providing evidence of the task's discriminant validity. We emphasize that, because this task has been associated with self-injurious thoughts and behaviors, both with and without suicidal intent, the SAP is a measure of self-aggressive, rather than suicidal, behaviors.

Manipulation Check and Debriefing Procedures.—The experimenter prompted participants to disclose suspicions about and rate the believability of the procedures. Participants were thoroughly debriefed and queried regarding any negative side-effects from participation. Specifically, they were informed of the bogus nature of the personality type feedback they received and assured that it was in no way based on the answers to any data collected during the experimental session.

Data Analytic Strategy

Descriptive statistics and bivariate correlations were first computed to determine the normality and interrelatedness of all study variables. A moderation analysis was conducted to test the hypothesis that there existed a significant interaction between acquired capability and social exclusion in predicting self-aggression. Acquired capability (centered prior to moderation analyses) served as the independent variable, social exclusion condition (dummy-coded) as the moderator variable, and self-aggression as the outcome variable. Handedness and neuroticism were included as covariates. Effect size statistics (f^2) were calculated to determine the unique variance explained by the interaction term (Aiken, West, & Reno, 1991), with .005 representing a small effect, .01 a medium effect, and .025 a large effect (Aguinis, Beaty, Boik, & Pierce, 2005). Lastly, we probed significant interactions, following the recommendations of Cohen, Cohen, West, and Aiken (2013), and plotted the regression line. Analyses were conducted in SPSS 22.0.

RESULTS

Preliminary Analyses

Means, standard deviations, ranges, and bivariate correlations for all study variables are presented in Table 1. All variables were normally distributed; thus, no transformations were conducted. Importantly, the social exclusion manipulation was unrelated to all other variables, indicating successful randomization and that social exclusion alone does not affect the self-aggression proxy variable. As expected, acquired capability scores were higher in males and positively associated with the self-aggression paradigm. Acquired capability scores were also positively associated with neuroticism.

To determine whether the manipulation functioned as expected, perceived accuracy and believability of the feedback was compared across the three conditions. Results of a one-way ANOVA indicated that perceived accuracy/believability of feedback significantly differed across conditions ($F[2, 248] = 30.65$, $p < .001$). Specifically, the future alone condition ($M = 20.34$, $SD = 3.03$) was rated as significantly less accurate/believable than the future belonging ($M = 16.73$, $SD = 3.28$, $p < .001$) and control ($M = 17.05$, $SD = 3.62$, $p < .001$) conditions. The future belonging and control conditions did not significantly differ ($p = .543$).

Moderation Analysis

A moderation analysis was conducted to examine whether the interaction between social exclusion condition and acquired capability was a significant predictor of self-aggression. Results (see Table 2) indicated that the overall model explained 6.5% of the variance in self-

aggression. The two-way interaction of the future alone condition and acquired capability was a significant predictor of self-aggression ($p = .049$, $f^2 = .015$), controlling for handedness ($p = .513$), neuroticism ($p = .465$),[2] the main effect of condition ($p = .475$), and the main effect of acquired capability ($p = .100$). As seen in Figure 1, the form of the interaction was as expected; the strength of the relationship between acquired capability and self-aggression was greater within the future alone condition ($\beta = .36$, $p = .001$) than for those in the no-feedback ($\beta = .16$, $p = .149$) and future belonging ($\beta = .07$, $p = .506$) groups. Notably, the association between acquired capability and self-aggression was non-significant in the non-future-alone groups.

Follow-up analyses were conducted to examine the two components of acquired capability —fearlessness about death and physical pain tolerance/exposure to provocative events—in relation to the social exclusion manipulation and self-aggression. Specifically, the 7-item fearlessness about death subscale (Ribeiro et al., 2014) was substituted for the 20-item ACSS to examine whether one or both facets of acquired capability account for these findings. Results indicated that the interaction between fearlessness about death and the social exclusion condition was non-significant ($\beta = .13$, $p = .101$), suggesting that other facets of acquired capability may explain these findings, though it is important to note that the change in effect size was small.

DISCUSSION

The present study tested a facet of the interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010) using an experimental design. Results provided evidence for a statistically significant interaction, albeit with a small effect size, between social exclusion and acquired capability in predicting levels of self-administered shock (i.e., self-aggressive behavior). Specifically, the strength of the association between the acquired capability for suicide and self-aggression was greatest for those who underwent the social exclusion manipulation. These findings provide experimental evidence for components of the interpersonal theory of suicide and suggest that acquired capability and social exclusion can interact to predict self-aggressive behavior within the brief timeframe of a laboratory experiment (i.e., approximately 10–15 minutes).

Despite the fact that the intent of participants' self-aggressive behavior was not assessed, participants' mean shock levels provided behavioral information that may reflect suicide risk. Namely, in selecting higher levels of shock in the SAP, an individual is indicating not only heightened pain tolerance, but also a willingness to self-inflict higher levels of pain. As the interpersonal theory of suicide posits that a person must have both the desire and capability to die by suicide (Van Orden et al., 2010), the SAP may assess both potent and necessary factors that confer risk for death by suicide. Moreover, because pain related to social rejection may operate on physical pain pathways in the brain, thereby reducing pain sensitivity (DeWall & Baumeister, 2006; Macdonald & Leary, 2005), it is possible that

[2]Notably, the interaction between social exclusion and acquired capability remained significant after removing neuroticism as a covariate. It dropped from significance when age ($p = .052$) and gender ($p = .134$) were included as covariates; however, we opted only to include handedness and neuroticism as covariates due to the preliminary nature of this experimental test and already-established relationships between gender and acquired capability.

social exclusion, in conjunction with high baseline levels of acquired capability (particularly pain tolerance/exposure to provocative events, as analyses examining fearlessness about death exclusively were non-significant), may facilitate the transition from suicidal ideation to suicidal behavior. In this sample, it was the combination of the social exclusion condition and high levels of acquired capability that resulted in the highest shock levels, as opposed to social exclusion alone. Indeed, interestingly and in contrast to past research demonstrating associations between social rejection and reduced pain sensitivity (DeWall & Baumeister, 2006; Kross, Berman, Mischel, Smith, & Wager, 2011), results from main effects indicated that those in the belonging condition exhibited marginally higher shock levels than those in the neutral or alone conditions. We also note that limitations regarding the validity of the SAP as a measure of self-injurious behavior and the nature of our sample should be addressed in future research before drawing conclusions about the interactive nature of social exclusion and acquired capability in increasing risk for suicidal behaviors. Furthermore, because participants had varying upper thresholds on the SAP, pain tolerance cannot be definitively determined from these analyses. Nonetheless, the SAP measures non-lethal forms of self-aggression and may additionally reflect risk for non-suicidal self-injury (NSSI), a potent risk factor and means for developing the capability to die by suicide (Joiner, Ribeiro, & Silva, 2012) and for suicidal behaviors themselves (Klonsky, May, & Glenn, 2013).

There are several alternative explanations for the social exclusion manipulation that should be more fully explored in future research, however. Given that no control group was given negative, non-social feedback, or negative social feedback without a loss of belonging (e.g., “you will have a lot of arguments and disagreements, but you will have long-term relationships”), we were unable to determine whether our findings resulted from social exclusion feedback specifically, as opposed to negative feedback more generally. The future-alone manipulation also manipulates long-term anticipated social exclusion, in contrast to immediate social exclusion in a given moment. Short-term social exclusion has been associated with aggressive behaviors toward others and hostile cognitions (DeWall, Twenge, Gitter, & Baumeister, 2009; Twenge et al., 2001), whereas long-term social exclusion relates to depression and numbness. It is possible that this manipulation thus taps into the relation between hopelessness and suicidality; however, conclusions cannot be made based on the present results. As such, differentiation of short-term and long-term social exclusion within the context of experimental tests of the interpersonal theory of suicide will be an important avenue for research moving forward.

Additional limitations should also be taken into consideration when interpreting our results. First, the ecological validity of the social exclusion manipulation and the SAP can be questioned, though numerous studies have supported the use of both. For instance, in previous research (Berman & Walley, 2003; McCloskey & Berman, 2003), the SAP has been conceptualized as a laboratory index of intentional self-injurious behavior that complements non-laboratory measures of suicidal behavior. However, this task has not been explicitly validated as a proxy for self-injurious behavior, much less intentional self-injury; as such, we emphasize that our findings should be interpreted as predicting severity of self-aggressive behavior. Moreover, the validity of laboratory aggression paradigms has been a debated issue in the extant literature (Giancola & Chermack, 1998; Ritter & Eslea, 2005;

Tedeschi & Quigley, 1996, 2000). Many criticisms question whether these tasks measure aggression at all and instead measure competitiveness, as well as the lack of measurement of intentions or motivations of participants (Giancola & Chermack, 1998; Tedeschi & Quigley, 1996). As noted previously, initial validation indicates that the SAP is *not* related to competitiveness and instead is strongly associated with self-aggressive tendencies and moderately associated with self-injurious behaviors (Berman & Walley, 2003; McCloskey & Berman, 2003; McCloskey et al., 2012). More generally, a meta-analysis of laboratory aggression studies indicated that these laboratory studies, in fact, have strong external validity (Anderson & Bushman, 1997), thereby increasing our confidence in the validity of the SAP as a measure of self-aggressive behaviors.

Further, this study did not examine an experimental manipulation of acquired capability, nor, importantly, did it assess the third component of the interpersonal theory of suicide, perceived burdensomeness. No validated experimental manipulations of perceived burdensomeness existed at the time of data collection; as such, this remains an important avenue for future research. However, we did statistically control for a fear-related construct (neuroticism), increasing our confidence that any effects were attributable specifically to acquired capability. Nonetheless, conclusions as to whether the three-way interaction among behavioral measures of perceived burdensomeness, thwarted belongingness, and acquired capability would have similar influence on self-aggressive behaviors cannot be made, although recent evidence has supported the theory's propositions using self-report methodology (Joiner et al., 2009). For a more comprehensive test of the theory, future research should include perceived burdensomeness, particularly if burdensomeness were to be manipulated experimentally in a similar manner to the social exclusion manipulation.

Another concern is that the feedback manipulation was less believable for individuals in the future alone condition as opposed to the future belonging and control conditions. It is possible that the feedback manipulation was inadequate in some respect, such that it was not strong enough to fully engage participants' views. However, it is worth noting that believability scores in the future alone condition were still in the moderately believable range ($M = 20.12$ with a possible range of 4 to 36). To address these concerns, future studies might consider the development of a feedback manipulation that is more realistic for participants, though ethical considerations and feasibility of obtaining such information may be barriers to this process. Further, participants may require more time or more prompting to process feedback received during the manipulation (e.g., writing about experiences that supported predictions of the feedback). Nevertheless, that there were significant findings despite differences in participants' belief in the feedback is encouraging.

Finally, we did not have data on psychiatric diagnoses or levels of psychopathology in our sample. As such, we were unable to examine the influences of psychiatric disorders and comorbidities in association with social exclusion, acquired capability, and self-aggressive behaviors. There is evidence to suggest that pain perceptions differ across various psychiatric conditions (e.g., increased in anxiety, decreased in borderline personality disorder; Lautenbacher & Krieg, 1994; Russ et al., 1992; Tang & Gibson, 2005); although college student samples generally experience less psychopathology than clinical samples, this possibility should be taken into consideration and explored in future research. Similarly,

perceptions of social exclusion may be exacerbated in individuals with major depressive disorder, social anxiety disorder, and other psychiatric conditions (Leary, 1990), highlighting the importance of replicating and extending these findings in samples of psychiatric patients.

Despite these limitations, these findings advance our understanding of intentional self-injurious behavior. Specifically, the present study provides evidence that social exclusion (thwarted belongingness) can interact with acquired capability within the relatively short time span of a laboratory task to increase self-aggressive behaviors. These findings suggest that risk for self-aggressive behavior is dynamic and can rapidly change with the introduction of new stressors. Given the absence of theory-based laboratory studies of self-injurious behaviors, this study is an important step in providing initial experimental evidence for facets of the interpersonal theory of suicide. Future research should continue to conduct theory-based experimental investigations of suicidal behavior to further elucidate causal mechanisms to then target through intervention and treatment.

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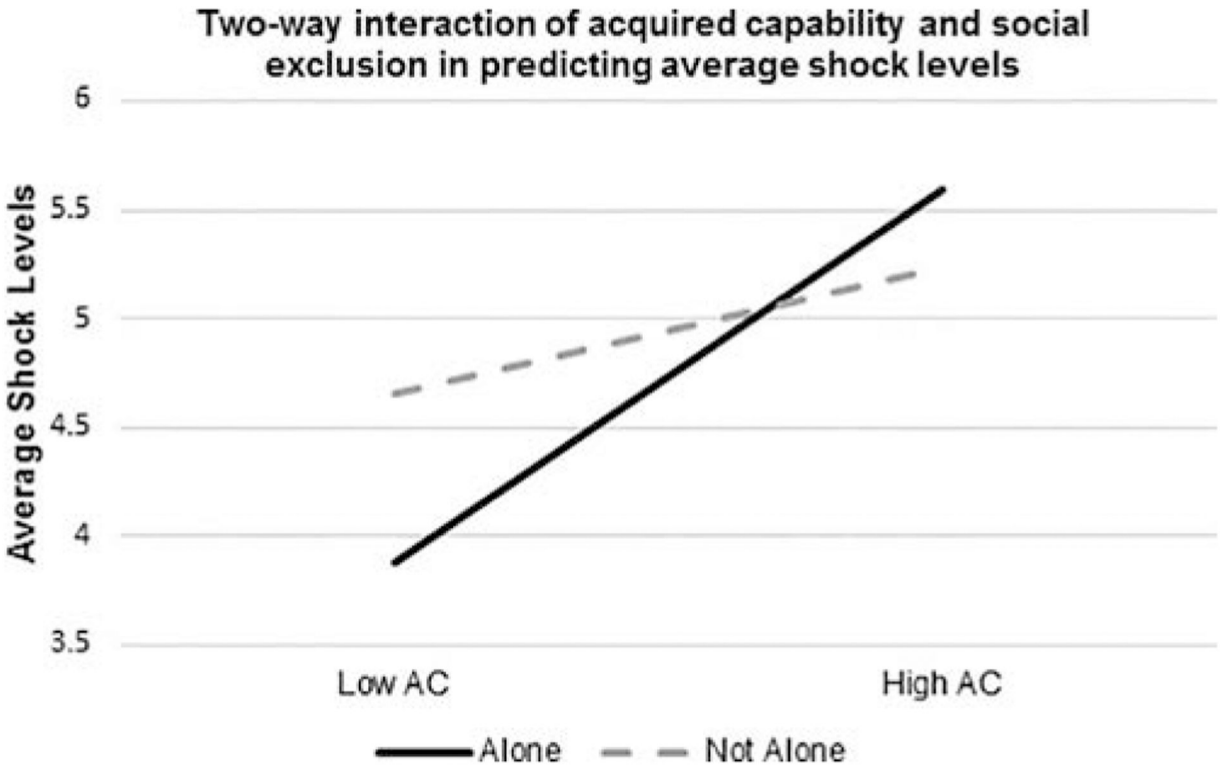

FIGURE 1.
Two-way interaction of acquired capability and social exclusion condition in predicting average shock levels.

TABLE 1.

Means, Standard Deviations, Ranges, and Bivariate Correlations of All Study Variables

Variable	1	2	3	4	5	6
1. Age	1					
2. Gender	−.36***	1				
3. Neuroticism	.02	−.20**	1			
4. ACSS	.15*	−.49***	.31***	1		
5. Condition	−.10	−.02	−.03	−.09	1	
6. Self-Aggression	.08	−.34***	.03	.21**	−.07	1
Mean	18.96	1.67	5.12	44.56	.34	4.85
SD	1.47	.47	1.26	12.08	.47	2.23
Range	18–30	1–2	1.5–7	18–80	0–1	1.5–9.5

Note.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Gender: 1 = Male, 2 = Female; ACSS = Acquired Capability for Suicide Scale; Condition: 0 = Not Alone; 1 = Alone. Higher scores for Neuroticism reflect lower neuroticism. Correlations between categorical (gender, condition) and continuous (age, neuroticism, acquired capability, self-aggression) are point-biserial correlations. Associations between categorical variables are Phi coefficients.

TABLE 2.

Multiple Regression Analysis Examining the Interaction Between Acquired Capability and Condition in Predicting Self-Aggression

Predictor	B	SE	β	t	sr2	95% CI
Handedness	−.51	.78	−.04	−.66	.00	−2.06, 1.03
Neuroticism	−.08	.11	−.05	−.73	.00	−.31, .14
Acquired Capability	.02	.02	.13	1.65	.01	−.01, .05
Condition	−.21	.29	−.04	−.72	.00	−.78, .37
Acquired Capability × Condition	.05	.02	.15*	1.98*	.01	.00, .09

Note.

*$p < .05$, sr2 = Semi-partial r squared effect size, 95% CI = 95% confidence interval; Condition: Alone = 1, Not Alone = 0.