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Replenishing connectedness: Reminders of social activity reduce aggression after social exclusion

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Previous research found that social rejection leads to increased aggression. How can this aggressive behaviour be prevented? Four experiments demonstrate that reminders of social activity reduce aggression after social exclusion. A brief, friendly social connection with an experimenter (versus a neutral interaction) reduced aggression after social rejection. A traditional mood induction had no effect on aggressive behaviour, showing that an activity must be social to be effective. Participants who wrote about a family member, a friend or a favourite celebrity were also not aggressive after rejection. The effect was mediated by trust in other people but not by state self-esteem or mood. Rejected participants who have an alternative source of social connection eschew the increased aggression usually displayed after social exclusion.

Many incidents of violence can be traced to social rejections. Romantic break-ups, exclusion by peers and being fired from a job all serve as common triggers for aggression. For example, almost all of the perpetrators of the school shootings in the USA experienced repeated rejection by their peers (Leary, Kowalski, Smith, & Phillips, 2003). The US Surgeon General's Report on Youth Violence (2001) found that social exclusion (operationalized as 'weak social ties') was the strongest risk factor for adolescent violence, more predictive than gang membership, poverty or drug use. In addition, laboratory experiments have shown that social rejection causes increased aggression, sometimes even against people unrelated to the rejection (Buckley, Winkel, & Leary, 2004; Kirkpatrick, Waugh, Valencia, & Webster, 2002; Twenge, Baumeister, Tice, & Stucke, 2001). Thus, in both laboratory and real-world situations, social rejection often leads to aggression and violence (for a review, see Leary, Twenge, & Quinlivan, 2006).

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Given that aggression is a costly and socially undesirable consequence of social exclusion, it may be desirable to investigate possible ways of removing or reducing that consequence, especially if the eventual result could be a net reduction in interpersonal violence. The present set of experiments examined two hypotheses about how to prevent rejection from causing aggression. The first was to replenish feelings of social connection. As the need to belong is a fundamental human motivation, and rejection or exclusion thwarts that need, rejected people should be especially motivated to re-establish belongingness (with the same or new partners). An offer of friendship or other positive social connection should be very appealing to recently rejected individuals, and this might presumably take precedence over any antisocial or aggressive tendencies. Thus, an opportunity to form or replenish social bonds could attenuate aggression by rejected people. The second hypothesis involved positive mood. There is ample theoretical basis for predicting that pleasant emotions and positive moods would reduce or prevent aggression, perhaps especially among people who have recently undergone a threatening or upsetting experience such as being rejected. The next sections will explain the basis and derivation for these hypotheses.

Belongingness theory and research

The motivational theory of belongingness suggests that replenishing social connections should eliminate many of the negative effects of rejection. According to Baumeister and Leary (1995), people are motivated to get and sustain at least a certain level of social connectedness. If social rejection causes people to feel they do not have sufficient connections, they would be expected to seek or cultivate new partners and bonds or to strengthen weak social ties. Some evidence fits this view. For example, female (though not male) participants who had been ostracized proceeded to try harder on a subsequent group task (Williams & Sommer, 1997), possibly as a strategy for making themselves more attractive to the new group. Gardner, Pickett, and Brewer (2000) found that people who were excluded subsequently paid more attention to the social aspects of a diary, presumably because exclusion made interpersonal information more salient to a current need.

If rejected people desire and seek better interpersonal connections, however, why do rejected people strike out aggressively towards others, as previous studies have repeatedly found (e.g. Twenge *et al.*, 2001)? Aggression would seem exactly the opposite of a logical, adaptive, motivational response to rejection, which would be to act prosocially in order to make friends and replenish social connections. A possible explanation for the aggression found in previous studies is that the structure of the situation did not allow participants to re-establish social connections. The targets of the aggression in the previous experiments (e.g. Twenge *et al.*, 2001) were anonymous, temporary and unconnected with any other group. Participants did not expect to interact with their opponents again or even meet them face-to-face. In that sense, they were not promising candidates for friendly social connection. In addition, participants happened upon them immediately following the rejection. Rejected participants did not have time to recall previous experiences of social acceptance or to actively remember that they had important social connections to other people outside the laboratory situation. Overall, participants in the previous experiments did not have the opportunity to replenish social connections, the action expected by the motivational theory.

One finding provides some tentative support for the idea that the aggressive response to rejection depended in part on seeing no prospect for making a positive social connection with the potential target of aggression. In Experiment 3 of Twenge *et al.* (2001), participants experienced a social exclusion manipulation and then received feedback on an essay they had written. Excluded participants who received negative feedback behaved aggressively by giving a critical job evaluation to their interaction partner. In contrast, excluded participants who received praise were not any more aggressive towards the interaction partner who had praised them than the control groups. Thus, excluded people did not strike out at a friendly partner. This experiment demonstrates that excluded participants are not aggressive across absolutely all situations, and moreover, that some friendly treatment could prevent the aggressive response.

On that basis, we hypothesized that if excluded participants are given the chance to replenish their social connections, then they are likely to seize this opportunity and therefore might not be aggressive. If we invoke the metaphor of belongingness as a fuel tank (e.g. Leary, Tambor, Terdal, & Downs, 1995), rejection empties the tank of fuel. This lack of fuel causes the car to malfunction, leading to negative behaviour like aggression. Once participants use current or remembered social connection to refuel the tank of belongingness, the car will function normally and aggression will not occur.

The role of mood

Improving mood is another possibility for reducing aggression. Mood could eliminate aggression on its own; alternatively, it could mediate the effect of social connection on aggression, as social connection might improve mood. Our previous research found that social exclusion did not affect mood across three different self-report measures and did not mediate the effects on behaviour (e.g. Twenge *et al.*, 2001; Twenge, Catanese, & Baumeister, 2003). Accepted and rejected participants did not even differ on a scale of mood adjectives specifically focused on anger (Twenge *et al.*, 2003). The only measure that yielded significant differences was a 1-item mood measure, and those differences were small. Moreover, even researchers who find that rejection or ostracism affects mood also find that mood does not mediate the relationships with behaviour (e.g. Buckley *et al.*, 2004; Williams, Cheung, & Choi, 2000). Implicit measures actually show increased positive affect following rejection (Twenge *et al.*, 2006). Rejected participants finished more word stems with positive emotion words and were more likely to group words by emotional valence (versus semantic meaning).

These recent results suggest that rejected people are attempting to regulate their mood. Moreover, there is some evidence that aggression can be an attempt at affect regulation, at least among people who believe that they will feel better after aggressing (Bushman, Baumeister, & Phillips, 2001). Hence, it is plausible that if one were to repair or improve the mood of a rejected person, that person's aggressive tendencies might be reduced or eliminated. Many activities that replenish the need to belong or involve friendly interaction might also improve mood.

In the experiments reported here, we addressed the possibility of mood repair in several ways. We measured mood between the exclusion manipulation and the aggression measure in three of the experiments. Those measures enabled us to determine the effect of social exclusion and friendly interaction on mood and address whether mood mediated their effect on aggression. We also performed an experiment that used a standard mood induction that did not involve social

connection, to see whether a non-social mood induction would affect aggression after social exclusion.

Overview

We hypothesized that friendly social connection, whether current or remembered, would eliminate aggression after social rejection. We also examined the effect of mood. In Experiment 1, some participants received thanks and a bag of candy from an experimenter; we predicted that this friendly social connection would eliminate aggression. Participants in Experiment 2 watched mood-inducing videotapes. We hypothesized that this task would not eliminate aggressive responses in excluded participants, because it did not involve social connection, but if mood repair alone were the driving connection between rejection and aggression, then the mood induction would be sufficient to eliminate aggression. In Experiment 3, participants experienced social exclusion and wrote about a recent meal, a celebrity or a family member. We predicted that writing about a social connection (the family member) would eliminate aggression after social exclusion. Experiment 4 replicated and extended Experiment 3; participants experienced a group rejection and wrote about a friend or their walk to campus. This experiment also measured trust in others and state self-esteem between the writing task and the aggression measure, allowing us to test for mediation by these variables.

EXPERIMENT 1: POSITIVE INTERACTION WITH AN EXPERIMENTER

This experiment provided a direct test of the hypothesis that friendly social connection would eliminate aggression after social rejection. We used a 2 (belongingness: rejection or acceptance) × 2 (social connection: positive or neutral) design.

Participants first experienced either acceptance or rejection by a group of peers. Groups of participants engaged in a structured conversation designed to help them get to know each other. After this, all participants were asked to name the people with whom they would most like to work in pairs. By random assignment, half the participants were told that no one had expressed an interest in working with them, which constituted a palpable and seemingly unanimous social rejection. The other half of the participants heard that everyone chose them, an experience of social acceptance.

Half of the participants then experienced a friendly social connection: the experimenter thanked them for participating and gave them a bag of candy (the other participants received only a written receipt for participation). We predicted that this friendly social connection would eliminate aggression after social rejection. This was an especially strong test of the hypothesis, as this interaction, though friendly, was very brief and involved a stranger whom the participants were unlikely to ever meet again. If this brief contact eliminates aggression after social rejection, it would be a robust demonstration of the effect of friendly interaction.

Method

Participants

Participants were 54 undergraduate students (34 female) from introductory psychology at Case Western Reserve University who took part to fulfil a course requirement. Data

from six participants were excluded: 4 for suspicion, 1 for not following instructions and 1 due to technical problems with the computer. This left 48 participants with useable data.

Procedure

Participants arrived at the laboratory in single-sex groups of three to five people. They were given nametags on which they wrote their first names. They were given both written and oral instructions to learn each other's names and then talk for about 15 minutes using a set of questions as a guide (the questions were taken from the relationship closeness induction task developed by Sedikides, Campbell, Reeder, & Elliot, 1999). After 15 minutes, the experimenter led the participants to separate rooms, where participants nominated the two group members they wanted to interact with again ('We are interested in forming groups in which the members like and respect each other. Below, please name the two people (out of those you met today) you would most like to work with'). Participants in groups of three nominated the one person they would like to work with. Instead of using these nominations, however, participants were randomly assigned to be accepted or rejected by the group. Accepted participants were told that everyone had picked them, and rejected participants heard that no one picked them. This procedure was adapted from Leary *et al.* (1995) and was used by Twenge *et al.* (2001, 2003).

Participants were then randomly assigned to experience either a friendly social connection or a neutral interaction with the experimenter. In the friendly social connection condition, the experimenter explained that, in addition to the credit they would be receiving for their participation, she also had a small gift for them to thank them for participating in this study. She then gave the participant a small bag of candy tied with a ribbon. In the neutral social connection condition, the experimenter gave the participant a receipt verifying that they would receive the credit they had been led to expect for their participation. The experimenter explained that they received their candy or credit sheets at this point because the first part of the study was finished. Only one of the participants opened the bag of candy during the experiment. This method has been used in several other experiments (e.g. Isen & Daubman, 1984; Nygren, Isen, Taylor, & Dulin, 1996). After receiving the social connection manipulation, all participants then completed the current mood version of Positive Affect and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988).

Participants then played a noise-blast game often used as a measure of aggression (e.g. Bushman & Baumeister, 1998; Bushman *et al.*, 2001; Taylor, 1967). Participants were told that they would play the computer game with a new person, someone who came late to the experiment who was not part of the earlier group (in actuality, the computer was programmed to mimic a person's responses). This person was always referred to as being the same gender as the participant. Participants were told that they would have to press a button as fast as possible on each trial; whoever lost the trial would hear a blast of white noise through the headphones attached to the computer. Each participant set in advance the noise that the other person would hear, including both the intensity (a level ranging from 0 to10) and the duration (controlled by holding down the mouse button to set the length of time that the other person would hear the noise). Thus, the participants were effectively given a weapon that could be used to aggress against their partner by blasting him or her with noise.

A Macintosh computer controlled the events in the reaction time task and recorded the participants' noise levels and noise durations. We recorded data from only the first noise setting, as we were interested in initial, unprovoked aggression. Previous research has shown that the first trial is the best measure of unprovoked aggression, because the participants have not yet received bursts of noise from their opponents; later trials are confounded by the broad tendency to reciprocate how the participant was treated by the opponent (see, e.g. Bushman & Baumeister, 1998). The two variables (intensity and duration) were converted to z scores and then summed to serve as a composite measure of aggression. Thus, negative scores indicate below-average aggression, and positive scores indicate above-average aggression, within the sample tested. After completing the game, participants were carefully debriefed to make sure they understood that the rejection feedback was not true and that they were actually competing with a programmed computer during the noise-blast game.

Results and discussion

Previous research consistently showed that social rejection caused aggression against neutral people (Kirkpatrick *et al.*, 2002; Twenge *et al.*, 2001). The results of this experiment show that a friendly social connection can considerably reduce aggression after social rejection (see Figure 1). In a 2 × 2 ANOVA, the interaction between belongingness condition and social connection condition was significant, $F(1, 44) = 7.88$, $p < .007$. The main effects for belongingness condition, $F(1, 44) = 1.99$, *ns*, and social connection condition, $F(1, 44) = 2.03$, *ns*, were not significant.

In the neutral interaction control group, where participants received only a written receipt, rejected participants were significantly more aggressive than accepted participants, $F(1, 44) = 8.92$, $p < .005$ in a planned comparison. However, among those who experienced a friendly social connection, rejected and accepted participants did not differ in their level of aggression, $F(1, 44) = 0.97$, *ns*, in a planned comparison. Rejected participants in the neutral condition were significantly more aggressive than those in the friendly interaction condition, $F(1, 44) = 9.34$, $p < .004$, in a planned comparison. Thus, a merely neutral social interaction (receiving a receipt) was not enough to eliminate aggression; the interaction had to be friendly to be effective.
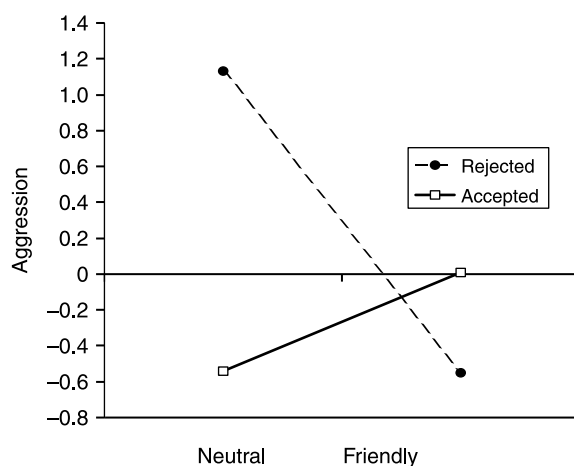

Figure 1. Rejection, friendly interaction, and aggression.

Mood effects might provide an alternate explanation for these results, if the friendly interaction improved mood. However, friendliness in the form of receiving thanks and candy did not affect mood. Neither belongingness condition nor receiving candy and thanks was a main effect in predicting negative mood on the PANAS scale, $F(1, 42) = 1.39$, *ns*; $F(1, 42) = 0.05$, *ns*, respectively, nor was there a significant interaction, $F(1, 42) = 1.69$, *ns*. The results were similar for positive mood: $F(1, 42) = 2.06$, $p = .16$ for belongingness condition, $F(1, 42) = 1.00$, *ns* for social connection condition and $F(1, 42) = 0.15$, *ns*, for the interaction. Neither belongingness condition nor social connection condition significantly affected participants' mood. These findings contradict the requirements for mediation. Thus, mood cannot explain the links between rejection, friendly interaction and aggression.

In summary, having a brief but friendly social connection reduced aggression after social rejection, and that result cannot be traced to mood. A neutral interaction was not enough to replenish belongingness, as receiving a written receipt from an experimenter did not eliminate aggression.

EXPERIMENT 2: NON-SOCIAL MOOD INDUCTION

Experiment 1 found that friendly interaction eliminated aggression after social rejection, without any mediation by mood. Although participants did not report significant mood changes from receiving thanks and candy from an experimenter, it is still possible that this experience affected mood. We conducted Experiment 2 as a further test of mood as an alternative explanation. This experiment was designed to test directly whether improved mood, independent of a social connection, would eliminate aggression following social rejection.

In this experiment, participants first experienced a social exclusion manipulation (previously used in several other experiments, e.g. Twenge *et al.*, 2003). In the crucial 'future alone' condition, they were told that they were likely to end up alone later in life. In a control condition, participants heard that they would be accident prone later in life, which is a negative outcome unrelated to social exclusion (future misfortune). Another control group received no future prediction (no feedback). In previous research, this manipulation has consistently produced results very similar to the group rejection manipulation; both led to increases in aggression and decreases in self-control, and the effect sizes were similar (Baumeister, DeWall, Ciarocco, & Twenge, 2005; Twenge *et al.*, 2001).

Participants were then exposed to a standard mood induction: watching videotapes designed to induce specific mood states (Gross & Levenson, 1995; Hemenover, 2003; Muraven, Tice, & Baumeister, 1998). Although the tapes involve scenes with people, participants have no social connection or interaction with them. Because this experience does not involve social connection, it will show whether a mood induction alone is enough to eliminate aggression after social rejection.

Experiment 2 was a 3 (social exclusion: future alone, future misfortune control, no feedback control) × 3 (mood-inducing videotapes: happy/positive, sad/negative, neutral) design. We hypothesized that friendly social connection – rather than the potential mood-inducing qualities of such interactions – eliminates the aggression that typically follows social rejection. Consistent with this hypothesis, we predicted that the mood-inducing videotapes would not successfully attenuate aggressive responses following social exclusion.

Method

Participants

Participants were 94 undergraduate students (69 female) from introductory psychology at San Diego State University who took part to fulfil a course requirement. They were 59% white and 41% racial minority, and their average age was 18.5 years.

Procedure

Participants were run individually. They first completed the Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1975). Participants were randomly assigned to one of three social exclusion conditions: future alone, future misfortune or no feedback. To gain credibility, the experimenter first gave an accurate assessment of the participant's extraversion score, providing correct feedback about whether the score was high, medium or low on this scale. The experimenter used this as a segue into reading a randomly assigned 'personality type' description. In the future alone condition, the participant was told: 'You're the type who will end up alone later in life. You may have friends and relationships now, but by your mid-20 s, 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 new relationships, the odds are you'll end up being alone more and more'. People in the future misfortune condition were told that: 'You're likely to be accident prone later in life – you might break an arm or a leg a few times, or maybe be injured in car accidents. Even if you haven't been accident prone before, these things will show up later in life, and the odds are you will have a lot of accidents'. This condition was intended to describe a negative outcome that was not connected with relationships or social exclusion. A third group did not receive any feedback about their future.

After receiving the social exclusion manipulation, participants were randomly assigned to watch one of three mood-inducing videotapes: a happy tape (Robin Williams performing stand-up comedy), a neutral tape (an informational video about bighorn sheep) or a sad tape (a scene from the movie *Terms of Endearment*, which shows a dying woman saying goodbye to her children, husband and mother). All of the tapes were approximately 10 minutes long. Participants were then instructed to rate their current mood by completing the PANAS. They then played the noise-blast aggression game with another participant. Aggression was once again measured using the white noise aggression game described in Experiment 1, with noise intensity and noise duration from the first turn converted to z scores and then summed. After they finished the game, participants were carefully debriefed to make sure they understood that the future prediction was not true and that they competed against a programmed computer and not another participant.

Results and discussion

This experiment tested whether a standard mood induction would affect aggression after social exclusion. The results show clearly that it did not: in a 3×3 ANOVA, there was no main effect for mood-inducing videotape seen on aggression, $F(2, 85) = 0.16$, *ns*, and no interaction between mood-inducing videotape and social exclusion conditions, $F(4, 85) = 0.14$, *ns*. However, there was a main effect for social exclusion on aggression, $F(2, 85) = 15.10, p < .004$. Participants who heard that they were likely

to be alone later in life ($M = 0.75$, $SD = 2.01$) were significantly more aggressive than those who heard nothing ($M = -0.21$, $SD = 1.45$) or heard that they would be accident-prone ($M = -0.58$, $SD = 1.00$). The future alone group was significantly different from the other two at $p < .05$ in a Tukey HSD *post hoc* test.

The mood-inducing videotapes affected self-reports of negative mood on the PANAS. Participants who watched the sad tape ($M = 15.94$, $SD = 4.23$) reported being in a significantly more negative mood than those who watched the neutral tape ($M = 13.73$, $SD = 3.66$) or the happy tape ($M = 12.52$, $SD = 2.36$), $F(2, 85) = 7.41$, $p < .001$ in the full model. Tukey HSD *post hoc* tests showed that the sad tape group felt significantly worse from the other two at $p < .05$. In that sense, the induction of negative mood was clearly effective. Negative mood did not differ among exclusion conditions, $F(2, 85) = 0.51$, *ns*, nor was there a significant interaction between exclusion and videotape, $F(4, 85) = 4.94$, *ns*. The videotapes did not affect self-reports of positive mood, $F(2, 91) = 0.81$, *ns*.

In addition, negative mood cannot explain the correlation between exclusion and aggression. Negative mood was not correlated with aggression, $r(94) = -.10$, *ns*, and the correlation between exclusion condition (coded as dichotomous) and aggression was still highly significant after being controlled for negative mood, $r(90) = .33$, $p < .001$. Thus, negative mood did not mediate the relationship between exclusion and aggression.

In short, and consistent with our predictions, a standard, non-social mood induction had no effect on aggression after social exclusion. This is important because viewing the videotapes was purely a mood manipulation and did not involve a friendly social connection. Whereas receiving thanks and candy from an experimenter reduced aggression after social rejection, watching an emotion-laden videotape did not. These results provide additional support that it is not the mood-inducing qualities of real or remembered friendly social connection that diminish aggression after exclusion. Instead, it is the friendly social connection itself that is responsible.

EXPERIMENT 3: WRITING ABOUT A FAMILY MEMBER OR CELEBRITY

Experiment 1 showed that a brief, friendly interaction with the experimenter reduced aggression after rejection. In this experiment, we tested whether recalled social connection would have the same effect. We also sought to establish the boundary conditions for friendly social connection: how close must a relationship be for its recall to affect aggressive behaviour?

This experiment used the future prediction social exclusion manipulation used in Experiment 2, which includes the future misfortune control group. Thus, it extends the findings of Experiment 1 by adding a negative-outcome, non-social control condition; if the findings are similar to Experiment 1, this would demonstrate that rejection (rather than acceptance) is causing the effects. Immediately after the manipulation, participants wrote for 2 minutes on one of three topics: their favourite family member, their favourite celebrity or their most recent meal (a control group). This method was modified from Gardner (2001). This created a 2 (social exclusion: future alone, future misfortune) × 3 (writing task: family member, celebrity, control) design.

We predicted that writing about a favourite family member would eliminate aggression after social exclusion. This task should remind excluded participants that they have people who care about them, thereby replenishing their feeling of social connection. We also predicted that writing about a favourite celebrity would reduce

aggression. Participants are likely to choose someone they admire and have thought about. Participants may feel a social connection with their favourite celebrity even if they have not actually met this person (known as a parasocial or ersatz social relationship; e.g. Giles, 2002; Green & Brock, 1998). If writing about a celebrity eliminates aggression after exclusion, this will be especially strong proof that recalling social connections can affect behaviour after social exclusion. However, it is also very possible that writing about a celebrity will not have this effect. Gardner (2001) found that celebrities did not fulfil belongingness needs, and writing about celebrities might not remind participants of meaningful social connections in the same way that writing about a family member will.

We expected mood findings consistent with the null results of Experiments 1 and 2. We predicted that mood would not be able to explain any effects of recalling social bonds on aggressive responses.

Method

Participants

Participants were 113 undergraduate students (61 male, 52 female) from introductory psychology at San Diego State University who took part to fulfil a course requirement. They were 43% white and 57% racial minority, and their average age was 19.2 years.

Procedure

Participants experienced the same exclusion manipulation as in Experiment 2, except we used only the future alone and future misfortune groups. After hearing the future feedback, participants were asked to write for 2 minutes according to one of three sets of instructions. Participants randomly assigned to the control condition read instructions to 'Take a moment to think of what you ate at your most recent meal (breakfast or lunch). Below, write a brief description of this meal'. Participants in the celebrity condition were instructed to 'Take a moment to think of your favourite celebrity. Think about this person and why you like him/her. Below, write a brief description of this person'. Participants in the family condition were instructed to 'Take a moment to think of your favourite family member. Think about this person and why you like him/her. Below, write a brief description of this person'.

After the writing task, participants completed the PANAS with instructions to rate their current mood. They then played the noise-blasting game, our usual measure of aggression, ostensibly with another participant. After finishing the game, participants were carefully debriefed to make sure they understood that the future prediction was not true and the game was staged.

Results and discussion

The results showed that writing about either a celebrity or a family member reduced aggression after social exclusion. A 2×3 ANOVA revealed a significant interaction between social exclusion and writing task, $F(2, 107) = 4.23$, $p < .02$ (see Figure 2). The main effects for exclusion, $F(1, 107) = 1.09$, *ns*, and writing task, $F(2, 107) = 0.31$, *ns*, were not significant.

Among participants who wrote about a recent meal (the control condition), socially excluded participants were, as usual, more aggressive than those who heard they would
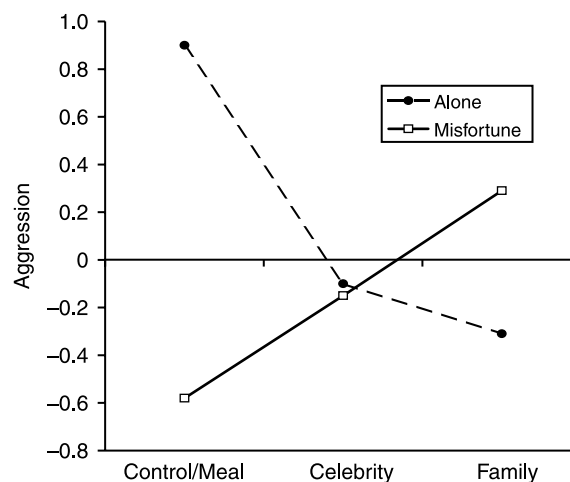
Figure 2. Exclusion, writing task, and aggression.

be accident prone, $F(1, 107) = 7.67$, $p < .01$, in a planned comparison. However, social exclusion did not cause aggressive behaviour when participants wrote about a celebrity, $F(1, 107) = 0.01$, *ns*, or a family member, $F(1, 107) = 1.51$, *ns*. Socially excluded participants who wrote about a meal were significantly more aggressive than those who wrote about a family member, $F(1, 107) = 5.59$, $p < .01$, and were marginally more aggressive than excluded participants who wrote about a celebrity, $F(1, 107) = 3.73$, $p = .07$. However, the writing task did not affect the aggressive behaviour of those who heard they were likely to be accident prone. Future misfortune participants who wrote about a meal did not significantly differ from those who wrote about a family member, $F(1, 107) = 2.86$, *ns*, or about a celebrity, $F(1, 107) = 0.70$, *ns*. Thus, recalling a social connection, even as tenuous a connection as that with a celebrity, reduced aggression after social exclusion.

Participants who wrote about a celebrity uniformly chose people whom they liked and admired. They often wrote specific descriptions of their chosen celebrity, sometimes mentioning how similar the celebrity is to them. One participant chose *American Idol* winner Kelly Clarkson, writing, 'I like her a lot because she sings very well. I too sing very well so I can relate to her'. Another said she liked Cameron Diaz because 'I've read interviews with her and she likes to be "one of the guys", which I think is good of her to admit'. A third participant chose Michael Jordan and wrote, 'I like him because he is very motivated'. and another wrote that Jessica Alba 'acts like an average person. She is sometimes shy, but when talked to, is talkative like me'. Such writing suggests that participants felt a friendly social connection (a parasocial relationship) with the celebrities they chose.

Consistent with our predictions, the reduction in aggression was not due to mood. In fact, it apparently occurred despite mood effects. Participants who wrote about a favourite celebrity ($M = 15.05$, $SD = 5.35$) reported a significantly more negative moods, compared with those who wrote about a meal ($M = 12.85$, $SD = 3.24$) or a family member ($M = 12.73$, $SD = 2.59$), $F(2, 110) = 4.27$, $p < .02$. Tukey HSD *post hoc* tests showed that the celebrity group's negative mood score was significantly higher than the other two groups' at $p < .05$. Perhaps the upward social comparison involved in thinking about a celebrity was enough to induce a

negative mood. However, it was not enough to cause aggression, even when combined with exclusion feedback.

Social exclusion had no effect on negative mood scores $F(1, 107) = 0.15$, ns, and positive mood did not differ as a function of either social exclusion, $F(1, 107) = 0.18$, ns, or writing task $F(2, 107) = 0.65$, ns. In addition, mood did not mediate any of the effects. Mood was not correlated with aggression, $r(111) = .04$ for positive mood, and $r(111) = .06$ for negative mood. In addition, the significant correlation between exclusion and aggression in the meal control group, $r(32) = .48$, $p < .004$, did not change when we controlled for negative mood, $r(31) = .48$, $p < .005$, positive mood $r(31) = .52$, $p < .002$, or both $r(30) = .52$, $p < .002$. These findings strike a new and even more formidable blow against the hypothesis that improving mood is essential to overcoming the aggressive response to rejection: Writing about a celebrity eliminated aggression after exclusion, even though this task led to increased negative mood.

Gardner (2001), whose method we modified, found that bringing a picture of a friend assuaged the effects of social exclusion, whereas bringing a picture of a celebrity did not. Why did our results differ? First, we asked participants to write about their favourite family member or celebrity, and thus someone whom they liked and with whom they identified. In Gardner's experiment, participants may have chosen the celebrity on the basis of criteria unrelated to a sense of connection. For example, they may have selected a celebrity whose picture was easy to find. In addition, participants in our study chose their celebrity or family member after the exclusion experience. In Gardner's method, the picture was chosen before participants arrived at the laboratory. Thus, our participants might have chosen someone who would fulfil a social connection after they experienced social exclusion.

EXPERIMENT 4

We designed Experiment 4 to replicate and extend the results of the three previous experiments. To increase generalizability, we used a different rejection manipulation and a different writing task than in Experiment 3. Here, participants experienced rejection or acceptance from a group using the same manipulation used in Experiment 1. They then wrote for 2 minutes either about the best friend they ever had or about their travel to campus (the control condition). Writing about a friend, similar to writing about a family member as in the previous experiment, should serve to replenish feelings of belonging. Thus, this study used a 2 (rejection versus acceptance) × 2 (friend versus control) design.

A further goal of Experiment 4 was to test two potential mediators of the effect of social exclusion on aggression. These were trust and self-esteem. Trust forms the basis for many human interactions, and indeed some forms of interpersonal connection, from marriage to economic exchange, are almost inconceivable without trust. It is plausible that one effect of social exclusion is to undermine trust. A recent investigation by Baumeister *et al.* (2005) showed that social exclusion undermines self-regulation and tentatively concluded that the most apt explanation is an implicit bargain between the individual and his or her social circle. The person puts forth the effort and sacrifice required for self-regulation (thus altering behaviour to meet social standards and others' expectations, instead of doing what one wants) and receives the benefits of social belongingness in return. Social exclusion violates that implicit bargain and signifies that one cannot trust that one's efforts will be rewarded with belongingness. As a result, the person loses the will to make the effort and sacrifices required for effective

self-regulation. Although that investigation did not explicitly measure trust, the pattern suggests that much social behaviour is predicated on the trust of receiving social rewards – and that social exclusion undermines that trust. Applied to the present findings, that line of reasoning would suggest that recalling a positive social bond or having a mutually satisfying interaction could help restore the person's trust that social acceptance in general is still available, despite the recent single experience of being rejected. Trust may be especially relevant to the noise-blast aggression measure we used, because people who trust the game opponent to restrain his or her aggressive impulses may be most likely to restrain their own aggressive impulses, whereas those who expect the worst from others (low trust) may behave more aggressively themselves.

State self-esteem might also mediate the effects of rejection and reconnection. A long tradition of psychological theorizing has assumed that some aggression stems from low self-esteem or, more recently, from threats to self-esteem (see Baumeister, Smart, & Boden, 1996), and recent work has also suggested that self-esteem rises and falls with social connection (Leary *et al.*, 1995). MacDonald, Saltzman, and Leary (2003) found that self-esteem was most influenced by domains that participants believed were relevant for social approval. Thus, exclusion might conceivably constitute a threat or blow to self-esteem, which could lead to aggressive responding. Meanwhile, a brief experience or fond memory of social connection could plausibly boost self-esteem, thereby perhaps preventing the aggressive response.

Thus, after the writing task participants completed a brief questionnaire with items measuring trust and state self-esteem. Participants then played the noise-blasting game with a new partner.

We expected that rejected participants who wrote about a friend would be less aggressive than those who did the control writing task, replicating and extending the results of Experiment 3. If the friend task replenished connections, we expected that these participants would show higher levels of trust and state self-esteem. We hypothesized that trust and self-esteem would mediate the link between writing task and aggression among rejected participants.

Method

Participants were 81 undergraduates (59 women) from introductory psychology at San Diego State University who partook to fulfil a course requirement. They were 54% white and 46% racial minority; average age was 20.3. Of the participants, 3 were eliminated; 2 for suspicion about the experimental procedure and 1 for misidentifying how many people chose her. Thus, there were originally 84 participants.

Participants met in single-sex groups of four to six people and heard that either no one or everyone picked them, identical to the procedure in Experiment 1. Half of the participants were asked to write for 2 minutes on a page with the prompt, 'Take a moment to think of the best friend you ever had. Think about this person and why you like him/her. Below, write a brief description of this person'. The other half received the prompt, 'Take a moment to think of how you got to campus today. Think about how you travelled to get here. Below, write a brief description of how you got here'.

Participants then completed a questionnaire with two items measuring trust ('most people are basically honest', 'most people can be trusted') and four items from the State self-esteem scale (Heatherton & Polivy, 1991). Both of these scales were internally reliable (α for trust items $= .82$; α for state self-esteem items $= .67$). Participants then played the noise-blasting game with a new person, who

was described as someone who came late and thus was not part of the original group. In a post-experimental questionnaire, participants were asked how many people chose them; all but one answered correctly (this one participant was eliminated; see above). As a manipulation check, participants were also asked how this made them feel on a scale from $1 = $ *rejected* to $9 = $ *accepted*. These responses confirmed the effectiveness of the manipulation. The main effect for rejection condition was highly significant, $F(3, 77) = 121.19$, $p < .001$, with no main effect for writing task and no interaction.

Results

As predicted, writing about a best friend reduced the heightened aggression of rejected participants. There was a significant interaction between rejection/acceptance and writing task on aggressive behaviour, $F(3, 77) = 11.21$, $p < .001$. There was a marginal main effect for rejection/acceptance, $F(3, 77) = 3.80$, $p < .06$, and no main effect for writing task, $F(3, 77) = 2.73$, *ns*. As Figure 3 shows, rejected participants in the control writing condition were the most aggressive, whereas rejected participants who wrote about a friend were no more aggressive than accepted participants. Rejected participants who completed the control writing task were significantly more aggressive than the other three conditions in a series of planned contrasts: $F(3, 77) = 13.73$, $p < .001$, compared with rejected participants writing about a friend, $F(3, 77) = 14.86$, $p < .001$ compared with accepted participants completing the control writing task, and $F(3, 77) = 5.66$, $p < .01$, compared with accepted participants who wrote about a friend. As expected, there were no significant differences among the other conditions.

   Trust was also significantly different among the conditions. The interaction between rejection/acceptance and writing task in predicting trust was significant, $F(3, 77) = 6.83$, $p = .01$. There was a significant effect for writing task, $F(3, 77) = 5.32$, $p < .03$, and no main effect for rejection condition, $F(3, 77) = 0.02$, *ns*. Rejected participants who wrote about a friend ($M = 9.45$) were significantly more trusting than rejected participants who completed the control writing task ($M = 6.77$), $F(3, 77) = 13.30$, $p < .001$, in a planned contrast. There were no significant differences among the other conditions.
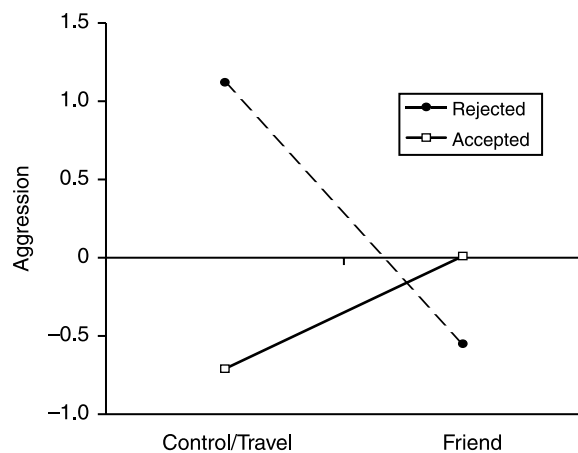

Figure 3. Rejection, writing task, and aggression.

We tested for mediation using Baron and Kenny's (1986) criteria. When the interaction term (rejection/acceptance multiplied by writing task, both centred) and trust were entered into a multiple regression predicting aggression, trust was a significant predictor, $\beta = -0.25$, $p < .03$. The interaction term was marginally significant, $\beta = -0.20$, $p = .07$. The results were similar and stronger when examined only among rejected participants, where the bivariate correlation between writing task and aggression was $r(37) = -.46$, $p < .002$, and the bivariate correlation between trust and aggression was $r(37) = -.48$, $p < .001$. When writing task and trust were entered into a multiple regression predicting aggression among rejected participants, trust remained a significant predictor, $\beta = -0.32$, $p < .05$, and writing task was again marginally significant, $\beta = -0.29$, $p = .07$. A Sobel test among rejected participants confirmed that trust mediated the link between writing task and aggression, $Z = 2.65$, $p < .01$. Writing about a friend reduces the usual aggression seen after rejection, and increasing participants' trust in others is at least one of the reasons.

For state self-esteem, the interaction between rejection/acceptance and writing task was also significant, $F(3, 77) = 5.94$, $p < .02$, with no main effects for either rejection/acceptance, $F(3, 77) = 0.06$, *ns*, or writing task, $F(3, 77) = 1.42$, *ns*. However, the conditions were not significantly different from each other in planned contrasts. Among accepted participants, those who wrote about a friend reported somewhat higher state self-esteem ($M = 22.70$) than those who completed the control writing task ($M = 20.05$) – a logical outcome (although a planned contrast was not significant). Among rejected participants, however, the opposite relationship emerged: those who wrote about a friend actually scored lower on state self-esteem ($M = 19.12$) compared with those who did the control writing task ($M = 21.27$), though again the planned contrast was not significant. Thus, rejected friend participants resembled accepted control participants; both groups had experienced one social connection boost and not another. In contrast, rejected control participants, who had a blow to social connections and nothing to make up for it, claimed somewhat higher self-esteem. Previous research suggests that rejected people engage in mood boosting (Twenge *et al.*, 2006); here, it appears that rejected people who did the control writing task exaggerated their self-feelings, whereas rejected people who wrote about a friend did not feel as strong a need to engage in defensive boosting of self-feelings.

State self-esteem was not correlated with aggression within rejected participants, $r(37) = -.01$, *ns*. Thus, it is not a mediator of the effect. This suggests that feelings of self-worth do not explain why social connections attenuate aggression after rejection.

GENERAL DISCUSSION

Aggression and violence constitute socially undesirable behaviours that impair the smooth, harmonious functioning of society and inflict pain and suffering on millions of individuals. Although for decades, social psychology has studied the factors that cause or increase aggression, authors such as Baron and Richardson (1994) have pointed out that showing how to reduce and prevent aggression would have greater practical utility for benefiting society than studying how to increase it. The question of how to reduce aggression can be independent of how to start it.

The present investigation began with fact that aggression is sometimes high among people who have been rejected. This has been established by now both in the

laboratory (Buckley *et al.*, 2004; Kirkpatrick *et al.*, 2002; Twenge *et al.*, 2001) and outside it in criminal violence (Leary *et al.*, 2003; US Surgeon General, 2001; for a review, see Leary *et al.*, 2006). Our goal was to find some potential means to counteract that effect and reduce the aggression.

Across the present series of experiments, we both replicated and eliminated the aggressive response to social exclusion. That is, we consistently replicated the finding that rejected or excluded people became more aggressive, but that effect was eliminated by manipulations that evoked positive social connection. Our findings were consistent across two different manipulations of social exclusion: one manipulation involved immediate rejection by other participants in the experiment who were ostensibly choosing partners for the next task, and the other consisted of feedback predicting a lonesome, socially isolated life commencing some years in the future. Moreover, consistent with previous findings, the heightened aggression in each case was directed towards a new interaction partner rather than someone who had rejected or excluded the participant in the first place – indeed, the target of aggression had seemingly done nothing to provoke aggressive treatment and was, in that sense, a fully innocent bystander.

How, then, did we manage to blunt the impact of these manipulated social rejections and prevent aggression towards a neutral, innocent party? We found that writing about a positive social relationship had the desired effect. That is, writing about a family member (Experiment 3) or best friend (Experiment 4) reduced aggression by rejected people, bringing it down to roughly the same low level exhibited by participants who had not been rejected. Apparently, the brief exercise of thinking about a valued relationship partner was enough to counteract the impact of the current experience of social exclusion. If rejection thwarts the need to belong, then thinking about a valued relationship (even just for 2 minutes) seems to be one potentially useful and powerful way to remind people that they are not alone in the world and do have good social bonds.

Two other manipulations also succeeded in reducing aggression in the wake of social exclusion. One involved receiving an unexpected favour from the experimenter in the form of a gift of a bag of candy. This manipulation has been used in previous research to induce positive mood (e.g. Isen & Daubman, 1984), but mood was not responsible for the present effects. In this case, what apparently mattered was the positive, friendly social interaction that expressed that the experimenter was grateful to the participant, and valued and appreciated the participant for taking part in the study. Unlike the writing exercises, this manipulation did not invoke an ongoing, existing social bond, but it did perhaps suggest the possibility of such bonds in the future, as it seemingly offered tangible proof that the participant could be valued and appreciated by some others.

The other manipulation that prevented the aggressive response to rejection involved writing about a favourite celebrity. Many people come to feel that they have personal relationships with celebrities, especially by when they watch them on television regularly and identify with them. Our procedures facilitated the tendency to choose a celebrity who might encourage this (albeit illusory) feeling of social connection, especially as participants chose their celebrity after the manipulation of social exclusion. (It seems likely that writing about a celebrity would have had less effect if they had been instructed to choose someone other than their favourite celebrity, or had made the choice before the exclusion manipulation, or had been assigned to write about a familiar but more controversial and less lovable figure such as President Bush). Participants selected celebrities they admired and liked, often writing that they closely identified with these famous people.

It would hardly be surprising if we eliminated the effect of rejection on aggression by overturning the rejection, such as if we told participants that the forecast of a lonely future

had been mistaken, or if the group members who ostensibly had failed to nominate the participant as a desired interaction partner called to say 'we want you after all'. Apparently, however, the impact of rejection can be offset by interpersonal processes that fall far short of that, as long as they invoke some possible, positive connection to others. Thinking about a different, even past, relationship, or having a friendly interaction in which a stranger (the experimenter) who expresses gratitude and appreciation, or even just writing about an imaginary social bond with a well liked famous person was apparently enough. These results demonstrate that belongingness needs can be fulfilled in both direct and indirect ways.

The present results are especially compatible with a motivational theory, not least because they suggest that the need to belong can be satisfied in different ways, and so, in a sense, different relationships or partners can substitute for each other. In Experiment 1, for example, participants were rejected by Persons A, B and C, causing them to become more aggressive towards Person D, unless they had a pleasant interaction with Person E. Likewise, in Experiment 3, feedback that they would be generally alone in the distant future made people more aggressive towards a specific fellow student in the present, but this was offset by thinking about a favourite family member and the past and present aspects of that good relationship.

The present results also shed considerable light on the inner processes by which thoughts of possible social connection counteracted the impact of rejection. When we first began this line of work, we thought that emotion would prove to be a crucial mediator (which is why Experiment 1 used the gift manipulation, which past work has used as a positive mood induction), but that hypothesis was repeatedly disconfirmed. Experiment 2 explicitly induced differential moods (using emotionally evocative videos, thus without social interaction), and these failed to counteract the effect of rejection. In our other studies, we included mood and emotion measures, and these failed to mediate the study's main findings. The positive social interaction in Experiment 1 failed to induce positive mood. In Experiment 3, writing about a celebrity produced a significantly more negative mood than the control condition, but participants in that condition were less aggressive anyway, which is thus significantly in the opposite direction to the hypothesis that mood repair mediated the reduction of aggression.

The failure of mood to mediate the impact of our rejection manipulations was counter-intuitive, given the assumption that social exclusion or rejection thwarts a basic motivation and therefore ought to elicit emotional distress. However, evidence has been accumulating to indicate that social exclusion is often such a threatening experience that people respond with an involuntary, possibly defensive, response akin to physical shock (MacDonald & Leary, 2005). Rejected people become temporarily numb to both emotional and physical pain, and their cognitive processes constrict to focus narrowly on meaningless, unthreatening issues (Twenge *et al.*, 2003; DeWall & Baumeister, 2006). Apparently, then, the immediate response to many experiences of rejection is a kind of emotional shutdown, which is why emotional distress fails to show up on the self-report measures and fails to mediate the behavioural consequences of social exclusion. We have previously found that even measures of specific emotions (such as anger) do not differ after rejection (Twenge *et al.*, 2003), and even researchers who find mood differences have found that they do not mediate the behavioural effects (e.g. Buckley *et al.*, 2004). We have also found that even a measure of belongingness feelings does not mediate the link between rejection and decreased prosocial behaviour (Twenge, Baumeister, DeWall, Ciarocco, & Bartels, in press).

Upon recognizing that mood and emotion did not mediate the impact of our manipulations on aggression, we turned in Experiment 4 to other possible mediators. Self-esteem had a promising theoretical case and intuitively might have explained the effect in Experiment 1, in which hearing that the experimenter appreciated the participant's efforts led to a reduction in aggression. In Experiment 4, the manipulations did have some significant effects on state self-esteem, but some predicted effects were not significant and others were seemingly in the wrong direction. Moreover, and crucially, state self-esteem failed to correlate with aggression, and so it did not mediate the reduction of aggression by manipulated thoughts of a best friend. Although belonging needs and self-esteem needs might be related, their effects can clearly be separated.

Trust, in contrast, did mediate the link between rejection and aggression. More precisely, our 2-item measure assessing willingness to trust 'most people' responded to both the rejection and social recall manipulations and met the criteria for mediation. Participants who were rejected by the group but then wrote about a valued best friend scored higher on trust and were correspondingly less aggressive than the rejected participants who wrote about the neutral topic. Apparently, thinking about one's best friend was sufficient to restore one's willingness to trust people in general, even after that trust had been shaken by the rejection experience.

These results further confirm the view that the need to belong is a fundamental and powerful need. They suggest that what people want from others is, first and foremost, to be accepted and included. Rejection apparently promotes taking a dim view of other people generally, as indicated by the heightened tendency to behave aggressively towards new, seemingly innocent individuals who were not party to the rejection and who have done nothing to provoke or antagonize the person. Having a positive social interaction or even just reminiscing about a good social relationship can apparently restore one's positive outlook on other people, and that more trusting, positive attitude towards others in turn reduces the aggressive stance that the rejected person would otherwise show. Moreover, it is an uplifting tribute to the power of good relationships that simply thinking about one valued partner can change the way one thinks of other people generally – leading to a significant reduction in aggression.

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