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Reports

Superman to the rescue: Simulating physical invulnerability attenuates exclusion-related interpersonal biases

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ABSTRACT

People cope with social exclusion both by seeking reconnection with familiar individuals and by denigrating unfamiliar and disliked others. These reactions can be seen as adaptive responses in ancestral environments where ostracism exposed people to physical dangers and even death. To the extent that reactions to ostracism evolved to minimize exposure to danger, alleviating these foundational concerns with danger may lessen people's need to cope with exclusion. Three studies demonstrate how a novel physical invulnerability simulation lessens both positive and negative reactions to social exclusion. Study 1 found that simulating physical invulnerability lessened exclusion-triggered negative attitudes toward stigmatized groups, and demonstrated that perceived invulnerability to injury (vs. imperviousness to pain) accounted for this effect. Studies 2 and 3 focused on another facet of social bias by revealing that simulating physical invulnerability lessened rejected participants' desires for social connection.

Introduction

Superman's 1939 debut in the first self-titled superhero comic marked a high point in America's fascination with superheroes, but it is likely that people have long fantasized about acquiring superhuman powers. This fascination has fueled the publication of innumerable movies, books, TV shows for adults and children alike, and debates comparing the relative advantages and disadvantages of possessing a particular power over another. Whereas owning such powers in reality would certainly be a life-changing experience, it is possible that simply possessing superpowers in one's imagination can be enough to defeat some inner demons. For instance, to the extent that certain psychological concerns are grounded in the processing of physical threat, mentally simulating experiences of physical invulnerability—becoming Superman—may alleviate these concerns. In the current research, we consider how both negative and positive responses to one such concern, social exclusion, can be interrupted when superhero fantasies take flight.

The dangers of exclusion

Social life has always been an important defense against physical threats (e.g., predators; hostile coalitions). The creation and maintenance of social relationships—particularly those within coalitional contexts (Navarrete, Kurzban, Fessler, & Kirkpatrick, 2004)—offers a variety of adaptive benefits (Axelrod & Hamilton, 1981). Over evolutionary time and continuing today, group membership minimizes exposure to physical dangers (e.g., by forming coalitions for hunting or defense) and confers access to resources such as food and potential mating partners (e.g., Baumeister & Leary, 1995). If having social connections historically increased one's chances of survival, then the costs of losing these connections were likely severe. Indeed, ostracism threatens not only one's social well-being, but also one's physical safety (Ackerman, Huang, & Bargh, 2012; Baumeister & Leary, 1995; MacDonald & Leary, 2005).

To the extent that historically, "being socially excluded was often equivalent to death" (MacDonald & Leary, 2005, p. 203), people may have evolved mechanisms to guide their reactions following social slights. Research suggests that exclusion experiences are reliably associated with perceptual changes which increase the likelihood of social reconnection. For example, Rejected people are more likely to remember social events over non-social events (Gardner, Pickett, & Brewer, 2000) and attend to faces displaying signs of acceptance such as smiles (DeWall, Maner, & Rouby, 2009). Moreover, when judging smiling targets, rejected participants more accurately distinguish between genuine (Duchenne) and deceptive smiles (non-Duchenne; Bernstein, Young, Brown, Sacco, & Claypool, 2008).

Early-stage attention and perceptual processes are not the only phenomena which change in the wake of rejection experiences. Overt judgments and behaviors towards other people are affected in ways that facilitate social reconnection, particularly towards desirable interaction partners. Experiments reveal that rejected people tend to

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express increased desires to make new friends and interact with others (e.g., Maner, DeWall, Baumeister, & Schaller, 2007) and increasingly display prosocial nonverbal behaviors towards others (Lakin & Chartrand, 2003; Lakin, Chartrand, & Arkin, 2008).

Important boundary conditions to these reconnection attempts exist, however. People are not likely to return to the proverbial hand that beat them, and in fact are particular about whose hand they will turn to next. For example, those who are excluded seek reconnection with potentially positive interaction partners but not with their rejecters (Maner et al., 2007) and express preferences to work with partners who display genuine smiles over non-genuine smiles (Bernstein, Sacco, Brown, Young, & Claypool, 2009). Moreover, rejection elevates negative biases towards out-groups as compared to in-groups (Knowles & Gardner, 2008; Navarrete et al., 2004). And finally, individuals rejected by a member of their in-group will display more prosocial nonverbal behaviors towards another in-group member as compared to an out-group member (Lakin et al., 2008). Taken together, this research suggests that experiences of exclusion trigger a host of downstream changes to people's interpersonal perceptions and judgments which facilitate social reconnection.

Protection against rejection

The association between exclusion and physical danger leads to the prediction that cues to physical invulnerability (the elimination of danger) may influence the emergence of compensatory responses to exclusion. That is, if rejection triggers behavioral changes designed in part to prevent exposure to danger, then making one feel physically safe may attenuate responses to being rejected.

Indeed, research indicates that physiological experiences conveying protection are capable of shielding people from the psychological pain of social rejection. In clever studies, DeWall et al. (2010) found that acetaminophen (a pain suppressant) reduced negative affective responses to rejection and neural activity in brain regions associated with processing social and physical pain. This pharmacological intervention targeted the affective component of the exclusion experience. Another approach might be to directly address an underlying concern that is theoretically linked to exclusion—physical danger.

Apart from handing out suits of armor, however, it is rather difficult to change actual susceptibility to danger. Instead, the use of mental simulation may allow for changes in the perception of physical vulnerability. Mental simulation refers to the activation of mental representations through observation or imagination, thereby aiding in planning, anticipation and interpersonal empathy (Decety & Grezes, 2006; Goldman, 2006). Recent research suggests that simulating an action can trigger internal bodily states analogous to those stemming from actually performing the behavior. By imagining another person's actions, people can experience vicarious pain (Jackson, Metzoff, & Decety, 2005), self-control depletion (Ackerman, Goldstein, Shapiro, & Bargh, 2009), cognitive dissonance (Norton, Monin, Cooper, & Hogg, 2003), and goal completion (McCulloch, Fitzsimons, Chua, & Albarracin, 2011). Moreover, merely imagining oneself consuming food causes people to satiate to that food more quickly when they subsequently eat it (e.g., Morewedge, Huh, & Vosgerau, 2010).

Given this research, imagining that one is impervious to injury may be sufficient to induce feelings of physical safety. These simulations of invulnerability, then, have the potential to affect one's social reality. Put another way, if people's reactions to exclusion evolved to minimize exposure to danger, targeting the foundational concern of physical threat may interfere with the ways (both positive and negative) in which people cope with exclusion. If so, these findings would illuminate connections between mental processes designed to manage physical and social outcomes, demonstrate the power of mental simulation to have important cross-domain effects, and deepen our understanding about compensatory responses to social exclusion.

Current research

As mentioned earlier, when people are excluded, they compensate by exhibiting more negative attitudes toward out-groups (Noel, Wann, & Branscombe, 1995), heightened favoritism towards their own groups relative to out-groups (Knowles & Gardner, 2008), and increased prosocial behaviors towards in-group members, but not out-group members (Lakin et al., 2008).

The following studies used a novel imagination task to test whether these responses are interrupted by the mental experience of safety. Many people have fantasized about having superpowers, such as the ability to fly or to resist earthly forms of injury. We drew upon these common Superman fantasies to encourage simulations of physical invulnerability. Study 1 demonstrated that simulating physical invulnerability affects exclusion-triggered attitudes towards stigmatized groups. Additionally, we examined whether invulnerability to injury, as opposed to invulnerability to pain, accounts for decreases in prejudice towards stigmatized others. Studies 2 and 3 tested how imagining invulnerability affects people's desire for social connection with familiar others as a function of whether people are rejected or not.

Pretest

Forty-one mTurk participants completed a guided visualization task in which they imagined themselves acquiring a particular superpower. Participants in the invulnerability condition were asked to imagine the following scenario:

> "On a shopping trip, you wander into a strange store with no sign out front. Everything is dimly lit and the shopkeeper calls you by name even though you have never seen him before. He tells you to come close and he says to you in a weird voice 'I have decided to give you a gift. Tomorrow, you will wake to find that you have a super-power. It will be an amazing ability, but you must keep it absolutely secret. *If you purposely tell anyone or show off your power, you will lose it forever*.'"

They then read:

> "That night, you have a hard time sleeping, but when you wake, you find that you do indeed have a super-power. A glass falls on the floor and without meaning to you accidentally step on the broken glass. It doesn't hurt you at all though, and you realize that *you are completely invulnerable to physical harm*. Knives and bullets would bounce off you, fire won't burn your skin, a fall from a cliff wouldn't hurt at all. You don't have any other super-powers though (for example, no super-strength). Everything else is exactly the same as it was yesterday."

In the control condition, they read a similar passage, except they imagined being able to fly instead of being invulnerable (see Appendix A). Participants were then explicitly instructed that they did not have any other superpowers and they could not reveal their powers to anyone (to minimize self-presentation issues). To make the mental simulation more salient, they were also asked to write briefly about what it would feel like to have the superpower and how they would use it in their own lives.

Afterwards, participants provided their responses to the imagination task by reporting their mood (1 = *Negative*; 9 = *Positive*), how much they liked the superpower (1 = *Not at all; 9 = Extremely*), and how physically safe from injury they felt (1 = *Not at all; 9 = Extremely*). T-tests revealed that those who simulated physical invulnerability did indeed feel more safe from injury ($M = 7.35$, $SD = 2.37$) than flying-primed participants ($M = 5.86$, $SD = 1.65$), $t(39) = 5.53$, $p = .024$. There were no differences by condition for the other measures, t's < 1.

These manipulations were used to induce feelings of physical invulnerability (or not) in the studies below, testing the prediction