FlashReport

Self-affirmation counteracts the effects of burdens on judgments of distance

Loreal Shea, E.J. Masicampo *

Wake Forest University, Greene Hall 415, P.O. Box 7778 Reynolda Hall, Winston-Salem, NC 27109, USA

HIGHLIGHTS

- We observed as in previous work that burdens increased distance judgments.
- Self-affirmation eliminated the effect of burdens on distance judgments.
- Self-affirmation's effect was not via mood shifts or thoughts of supportive others.
- Self-affirmation can counteract biases that result from physical challenges.

ARTICLE INFO

ABSTRACT

When a person's capacity for physical movement is diminished, judgments of the environment change—unless, perhaps, the person is able to self-affirm. We observed as in previous work that physical burdens altered judgments of distance. When participants wore a heavy backpack rather than a light one, they estimated a landmark to be significantly farther away. Crucially, self-affirmation eliminated this effect. When participants self-affirmed prior to making judgments, the weight of the backpack had no effect on distance estimates. The influence of self-affirmation was not accounted for by effects of self-affirmation on mood or by increased thoughts of supportive friends and family among the self-affirmed. These data reveal a simple strategy for counteracting the effects that bodily constraints can have on visual judgments. They also expose the far reaching effects of self-affirmation, which can counteract reactions not only to psychological challenges but to physical ones as well.

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Introduction

As locomotion becomes difficult, visual judgments change to reinforce the high cost of moving about. When people are physically burdened, they judge distances to be especially far (Proffitt, Stefanucci, Banton, & Epstein, 2003). When people are tired or unfit, they judge hills to be especially steep (Bhalla & Proffitt, 1999). Such is the relationship between bodily states and visual judgments according to an accumulating body of evidence (Proffitt, 2006a, 2006b).

Recent research reveals that these bodily influences on visual judgments can be counteracted. Schnall, Harber, Stefanucci, and Proffitt (2008) replicated previous work (Bhalla & Proffitt, 1999) such that heavy burdens caused people to judge hills as steeper. More important, Schnall and colleagues also found that the presence of a supportive friend (or the mere thought of one) eliminated that effect. The authors reasoned that social support restores the perceived capacity to act when people are physically burdened, undoing any influence of the burdens on visual judgments. The present work examined whether

the effect of burdens on judgments could be counteracted through a more intrapersonal means—via self-affirmation.

People become self-affirmed when they receive positive feedback about themselves or when they reflect privately on their core values and how they uphold them (Cohen, Aronson, & Steele, 2000; Steele, 1988). Crucially, self-affirmation is not a means for self-enhancement but for restoring the integrity of the self (Steele, 1988). A major consequence of self-affirmation is to release people from the defensive cognitive biases that result from self-threat (Sherman & Cohen, 2002). For example, self-affirmation counteracts the tendency to blame failure on external circumstances (Sherman & Kim, 2005) as well as the tendency to discount information that undermines one's beliefs (Cohen et al., 2000). Thus, "self-affirming can promote more objective appraisal of otherwise threatening information" (Harris & Epton, 2010; p. 440). Stated differently, psychological challenges incite biased responses, but self-affirmation can counteract such reactions.

We suspected that self-affirmation can counteract the biased judgments that occur when people are physically burdened. Indeed, prior work suggests that self-affirmation counteracts reactions not only to psychological challenges but also to bodily challenges such as stress and illness (for a review, see Harris & Epton, 2009). A heavy burden is another kind of challenge to the body, and exaggerated

* Corresponding author at: Department of Psychology, Wake Forest University, Greene Hall 415, P.O. Box 7778 Reynolda Hall, Winston-Salem, NC 27109, USA.
E-mail addresses: lcshea13@gmail.com (L. Shea), masicaej@wfu.edu (E.J. Masicampo).

distance estimates (e.g., Proffitt et al., 2003) may represent a self-protective bias in response to that challenge. Furthermore, self-affirmation may counteract such exaggerated responses.

The present research

We hypothesized that self-affirmation can counteract shifts in visual judgments that occur when the body is constrained. We attempted to replicate the finding that physical burdens increase distance judgments (Proffitt et al., 2003). In our study, participants estimated the distance to a landmark. We tested whether wearing a heavy backpack would cause greater distance estimates than wearing a light one. Crucially, we also tested whether self-affirmation could counteract that effect. Before making distance estimations, half of participants self-affirmed. We predicted that participants who self-affirmed would not show increased distance estimates when burdened.

We sought additionally to test two potential explanations for the predicted pattern of results. First, it is possible that self-affirmation influences distance judgments via mood effects. Prior work has linked sad moods to exaggerated geographical estimates (e.g., of hill slant; Riener, Stefanucci, Proffitt, & Clore, 2011), and so it is plausible that positive moods induced by self-affirmation may counteract such exaggerations. There is no consistent evidence that self-affirmation affects mood (McQueen & Klein, 2006), however, and so we anticipated that self-affirmation would restore visual judgments independent of mood effects.

Second, it is possible that self-affirmation influences distance judgments via reminders of supportive friends and family. We used a self-affirmation manipulation that requires people to write about core values (Cohen et al., 2000), a manipulation that might induce some to write about close relationships. Indeed, among the 11 values that participants have the option to write about, there are a number (e.g., friends and family, romance, social skills) that could encourage writing about close relationships. Such reflection on close relationships could allow people to feel more capable and less burdened due to the salience of available social support, thereby counteracting effects on visual judgments (Schnall et al., 2008). We therefore tracked the topics people wrote about in the self-affirmation condition to see if thoughts of supportive others explained the observed effects. While we anticipated that thoughts of supportive others would help counteract exaggerations in distance judgments, we also suspected that self-affirmation would have an influence above and beyond that. Self-affirmation involves reflecting on how one upholds personally important values (Cohen et al., 2000), which is an altogether different phenomenon than thinking about how one is served and supported by friends and family. Therefore, our hypothesis was that self-affirmation, independent of any mood effects or reflection on supportive relationships, would counteract the effects of physical burdens on judgments of distance.

Method

Seventy undergraduates (59 females; $M_{age} = 19.0$, $SD_{age} = 1.07$) participated for course credit. The study comprised a 2 (affirmation condition: self-affirmation vs. no affirmation) × 2 (backpack condition: heavy vs. light) between-subject design with participants randomly assigned to condition.

Participants arrived at the laboratory individually. An experimenter greeted each participant and explained that the study involved a writing task and a perception task. This experimenter then brought each participant and a packet of questionnaires to an outside table where a second experimenter was waiting to oversee the study. This second experimenter and the participant were always of the same sex, and the experimenter was blind to each participant's affirmation condition throughout.[1] This was achieved by having the experimenter guide the

participant through the packet without looking at or having contact with it.

The first task in the packet was an affirmation manipulation used by Cohen et al. (2000). In the self-affirmation condition, participants ranked 11 values and wrote a personal essay about their highest ranked value. In the no affirmation condition, participants ranked the same 11 values but wrote an impersonal essay about their sixth-highest ranked value.

Participants then reported their weight and completed the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988). Meanwhile, the experimenter prepared a backpack. In the light condition, the backpack was left empty. In the heavy condition, 5 lb weights were added to the backpack until additional weight would have caused the backpack to exceed either 20% of the participant's body weight or 25 lbs.

Participants were then instructed to stand on a nearby sidewalk, to wear the backpack, and to make a number of estimations, including the wind speed, the temperature, and the critical measure: the distance in feet to a landmark that was 130 ft away.[2] No cover story for the backpack or the perception measures was offered. The experimenter then brought participants back to the lab where they completed a demographics questionnaire and were debriefed.

Results

The distribution of distance estimates was positively skewed, and so we log transformed the estimates to achieve normality. A two-way analysis of variance (ANOVA) was conducted predicting transformed distance estimates as a function of the affirmation and backpack conditions. The results revealed no main effects, $Fs < 1.74$, $ps > .19$, and a significant two-way interaction, $F(1, 69) = 5.42$, $p = .023$, $\eta_p^2 = .08$ (see Fig. 1).

Planned comparisons revealed the nature of the two-way interaction. We tested for replication of prior work showing that physical burdens can cause an increase in judgments of distance (Proffitt et al., 2003). We compared the light and heavy backpack conditions within the no affirmation group. The results revealed a significant effect, $F(1, 66) = 6.99$, $p = .010$, $\eta_p^2 = .10$, such that participants in the heavy backpack condition made larger distance estimates than participants in the light backpack condition.

An additional comparison tested whether self-affirmation counteracted this effect. It compared the no affirmation and self-affirmation conditions within the heavy backpack group. The results revealed another significant effect, $F(1, 66) = 4.80$, $p = .032$, $\eta_p^2 = .07$, such that burdened participants who self-affirmed made shorter distance estimates than burdened participants who did not self-affirm.

A further comparison revealed that whereas the affirmation manipulation was influential in the heavy backpack group, it had no effect on participants within the light backpack group, $F(1, 66) = 1.16$, $p = .29$. In addition, within the self-affirmation group, there was no effect of the backpack manipulation (light vs. heavy), $F(1, 66) = 0.49$, $p = .49$. Thus, self-affirmation eliminated any difference between light and heavy backpack wearers in terms of distance estimates.

Roles of mood and supportive others

We assessed whether mood effects could explain why self-affirmation counteracted the effect of heavy backpacks on distance judgments. Scores for both valence and arousal were calculated from participants' responses on the BMIS. Neither score was affected by the affirmation manipulation, $Fs < .83$, $ps > .36$. Furthermore, we ran a regression model predicting distance judgments as a function of the experimental conditions and their interaction while controlling for valence and arousal main effects and any interactions between valence

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[1] A prior pilot study revealed a participant-sex-by-experimenter-sex interaction that was difficult to interpret, and so we opted in this study to employ same-sex pairings.

[2] Wind and temperature estimates were not analyzed (i.e. as an added control) because the true values of both varied across days and even across sessions within the same day.
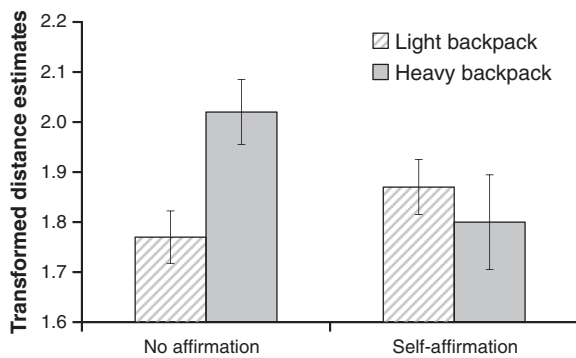
Fig. 1. Log transformed distance estimates as a function of the affirmation and backpack conditions. Error bars represent standard error.

and arousal with the experimental conditions. In this analysis, the backpack-by-affirmation interaction remained significant, $\beta = -.46$, $t(68) = -2.21$, $p = .031$. Thus, mood effects did not account for the observed influence of self-affirmation on distance judgments.

We also assessed whether reflecting on supportive relationships could account for the effects of self-affirmation. A rater who was blind to condition coded whether participants' essays mentioned close relationship partners. For this analysis, we focused only on participants in the heavy backpack condition, in which self-affirmation had a significant effect on distance estimates. A regression analysis revealed that writing about close relationships was linked to lower distance estimates albeit non-significantly, $\beta = -.27$, $t(32) = -1.57$, $p = .13$, and so this link could not have mediated the relationship between self-affirmation and distance judgments among participants wearing heavy backpacks. Despite the non-significant link, however, we note that the effect size of this link ($d = .56$) is highly similar to (and thus replicates) the effect size found by Schnall and colleagues (Study 2; 2008) when testing whether reflecting on a supportive (vs. neutral) other reduced visual estimates among the physically burdened ($d = .61$).

Discussion

When a person's capacity for physical movement is diminished, judgments of the environment change—unless, that is, the person self-affirms. We observed as in previous work (Proffitt et al., 2003) that physical burdens altered distance judgments. When participants wore a heavy backpack rather than a light one, they estimated a landmark to be significantly farther away. Crucially, self-affirmation eliminated this effect. When participants self-affirmed immediately beforehand, the weight of the backpack had no effect on distance judgments.

These data reveal a novel strategy for counteracting the effects that bodily constraints can have on visual judgments. Factors that make it challenging to move, including being physically burdened or fatigued, can cause distances to be judged as farther and hills to be judged as steeper (Proffitt, 2006a, 2006b). Certain psychological factors can counteract these effects. If a person is sufficiently motivated to move, then the effect of bodily constraints on distance judgments can be overridden (Cole, Balcetis, & Zhang, 2013). Furthermore, if a person feels supported by close others, then the usual effect of burdens on judgments of hill steepness is no longer seen (Schnall et al., 2008). The present paper found that a simple self-affirmation procedure, which involved having participants reflect on an important personal value (Cohen et al., 2000), can have a similar effect.

Self-affirmation restored participants to normalcy when they were encumbered by a physical burden. This pattern is consistent with the notion that self-affirmation restores the integrity of the self (Steele, 1988) and counteracts self-protective cognitive biases (Sherman &

Cohen, 2002). Self-affirmation did not decrease distance judgments for all participants. Instead, it decreased distance judgments specifically for participants who were challenged by heavy weight. In that specific circumstance, in which participants usual capacities were constrained, self-affirmation restored participants to a more normal mode of thinking and judgment.

These data help expose the far reaching effects of self-affirmation. A large body of work has established diverse benefits of self-affirmation in coping with such challenges as negative feedback (Sherman & Cohen, 2002), stereotype threat (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Martens, Johns, Greenberg, & Schimel, 2006), and threatening health information (Harris, Mayle, Mabbott, & Napper, 2007; Harris & Napper, 2005). The present study suggests that challenges imposed on the body and the resulting effects on visual judgment can likewise be protected against through the simple act of self-affirming.

A limitation of the current experiment is that it tentatively ruled out mediators (mood and thoughts of supportive others) but did not confirm any. We propose a few potential mechanisms that may be assessed in future work. Broadly speaking, self-affirmation counteracts self-serving and self-protective cognitive biases in the presence of challenges and threats (Sherman & Cohen, 2002). Therefore, the observed effect of self-affirmation on visual judgments may be caused by a broad shift away from self-protection and self-enhancement when people are physically burdened. The mechanism may also be more task-specific. Prior work has revealed self-affirmation's effects to be mediated by reduced feelings of inadequacy (van Dijk, Koningsburgen, Ouwekerk & Wesseling, 2011) and vulnerability (Klein, Harris, Ferrer, & Zajac, 2011) and greater intentions to engage in potentially challenging acts (e.g., Armitage, Harris, Hepton, & Napper, 2008; Pietersma & Dijkstra, 2011). These may also be true of those who self-affirm while physically burdened. These people may cease to feel inadequate about physical capabilities when encumbered, or they may be highly willing to engage in physical acts despite being burdened, thereby counteracting biases in visual judgment.

Conclusion

The present work demonstrates the interaction between mind and body in determining how people perceive and interact with the world. A growing body of work has demonstrated that bodily influences are crucial for understanding how people judge the environment around them. More recent work has revealed that social (Schnall et al., 2008), emotional (Riener et al., 2011), and motivational (Cole et al., 2013) factors can moderate or counteract those bodily influences. We found additionally that a simple consideration of one's values, and more specifically, the act of self-affirming, can counteract the influence of bodily constraints on the mind.

Acknowledgments

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