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More Than Skin Deep: Visceral States Are Not Projected Onto Dissimilar Others

Ed O'Brien and Phoebe C. Ellsworth
University of Michigan

Abstract

What people feel shapes their perceptions of others. In the studies reported here, we examined the assimilative influence of visceral states on social judgment. Replicating prior research, we found that participants who were outside during winter overestimated the extent to which other people were bothered by cold (Study 1), and participants who ate salty snacks without water thought other people were overly bothered by thirst (Study 2). However, in both studies, this effect evaporated when participants believed that the other people under consideration held political views opposing their own. Participants who judged these dissimilar others were unaffected by their own strong visceral-drive states, a finding that highlights the power of dissimilarity in social judgment. Dissimilarity may thus represent a boundary condition for embodied cognition and inhibit an empathic understanding of shared out-group pain. Our findings reveal the need for a better understanding of how people's internal experiences influence their perceptions of the feelings and experiences of those who may hold values different from their own.

Keywords

social judgment, visceral states, dissimilarity, egocentric projection, social perception, intergroup dynamics, judgment, theory of mind, social cognition

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Many people can relate to the pain of being stuck outside on a winter day or caught without water after exercise. Recent psychological research, however, reveals that visceral states (e.g., cold and thirst) affect not only people's own subjective feelings in the moment but also their broader perceptions of the world (Risen & Critcher, 2011). One of the most consistent findings highlights the assimilative effect of visceral feelings on social judgment. For example, when people are dehydrated, they perceive others as thirsty (Van Boven & Loewenstein, 2003), and when frightened, they perceive others as afraid (Van Boven, Loewenstein, & Dunning, 2005).

A number of possible mechanisms could explain this bias (Gilovich, 1990; Krueger & Clement, 1997; Marks & Miller, 1987; Mullen & Hu, 1988), but it has generally been attributed to a limited appreciation for "cold" states when experiencing "hot" affect. For instance, people become overly focused on feeling thirsty (a hot state) because it is difficult to imagine a cold state—such as the sensation of having one's thirst quenched—when such a salient sensation is activated. Thus, perceptions become overwhelmed by thirst-related thoughts and judgmental cues (Ariely & Loewenstein, 2006; Loewenstein, 1996).

However, the bias may also reflect a sense of shared similarity and common humanity with other people. Because they do not have access to others' internal states, people use their own subjective experience as an immediately accessible point of reference to gauge others' private knowledge (Dunning & Hayes, 1996; Epley, Keysar, Van Boven, & Gilovich, 2004; Nickerson, 1999). As a result, people often assume that others share their traits, attitudes, and perspectives. In one classic demonstration of these *egocentric projections*, participants who agreed to wear a sandwich board overestimated the number of other people who would agree to wear it, whereas those who refused to wear the board underestimated the number of people who would agree to wear it (Ross, Greene, & House, 1977). In another seminal study, students who cheated on an exam overestimated the prevalence of cheating by their classmates (Katz & Allport, 1931). Thus, the social projection of visceral feelings may derive from the tendency to imagine another person's situation by first imagining oneself in the same situation (Van Boven & Loewenstein, 2003); in other words, social projection of visceral feelings may reflect a more general projection of similarity.

Corresponding Author:
Ed O'Brien, Research Center for Group Dynamics, Institute for Social Research, University of Michigan, 426 Thompson St., Ann Arbor, MI 48106
E-mail obrieneh@umich.edu

If this rationale is correct, it suggests that people may not project visceral states onto others who are clearly different from themselves. Previous research has demonstrated that people are less likely to generalize subjective states to others who do not share similar life experiences with them (Robinson, Keltner, Ward, & Ross, 1995). For example, in one study, college students projected their preferences (e.g., desire for body piercings, stance on capital punishment) onto students of their own university but not onto students of different universities (Ames, 2004). Although the literature has typically discussed the social projection of traits, attitudes, and values (for a review, see Robbins & Krueger, 2005), people may also fail to project strong feelings onto others if the underlying mechanism involves perceived similarity with the people in question.

To test this possibility, we recruited participants to make social judgments about a similar or dissimilar person while experiencing (or not experiencing) cold (Study 1) and thirst (Study 2). Because people should become less egocentrically biased when they perceive others as different from themselves, we predicted that judgments of dissimilar others would be unaffected by visceral states.

Study 1: Feeling Cold

In Study 1, participants were recruited either outdoors or indoors during winter. We predicted that they would project their physical feeling of coldness only onto others who shared their political values.

Method

Participants. Participants were 120 student volunteers (62.5% female, 37.5% male; 73.3% Caucasian, 26.7% other; mean age = 19.48 years) recruited individually from public campus areas.

Procedure. In January 2011, an experimenter approached students who were sitting either indoors in the university library or outdoors at a bus stop near the library. The students were asked to participate in a study allegedly about reading comprehension. Winter weather in the Midwestern United States can be quite cold; during this study, ambient temperatures ranged from −14 ºF to 30 ºF (M = 6 ºF). Thus, we manipulated visceral experience by comparing a warm indoor condition with a cold outdoor condition (n = 60 for each condition).

Participants were not taken to a lab, but rather were tested at the place where they were recruited. We asked participants to read a short story and then answer questions about what they read. We adapted the story from prior research (Van Boven & Loewenstein, 2003) by adding a similarity/dissimilarity manipulation that has been shown in prior research to have a strong effect (Mitchell, Macrae, & Banaji, 2006): Participants were randomly assigned to read about a protagonist who was either a left-wing, pro-gay-rights Democrat or a right-wing, anti-gay-rights Republican (named "Kim" for female participants and "Jim" for male participants). The protagonist goes hiking in winter to take a break from a political campaign but gets lost with no food, water, or extra clothes (for the full text of the story, see the Supplemental Material available online).

After reading the story, participants answered forced-choice questions asking what was most unpleasant for the hiker (hunger, thirst, or cold) and what the hiker most regretted not packing (food, water, or extra clothes). They also rated how hungry, thirsty, and cold both they and the hiker felt using continuous scales ranging from 0, *not at all*, to 10, *extremely*. Filler items about the story were mixed in to reduce suspicion (e.g., "What was the name of the mountain?").

Participants then answered a forced-choice item asking whether their political affiliation was similar or dissimilar to that of the hiker. Finally, they provided demographic information, including information on their political values. We then conducted a funnel debriefing (none of the participants indicated suspicion about the purpose of the study).

Results and discussion

Similarity. Thirty indoor participants and 31 outdoor participants rated themselves as having a similar political orientation as the hiker; the remaining participants rated themselves as having a dissimilar political orientation. These results were confirmed by participants' own statements about their political values. For example, over 90% of participants' ratings of whether they held similar or dissimilar political views as the hiker matched the participants' stated political affiliation. Removing the few participants with inconsistent responses did not influence the results, so the following analyses include all participants.

Participants' visceral states. A linear regression analysis revealed a main effect of location on participants ratings of how cold they felt ($\beta = 4.01$, $p < .001$). As expected, regardless of whether they identified themselves as similar or dissimilar to the protagonist in the story, all outdoor participants were colder (*similar* condition: $M = 6.26$, $SD = 1.39$; *dissimilar* condition: $M = 6.31$, $SD = 2.11$) than indoor participants were (*similar* condition: $M = 1.83$, $SD = 1.60$; *dissimilar* condition: $M = 2.30$, $SD = 1.66$). In contrast, outdoor participants did not rate themselves as hungrier or thirstier than indoor participants did, regardless of similarity condition.

Primary analyses. Data were analyzed according to a 2 (political orientation: similar vs. dissimilar) × 2 (location: indoors vs. outdoors) design. Does being freezing cold influence social judgment? Yes—but only when judging similar others (see Fig. 1). First, replicating previous research, our findings showed that participants in the *similar* condition were more likely when outdoors (94%) than when indoors (57%) to indicate that cold was more unpleasant for the hiker than hunger or thirst was; however, responses of participants in the

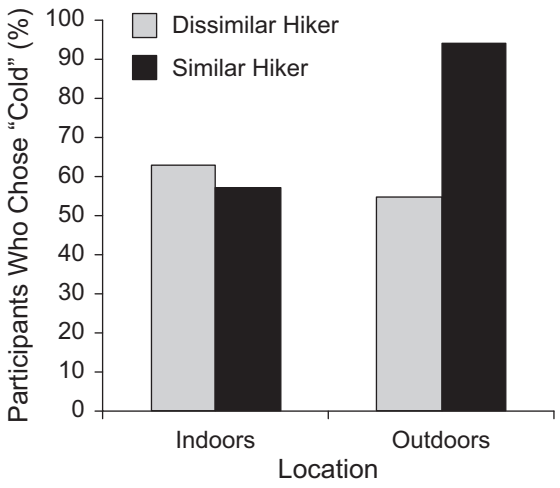

Fig. 1. Results of Study 1: participants' descriptions of the hiker's visceral state as a function of their location and their political similarity to the hiker. Participants read a story about a hiker and were then asked, "Is hunger, thirst, or cold most unpleasant for the hiker?" This graph shows the percentage of participants who responded with "cold."

dissimilar condition were unaffected by location (outdoors condition: 55%, indoors condition: 63%). A logistic regression predicting the choice of "cold" from the interaction between political similarity and location was significant ($\beta = -2.75$, $p = .005$).

Second, participants in the *similar* condition were more likely while outdoors (81%) than while indoors (37%) to indicate that the hiker most regretted not packing extra clothes; responses of participants in the *dissimilar* condition were unaffected by location (outdoors condition: 41%, indoors condition: 43%). A logistic regression predicting the choice of "extra clothes" from the interaction between political similarity and location was significant ($\beta = -2.05$, $p < .01$).

Third, participants in the *similar* condition rated the hiker as colder while they were outdoors ($M = 7.81$, $SD = 1.20$) than while they were indoors ($M = 5.50$, $SD = 1.93$); responses of participants in the *dissimilar* condition were, again, unaffected by location (outdoors condition: $M = 5.76$, $SD = 1.73$; indoors condition: $M = 5.67$, $SD = 2.04$). A linear regression predicting ratings of the hiker's coldness from the interaction between political similarity and location was significant ($\beta = 2.21$, $p < .001$). Furthermore, participants in the *similar* condition did not rate the hiker as hungrier or thirstier regardless of whether they were indoors or outdoors. Finally, participants' own coldness predicted judgments of how cold similar others felt ($\beta = -0.71$, $p = .004$)—but not how cold dissimilar others felt ($\beta = 0.06$, $p = .86$). No other differences were significant.

These findings support our hypothesis. Despite cold winter weather, participants did not project their feelings of coldness onto others who had opposing political views (for additional results of these analyses, see the Supplemental Material). In Study 2, we tested our hypothesis in a controlled laboratory setting using a different visceral state.

Study 2: Feeling Thirsty

In Study 2, a new group of participants was randomly assigned to two conditions, in which they felt either thirsty or nonthirsty, before reading the same hiker story as in Experiment 1. We predicted that they would project their thirstiness only onto a hiker whose political views were similar to theirs.

Method

Participants. Participants were 141 university students (49.6% female, 50.4% male; 71.6% Caucasian, 28.4% other; mean age = 19.01 years). The students received course credit for their participation.

Procedure. Participants came into the laboratory for a study allegedly on nutrition and attention. First, they sampled a selection of food. Following prior research (e.g., Aarts, Dijksterhuis, & De Vries, 2001), we gave all participants the same salty snacks: vanilla wafers, potato chips, gummy rings, and saltines. (Pretesting had confirmed that these snacks induced thirst. See the Supplemental Material for details of the pretesting.) Participants were randomly assigned to eat the snacks either with a cup of water (the nonthirsty quenched condition; $n = 68$) or without a cup of water (the thirsty parched condition; $n = 73$). They were then presented with the same story and questionnaires used in Study 1, after which we conducted a funnel debriefing (no participants indicated suspicion about the purpose of the study).

Results and discussion

Similarity. Thirty quenched and 35 parched participants rated themselves as having a similar political orientation as the hiker; the remaining participants rated themselves as having a dissimilar political orientation. As in Study 1, these results were confirmed by high consistency (> 90%) between the political values stated by participants and their ratings of how similar their values were to those of the hiker. Removing the few participants who had inconsistent responses did not influence the results, so the following analyses include all participants.

Participants' visceral states. A linear regression analysis revealed a main effect of thirst condition on participants' ratings of how thirsty they felt ($\beta = 3.50$, $p < .001$). As expected, regardless of how similar their political views were to those of the hiker, all parched participants were thirstier (*similar* condition: $M = 6.20$, $SD = 1.26$; *dissimilar* condition: $M = 6.16$, $SD = 0.92$) than quenched participants were (*similar* condition: $M = 2.33$, $SD = 1.63$; *dissimilar* condition: $M = 2.66$, $SD = 1.40$). However, participants in the parched condition did not rate themselves as hungrier or colder than participants in the quenched condition did, regardless of similarity condition.

Primary analyses. Data were analyzed according to a 2 (political orientation: similar vs. dissimilar) × 2 (thirst: quenched vs. parched) design. Results replicated those of Study 1. Participants in the *similar* condition were more likely to indicate that thirst was more unpleasant for the hiker than hunger or cold when they themselves were parched (71%) than when they were quenched (20%); responses of participants in the *dissimilar* condition were unaffected by the thirst manipulation (parched condition: 37%, quenched condition: 26%). A logistic regression predicting the choice of "thirst" from the interaction between political similarity and thirst condition was significant ($\beta = -1.81$, $p < .02$). Participants in the *similar* condition were also more likely to indicate that the hiker most regretted not packing "extra water" when they were parched (54%) than when their thirst was quenched (13%); participants in the *dissimilar* condition were again unaffected by the thirst manipulation (parched condition: 21%, quenched condition: 18%). A logistic regression predicting the choice of "extra water" from the interaction between political similarity and thirst condition was significant ($\beta = -1.88$, $p < .03$).

Finally, participants rated the hiker as thirstier when they were parched ($M = 7.46$, $SD = 1.29$) than when their thirst was quenched ($M = 5.43$, $SD = 2.10$); participants in the *dissimilar* condition were unaffected by the thirst manipulation (parched condition: $M = 5.71$, $SD = 2.10$; quenched condition: $M = 5.42$, $SD = 2.19$). A linear regression predicting ratings of the hiker's thirstiness from the interaction between political similarity and thirst condition was significant ($\beta = 1.73$, $p < .01$). In contrast, participants in the parched condition did not rate the hiker as hungrier or colder than participants in the quenched condition did. Again, participants' own thirstiness predicted judgments of how thirsty similar others felt ($\beta = 0.54$, $p = .02$)—but not how dissimilar others felt ($\beta = 0.04$, $p = .89$). No other differences were significant.

These findings further suggest that perceived dissimilarity may override strong visceral feelings. Participants in the *dissimilar* condition were unaffected by thirst despite eating salty snacks without water. (See the Supplemental Material for additional results of these analyses.)

General Discussion

Social life is typically divided between people who share the same values and beliefs and those who do not. Prior research suggests that people often isolate their internal perspectives from those on the other side of this divide (for a review, see Robbins & Krueger, 2005). The present research extends the power of dissimilarity to visceral experiences. Despite the well-documented assimilative effect of visceral states, participants were unaffected by their own cold and thirst when evaluating people with opposing political values.

Theoretical implications

These findings illustrate the operative role of perceived dissimilarity in social judgment. Previous research suggests that people are less egocentrically biased when judging dissimilar others because they rely on stereotypes (e.g., "Those students don't share my stance on capital punishment because they are all uptight conservatives") or on prestored knowledge (Ames, 2004). However, this suggestion cannot account for the failure to project visceral states. Our findings cannot be explained by any obvious political stereotype about feeling cold or thirsty (e.g., "Liberals don't share my thirst because they drink more water than I do"); all else being equal, knowledge of another person's politics should not influence how cold or thirsty one thinks he or she is, but our study suggests that it does. Thus, nonegocentric judgments of dissimilar others may be driven by more automatic, deeply rooted mechanisms. For example, the distinct neural regions associated with perceiving pain in similar versus dissimilar others (Lamm, Meltzoff, & Decety, 2010) may lead to different bottom-up social inferences with varying levels of feedback from one's own affective states.

Mechanisms may also be sensitive to the nature of the dissimilarity that inhibits visceral projection. In our research, dissimilar others (e.g., political opposites) were probably actively disliked by the participants judging them. Future research should address whether this effect is due to any kind of dissimilarity or only to affectively charged domains such as in-group/out-group membership or ally-versus-enemy dynamics. For example, how might people judge a family member who holds opposing political views (Krienen, Tu, & Buckner, 2010)?

A related research direction might examine the effect of dissimilarity on less salient visceral states, such as subtle physical sensations. In other studies, participants who held a warm cup of coffee judged a target person as more socially "warm" (Williams & Bargh, 2008), and those who held a resume on a heavy clipboard thought it was more "weighty" and "important" (Ackerman, Nocera, & Bargh, 2010). These *embodiment effects* may be inhibited by dissimilar targets; liberal undergraduates holding a warm drink may not consider Republicans any nicer than they did before.

These effects might further apply to broad social judgments. For example, people exposed to hot weather become more concerned about global warming (Li, Johnson, & Zaval, 2011). However, the same people may not care about global warming in dissimilar areas of the world because they fail to link their own hot states with the condition of people in those regions; thus, Westerners may inadvertently neglect the woes of problematic areas. Exploring the causal role of dissimilarity in these domains suggests interesting possibilities for future research.

Applied consequences

The inability to appreciate "cold" states while experiencing "hot" affect has occasionally been conceptualized less as a bias than as an enhanced capacity to empathize with other people (e.g., Loewenstein, 2005). For example, in one study, participants were less likely to endorse torture while experiencing various forms of pain themselves (Nordgren, McDonnell, &

Loewenstein, 2011). Our research, however, suggests that people may be uninfluenced by their own pain when gauging pain felt by dissimilar others. Thus, if lawmakers first test interrogation practices (as suggested by Nordgren et al., 2011), they may not project the experience onto those for whom it is designed (e.g., suspected terrorists), and this could lead to an unintended acceptance of torture. Similarly, homeless populations often struggle with poor nutrition and intemperate weather; personally feeling hungry and cold may be insufficient to sensitize people who have no long-term worries about food and shelter to the plight of this highly stigmatized out-group (Harris & Fiske, 2006). These consequences suggest a surprising limitation in people's capacity to empathize with others with whom they disagree or differ from. Perceptions of dissimilar others are apparently uninformed by visceral feelings.

To illustrate this point, we ran a follow-up study with University of Michigan students either before (n = 34) or after (n = 28) they ate lunch. In each group, half were asked the following question: "What percentage of the University of Michigan budget should be dedicated to maintaining food quality on campus and ensuring that students have access to high-quality food?" The other half was asked the same question about Ohio State University, a rival school. As expected, hungry students said that a larger percentage of the University of Michigan budget should be allocated toward food (M = 19.19%, SD = 4.83%) than did students who had already eaten (M = 11.12%, SD = 5.92%, $p < .001$). However, hungry students (M = 11.24%, SD = 5.36%) did not say that Ohio State University's food budget should be raised any higher than nonhungry students did (M = 10.93%, SD = 3.99%, $p > .40$). Painful first-hand experiences apparently do not translate into an appreciation of similar pain felt by dissimilar others. Thus, people may not be motivated to help out-groups, even when experiencing shared states.

Conclusion

The results of the two studies reported here suggest that the effect of visceral states on social judgment is eliminated when people judge dissimilar others. It seems counterintuitive that people outside in the freezing cold or eating salty snacks without water could be indistinguishable from those who were warm and whose thirst was quenched, yet participants whose political views were dissimilar to the individual they were judging were surprisingly unaffected by their own strong visceral-drive states. This observation has not been made by prior researchers investigating social judgment, and it reveals the need for a better understanding of when people's own internal experiences influence their perceptions of the internal worlds of others and when they do not. Perceived dissimilarity may shed light on the dynamic interplay between the physical world and social judgment, and more important, its influence may expose deeper constraints on people's ability to appreciate the experiences of those who may be in greatest need of their consideration.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Supplemental Material

Additional supporting information may be found at http://pss.sagepub.com/content/by/supplemental-data

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Supplementary Online Materials

Stimuli

Participants read the following short story (adapted from Van Boven & Loewenstein, 2003). The protagonist (i.e., the hiker) was named "Kim" for female participants and "Jim" for male participants. Brackets represent our manipulation of the hiker's political orientation (adapted from Mitchell, Macrae, & Banaji, 2006):

> Kim spent much of her time participating in events sponsored by religious [secular] and Republican [Democrat] organizations. As a fundamentalist Christian [left-leaning] student, Kim held conservative [liberal] political and social views – and so she was outraged when a local lawmaker proposed a bill in support of [against] gay rights. Kim began working overtime in her volunteer organizations, spending her nights and weekends campaigning against the bill.
>
> Burned out from these long hours, Kim recently decided to take a break and do something fun. She embarked on a short, 6-mile winter hike through Mount Washington.
>
> In the early afternoon during the hike, a sudden snowstorm caused Kim to run into the shelter of a densely forested area. After the storm passed, she searched for the trail but could not find it. As the day wore on, Kim realized that she was hopelessly lost and had no idea how to find her way out of the wilderness. Worse, because she had packed lightly for a short hike, she had not carried much in the way of food, water, or extra clothes. As night fell, Kim was in dire straits: there was no food, no water, and no more extra clothes.

Study 1

Similarity. Similarity was measured by forced-choice responses, confirmed by participants' own political values. They answered a forced-choice item about the political party to which they most identify (*Democrat*, *Republican*, or *Other;* see Figure S1).

Cold. Participants rated their own current levels of coldness, hunger, and thirst. As expected, they only differed on coldness: outdoor participants were not significantly more or less hungry (similar: M=2.52, SD=1.75; dissimilar: M=3.24, SD=2.13) than indoor participants (similar: M=2.80, SD=2.41; dissimilar: M=2.87, SD=2.24) [linear regression β=.38, p=.50], nor were they significantly more or less thirsty (similar: M=3.23, SD=1.69; dissimilar: M=3.45, SD=1.68) than indoor participants (similar: M=2.80, SD=1.47; dissimilar: M=3.37, SD=1.88) [linear regression β=.08, p=.85]. Not surprisingly, there were no main effects of similarity on levels of coldness (p=.29), hunger (p=.90), or thirst (p=.20), nor were there any significant interactions (ps>.40).

***Primary analyses*.** Participants rated the hiker's levels of coldness, hunger, and thirst. As expected, similar participants judged the hiker as colder when they were outdoors, but not more or less hungry (outdoors: *M*=5.39, *SD*=1.20; indoors: *M*=5.97, *SD*=1.75) [linear regression β=-.93, *p*=.11] or thirsty (outdoors: *M*=5.45, *SD*=1.75; indoors: *M*=5.73, *SD*=1.82) [linear regression β=-.71, *p*=.26].

Study 2

Pretesting. Participants ate a selection of store-bought snacks. These snacks were chosen because they were familiar and contained relatively large quantities of salt and sugar. We further hoped that a variety of different snacks (e.g., which differed by color, texture, and taste) would help reduce suspicion compared to any single snack. They were presented all at once in individual quantities of approximately 3 each. In pretesting, a blind independent sample (*N*=13) ate the selection without water. After the last bite, they completed a filler task for 2-3 minutes. Then, they rated the extent to which the snacks made them feel thirsty and the extent to which they desired water (1=*not at all* to 5=*very much*). One-sample t-tests confirmed that the snacks induced people to feel thirsty (*M*=3.92, *SD*=.95, *p*<.001) and to desire water (*M*=3.85, *SD*=.90, *p*<.001).

Similarity. Similarity was confirmed by participants' political party (see Figure S2).

Thirst. Participants rated their own current levels of thirst, hunger, and coldness. As expected, they only differed on thirst: parched participants were not significantly more or less hungry (similar: *M*=1.54, *SD*=1.54; dissimilar: *M*=1.26, *SD*=1.08) than quenched participants (similar: *M*=1.37, *SD*=1.33; dissimilar: *M*=1.29, *SD*=1.16) [linear regression β=-.03, *p*=.93], nor were they significantly more or less cold (similar: *M*=1.06, *SD*=1.35; dissimilar: *M*=1.08, *SD*=1.32) than quenched participants (similar: *M*=.87, *SD*=1.04; dissimilar: *M*=.84, *SD*=.95) [linear regression β=.24, *p*=.38]. Not surprisingly, there were no main effects of similarity on levels of thirst (*p*=.31), hunger (*p*=.81), or coldness (*p*=.93), nor were there any significant interactions (*p*s>.41).

***Primary analyses*.** Participants rated the hiker's levels of thirst, hunger, and coldness. As expected, similar participants judged the hiker as thirstier when they were parched, but not more or less hungry (parched: *M*=6.06, *SD*=1.53; quenched: *M*=5.87, *SD*=1.66) [linear regression β=-.02, *p*=.97] or cold (parched: *M*=6.11, *SD*=1.30; quenched: *M*=5.93, *SD*=1.70) [linear regression β=-.06, *p*=.91].

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Figure S1. Number of participants in Study 1 who identified as "Democrat," "Republican," or "Other" across condition. Under each colored bubble is the number of participants who indicated that they were similar or dissimilar to the hiker.

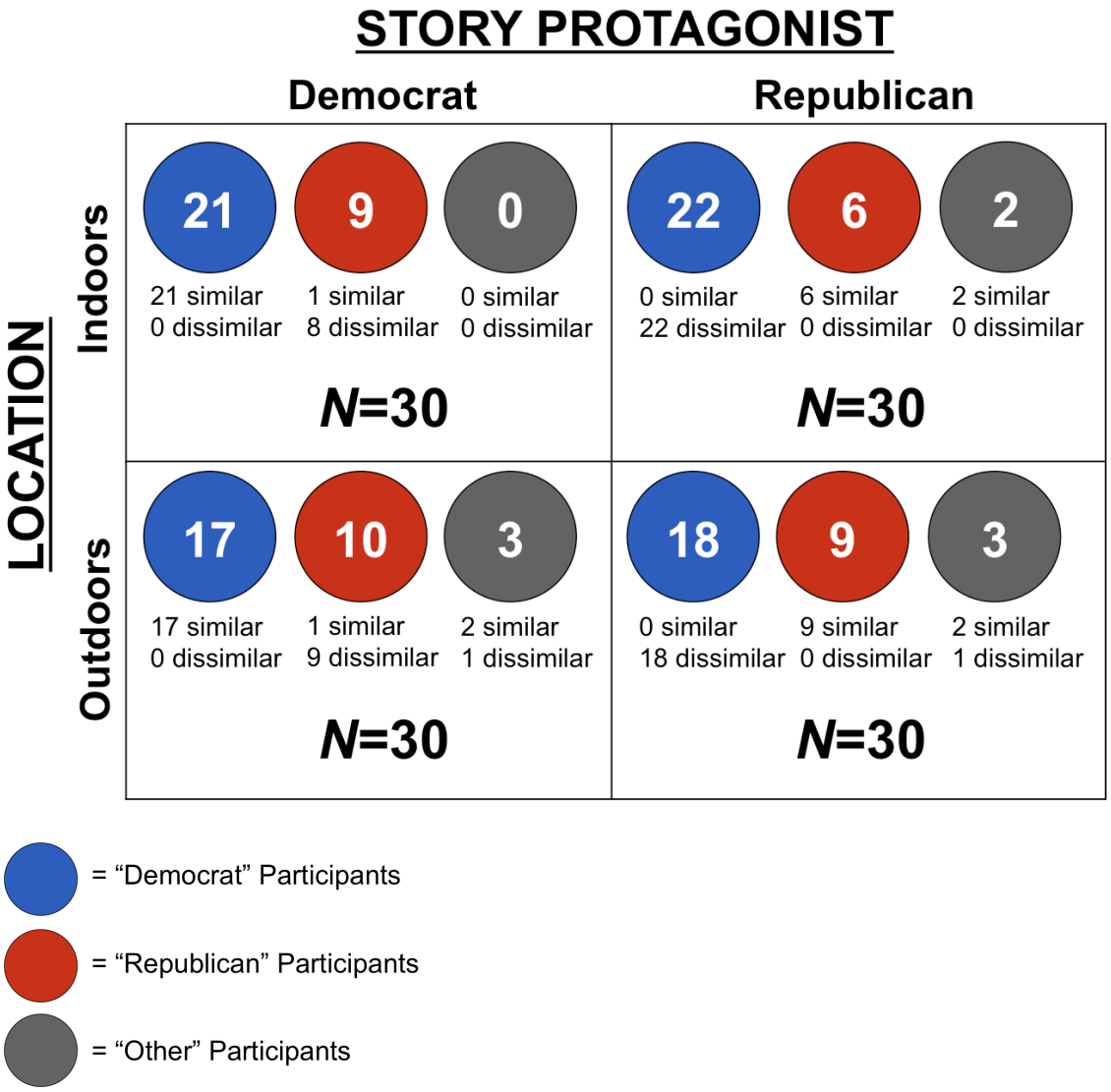

Figure S2. Number of participants in Study 2 who identified as "Democrat," "Republican," or "Other" across condition. Under each colored bubble is the number of participants who indicated that they were similar or dissimilar to the hiker.