
Social Projection of Transient Drive States

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The authors hypothesized that people's predictions of how other people feel in emotionally arousing situations are often based on people's predictions of how they themselves would feel in those situations. Indeed, most participants in Study 1 reported predicting hungry hikers' feelings by mentally trading places with them, imagining what their own feelings would be in the hikers' situation. Because people's predictions of their own feelings tend to be biased in the direction of their current drive states, we hypothesized that mentally trading places would lead to social projection of transient drive states. In Study 2, participants' predictions of whether thirst or hunger would be more bothersome to hikers lost without food or water were biased in the direction of participants' own exercise-induced thirst. Furthermore, participants' predictions of how they would feel in the hikers' situation statistically mediated the effect of exercise on their predictions of the hikers' feelings.

Keywords: *egocentrism; empathy gaps; perspective taking*

The full person does not understand the needs of the hungry.

—Traditional Irish Proverb

As almost anyone who interacts with other human beings can attest, predicting how other people feel in situations that arouse drive states is important. Parenting young children, for example, requires continual predictions of children's feelings of hunger, thirst, and discomfort. Making friends and keeping them and managing employees or dealing with bosses likewise requires continual predictions of others' feelings. Many personal decisions involve analogous predictions about oneself. How much to order at a restaurant, whether to speak at a conference, or whether to run a marathon are based partly on predictions of the hunger, anxiety, and exhaustion one will feel in these situations.

Given the prominence of such emotional perspective taking in everyday life—its importance for social behav-

ior and for individual decision making—one might expect people to be adept at predicting their own and other people's feelings. But recent research indicates that people have difficulty bridging the gap between their current motivations and what their feelings, preferences, and behaviors would be in a different situation (Gilbert, Gill, & Wilson, 2002; Loewenstein, 1996; Loewenstein & Schkade, 1999), and proverbs such as the one above hint that people may have an analogous difficulty bridging the gap between their current motivations and the feelings of other people who are in a different situation.

In this article, we examine emotional perspective taking with respect to drive states. By drive states, we mean motivations caused by bodily needs such as exhaustion, hunger, and thirst. Following Buck's (1999) "biological affects," we assume that people are introspectively aware of their drive states, although just as people do not typically attend to the sensation of their undergarments, such feelings may not always be at the forefront of their attention. We hypothesized, first, that people's predictions of the feelings of other people who are in a situation that arouses drive states are based largely on their predictions of how they themselves would feel in that situation. We hypothesized, second, that because individuals' predictions of their own feelings are biased in the direction of their current drives, people would project their own momentarily aroused drives onto their predictions of others' feelings.

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Social Projection

A venerable tradition in social psychology has documented people's tendency to project their own thoughts, preferences, and behaviors onto other people (Cronbach, 1955; Ichheiser, 1946; Sherif & Hovland, 1961). For instance, people who agree to wear a large sandwich board admonishing the viewer to "REPENT" are more likely to predict that other people would agree to be similarly attired than people who would not don the sign (L. Ross, Greene, & House, 1977), people who behave competitively are more likely than those who behave cooperatively to expect aggressive behavior from others (Kelley & Stahelski, 1970), and people who prefer European dramas to American comedies think their preference is more widespread than those with the opposite cinematic preference (Gilovich, 1990). In short, people typically overestimate the similarity between themselves and other people who are in similar situations or faced with similar decisions.

Several mechanisms underlie social projection (Krueger & Clement, 1997; Marks & Miller, 1987). First, information about the self is sometimes the best (and sometimes the only) information one has about other people, so one's self is reasonably used to make inferences about others (Dawes, 1989, 1990; Hoch, 1987). Second, people may inflate popular agreement with their own attitudes and behaviors out of a desire to fit in, be "normal," or to otherwise maintain favorable self-views (Krueger & Clement, 1994; L. Ross et al., 1977). Third, because people experience their perceptions as veridical, unbiased representations of the world rather than subjective constructions, they assume that others will share their perceptions (Gilovich, 1990; Gilovich, Jennings, & Jennings, 1983; Griffin & Ross, 1991; L. Ross & Ward, 1995). Fourth, because people tend to associate with similar others, they are selectively exposed to other people who share their attitudes and behaviors, although they do not fully appreciate that this is the case (Bosveld, Koomen, & van der Pligt, 1994; Deutsch, 1988). Finally, people may use their own perceptions as a judgmental anchor from which they adjust—usually insufficiently (Epley & Gilovich, 2002)—to accommodate differences between themselves and others (Epley, Keysar, Van Boven, & Gilovich, 2003; Nickerson, 1999).

As this brief review implies, research on social projection has focused on preferences, attitudes, and behaviors that are relatively stable. Decisions about sandwich board attire or competitive tendencies or preferences for *Cinema Paradiso* over *Caddy Shack* seem to reflect relatively enduring perceptions and preferences (M. Ross, 1989). Do people also project their more transient drive states onto other people? Under normal circumstances, people are not hungry, overheated, or thirsty for extended periods of time. (Indeed, the very purpose of drive states

is to motivate people to take actions that eliminate them: Being hungry engenders behavior that eliminates hunger.) Because fluctuations in drive states occur relatively frequently and are presumably salient, one might expect people to factor out their influence when making predictions about other people and, hence, not to project those states onto others. We suspected, however, that people would in fact project their drives when predicting others' feelings and, furthermore, that this projection would stem from the strategy people use to predict how other people feel in situations that arouse drive states.

Social Prediction as Self-Prediction

In addition to focusing on relatively stable attitudes, preferences, and behaviors, previous research on social projection also has focused on people's predictions about other people who are in similar situations or faced with similar decisions as themselves. This emphasis is represented by the horizontal dashed arrow at the top of Figure 1. Examinations of mechanisms underlying social projection have therefore focused on reasons why people overestimate the similarity between themselves and others. Our focus is somewhat different. We investigate people's predictions of how other people would feel in a different, emotionally arousing situation, as represented by the lower right box in Figure 1.

We hypothesized that such emotional perspective taking is often based on people's predictions of what their own feelings would be in the target's situation. We suggest, in other words, that emotional perspective taking entails two judgments: (a) people's predictions of how they themselves would feel in the target's situation (the vertical solid arrow in Figure 1) and (b) people's adjustments to these self-predictions to accommodate perceived differences between themselves and others (the horizontal solid arrow in Figure 1). Notice that social projection can arise from either of these judgments. As in previous research, people can overestimate the similarity between themselves and others. But even if people are perfectly calibrated in their assessment of the similarity between themselves and others, the accuracy of social predictions depends critically on the accuracy of self-predictions. If people perceive themselves to be similar to others, then mispredictions of the self will produce mispredictions of other people.

Empathy Gaps in Self-Prediction

Indeed, people's predictions of how they would feel and behave in different situations are biased in the direction of their current emotional state. We have found, for example, that buyers tend to underestimate how attached they would be to an object and how much they would value it if they owned it (Loewenstein & Adler, 1995; Van Boven, Dunning, & Loewenstein, 2000; Van

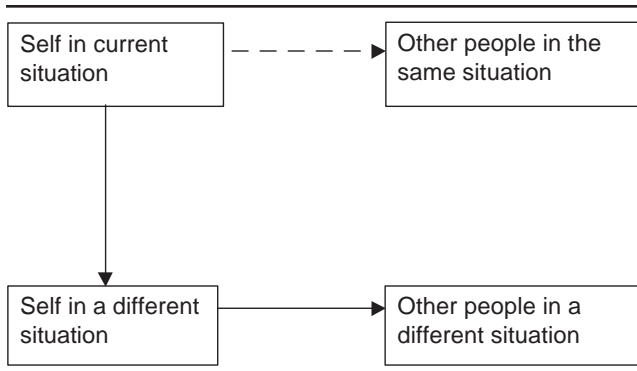


Figure 1 Schematic representation of people's predictions of other people who are in a similar situation or faced with a similar decision as the self (the horizontal dotted arrow) and people's predictions of other people who are in a different situation than the self (the two solid arrows).

Boven, Loewenstein, & Dunning, 2003). Similarly, people who are currently hungry expect that high calorie, unhealthy snacks will be more appealing at a well-defined time and place in the future than sated people who have just eaten (Gilbert et al., 2002; Read & van Leeuwen, 1998). In addition, men who are momentarily sexually aroused are more likely to say that they would engage in sexually aggressive behavior on a future date than men who are currently unaroused (Loewenstein, Nagin, & Paternoster, 1997). These empathy gaps in self-prediction occur even when people know, or should know, that their emotional states are transitory.

If people's predictions of others' feelings are based on their self-predictions, then these empathy gaps could produce social projection of transient drive states. Some support for this hypothesis comes from previous research, although that research did not examine people's predictions of how others would feel in situations that arouse drive states. Feshbach found that compared to participants in a control condition, participants who were experimentally induced to feel angry or anxious perceived more hostility and anxiety in stick figures, ambiguous pictures of people, or pictures of ambiguous dyadic interactions (Feshbach & Feshbach, 1963; Feshbach, Singer, & Feshbach, 1963). In our own lab, we found that people who did not currently own an object underestimated how much owners valued their object—just as they underestimated how much they themselves would value the object if they owned it (Van Boven et al., 2000, 2003). Of importance, these biased predictions of owners' valuation were statistically mediated by people's biased predictions of how valuable the mug would be to themselves if they were an owner.

The Present Studies

We report two studies that examine emotional perspective taking with respect to transient drive states. In

the first, exploratory study, we investigated whether people explicitly report using themselves as a basis for predicting how strangers would feel in a situation that arouses drive states, even when the situation is one that people are unlikely to have experienced themselves. In the second study, we investigated whether this strategy, coupled with empathy gaps in self-predictions, would lead people to socially project their transient drive states. Specifically, we examined whether people who, as a result of engaging in cardiovascular exercise, were temporarily thirstier and warmer than participants in a control condition would be more likely to predict that other people (and they themselves) would be more bothered by thirst than by hunger in a completely different situation.

STUDY 1: TRADING PLACES

We asked participants to consider the plight of three hikers on an Alaskan backcountry wilderness adventure who, by an unfortunate turn of events involving a bear, were forced to forego food for several days. We asked participants to spend a few minutes imagining how the hapless hikers felt and, afterward, to describe the strategies they used to take the hikers' perspective. We expected that most participants would report predicting the hikers' feelings by imagining how they themselves would feel in the hikers' situation.

Method

University students ($N = 39$; 30% male; M age = 20.87 years) completed the questionnaire in exchange for extra credit in their introductory marketing course. Participants were shown a picture of three, ruggedly handsome hikers (the two authors and Douglas Harsch) trudging through an Alaskan mountain meadow¹ accompanied by the following scenario:

Last July, Don, Doug, and George set out on a 12-day backpacking trip in the remote Alaskan wilderness (see picture). They set off in an area without trails, using only topographic maps and a compass as their guide. After 3 days, although they had not encountered any signs of humans, they had encountered plenty signs of bear and moose. On the morning of day 4, they awoke to discover that, during the night, a bear had eaten all of their food—every last bit of it! The hikers realized they were in trouble: Although there was an abundance of water, they had no way of obtaining more food—they had neither equipment for fishing nor guns for hunting. The hikers calculated that the shortest route back to civilization would take 4 days and would involve crossing a large glacier, traversing a raging river, and bushwhacking through a dense forest.

Participants were instructed to spend at least 2 min estimating what the hikers were thinking and feeling on the 2nd day of their return ordeal, after not eating for 2 days.

Participants were then asked to describe in as much detail as possible and in their own words the “processes and strategies you used to imagine what the hikers were feeling and thinking.” They were provided with 10 lines on which to write their description.

Participants were next directly asked, “When you took the hikers’ perspective, did you try to mentally trade places with them, imagining what your own thoughts and feelings would be if you were in their shoes?” which they answered by selecting either “Yes” or “No.” Participants then rated the extent to which they imagined what their own thoughts and feelings would be in the hikers’ situation on a scale ranging from (0) *not at all* to (6) *a great deal*. Finally, participants were asked to indicate their ethnicity (74% Asian, 21% European, 5% other) and to specify which of the following activities they had ever engaged in: backpacking, mountaineering, hiking, and other outdoor/wilderness activities (which they were asked to specify). After completing these items, participants were thanked and debriefed.

Results and Discussion

Age, ethnicity, and gender did not affect any of the analysis in this study and are not further discussed.

Our primary analysis concerned participants’ reports of how they estimated the hikers’ thoughts and feelings. To examine participants’ open-ended descriptions of their perspective-taking strategies, two research assistants (both of whom were unaware of our hypothesis) read and coded the open-ended descriptions. They coded three dichotomous variables: (a) whether participants explicitly stated imagining how they would feel in the hikers’ situation, (b) whether participants mentioned themselves before mentioning the hikers, which we assumed would reflect the relative accessibility of thoughts about themselves versus thoughts about the hikers, and (3) whether participants referred to a memory or similar experience (“I was really hungry when I went hiking last summer”). Across the three variables, the two coders agreed in 90% of the cases; disagreements were resolved through discussion with the first author.

As expected, the majority of participants (79%, 95% confidence interval = 64%-91%) explicitly referred to mentally trading places with the hikers and imagining how they would feel in their situation. Participants were also more likely to mention themselves before mentioning the hikers ($M = 69%$), $\chi^2(1, N = 39) = 5.77, p < .025$. Only half of participants (49%, 95% confidence interval

= 32%-65%) referred to a memory of how they felt in a similar situation.

When participants were directly asked whether they mentally traded places, a clear majority (87%, 95% confidence interval = 73%-96%) said they did. Furthermore, participants’ rating of how much they relied on trading places was very close to the high end of the scale ($M = 4.94$ out of 6, 95% confidence interval = 4.70-5.30).

Not surprisingly, no participant reported having been in a highly similar situation, that is, being lost in the wilderness for several days without food. Most participants (82%) did, however, report at least one type of similar experience: 21% had been mountaineering, 26% had been backpacking, 77% had been hiking, and 44% had engaged in some other type of outdoor activity (i.e., biking, boating, camping, skiing, or snowboarding). Participants who reported at least one kind of similar experience were more likely to report mentally trading places in their open-ended descriptions (85%), in the forced choice measure (91%), and in their rating of how much they mentally traded places ($M = 5.15$) compared to participants who did not mention any kind of similar experience (50%, 67%, and $M = 4.00$, respectively). This difference was reliable for the open-ended descriptions, $\chi^2(1, N = 39) = 3.78, p = .05$, marginally reliable for the forced choice measure, $\chi^2(1, N = 39) = 2.67, p = .10$, and reliable for the rating measure, $t(37) = 2.66, p < .05$.² Much caution should be used in interpreting the association between reports of similar experiences and reports of mentally trading places. We speculate that this association reflects the fact that people who perceive themselves to have similar experiences are more likely to utilize mentally trading places than those who do not perceive themselves as having similar experiences.

These results are consistent with our hypothesis that people often rely on mentally trading places to predict the feelings of other people who are in a situation that arouses drive states. Because participants in this study were predicting the feelings of strangers—people about whom participants had limited information—mentally trading places may have been the best, if not the only, available alternative. We briefly return to this issue in the General Discussion.

If people base their predictions of others’ feelings on their self-predictions (the horizontal solid arrow in Figure 1), then people’s predictions of others’ feelings will be influenced by their predictions of their own feelings (the vertical solid arrow in Figure 1). Of course, the accuracy of people’s self-reports of their own mental processes leaves much to be desired (Nisbett & Wilson, 1977). In Study 2, we therefore wished to put people’s self-reports “to the test” and examine the association between people’s predictions of their own and other

people's feelings and whether people would project temporarily aroused drive states onto other people.

STUDY 2: LET'S GET PHYSICAL

Participants were asked to predict the feelings of people who were in a situation that aroused drive states: hikers (again) lost in the woods, with neither food nor water. Participants made these predictions either immediately before or immediately after engaging in vigorous cardiovascular exercise for at least 20 min, which we expected would make participants thirsty and warm. We assumed that participants would be aware that they were about to or had just engaged in an activity that would make them thirsty and warm. We also asked participants to predict how they would feel if they were in the hikers' situation.

We predicted, first, that participants' thirst and warmth would influence their prediction of how they would feel in the hikers' situation: Participants who had just exercised would anticipate feeling more bothered by thirst compared to participants who had not exercised. We predicted, second, that participants would project their thirst onto the lost hikers. That is, we expected that participants who had just exercised would predict that the hikers would be more bothered by thirst than would participants who were about to, but had not yet, exercised. Our final prediction was that because participants use their self-predictions as a basis for predicting others, the effect of participants' thirst on self-predictions would statistically mediate the effect of their thirst on social predictions.

Method

One of two experimenters who were unaware of the hypotheses approached university students, faculty, and staff as they entered a campus exercise facility and asked them if they intended to engage in "vigorous cardiovascular exercise" for at least 20 min. If they were going to exercise, they were asked whether they would be willing to complete a short (i.e., 10 min) survey in exchange for a noncarbonated bottle of water that they would receive after completing the survey. We expected that offering bottled water as an incentive for completing the survey and making participants aware of the timing manipulation (i.e., whether participants were completing the survey before or after exercising) would heighten their sensitivity to the effect of exercise on their thirst. Stationary bicycle riding, rowing, and stepping on stationary exercise machines were provided as examples of cardiovascular exercise; participants' activities were roughly equally divided among the three.

To qualify for participation, participants had to agree to complete the survey before they knew whether they would complete it before or after exercising. Forty-seven people (of approximately 60 who were initially approached) agreed to complete the questionnaire (40% male; M age = 21.3 years) and were randomly assigned to complete the questionnaire either immediately before or immediately after exercising.

The questionnaire described the plight of three hikers lost in the woods:

Imagine that three vacationers in Colorado this past August embarked on a short, 6-mile hike. In the early afternoon, a sudden dry-lightning storm caused them to run into the shelter of a densely forested area. After the storm passed, they searched for the trail but could not find it. As the day wore on, they realized that they were hopelessly lost and had no idea how to find their way out of the wilderness. Worse, because they had packed lightly for a short hike, they had not carried much in the way of food or water. As night fell, the three hikers found themselves in dire straights: They had no food and no water.

After reading this description, participants were asked to describe the hikers' feelings, both physically and mentally. Participants were provided with a half page of blank space on which to write their description.

Participants next made explicit predictions of the hikers' feelings and of what their own feelings would be if they were in the hikers' situation. They were asked, "Which would be more unpleasant [to you] for the hikers, hunger or thirst?" which they answered by circling either "hunger" or "thirst." They were also asked, "Which would [you] the hikers regret not packing more, extra water or extra food?" which they answered by circling either "extra water" or "extra food." The order of the two questions regarding the hikers' feelings and the two questions regarding participants' own feelings was counterbalanced and there was no effect of order in any of our analyses.

Participants then answered several questions about their current visceral feelings. They indicated on three separate 9-point scales how hungry, thirsty, and warm they felt "right now." The scales were anchored at *not [hungry, thirsty, and warm]* (1) and *extremely [hungry, thirsty, and warm]* (9). We expected that exercising would arouse participants' thirst and warmth. We did not expect exercise to affect participants' hunger. Last, participants reported how many times they exercised each week ($M = 3.71$ times), how long they had been exercising regularly ($M = 3.92$ years), and whether they were currently dieting (33% were).

Results

The frequency and duration of regular exercise did not differ by condition, and neither variable significantly altered the overall pattern of results. Unexpectedly, female participants who had just exercised were more likely to indicate that they were currently dieting (71%) than were female participants who had not exercised (29%), $\chi^2(1, N = 27) = 4.64, p < .05$. Male participants' dieting claims did not differ by condition, $\chi^2 = .95, ns$. Although intriguing, this result does not pertain directly to the present study, and statistically controlling for it did not significantly affect any of our analyses.

Manipulation check. As intended, participants who just exercised felt significantly thirstier ($M = 6.88$) and warmer ($M = 6.92$) than participants who had not exercised ($M_s = 3.65$ and 4.87 , respectively), $t_s(45) = 3.05$ and 4.37 , respectively, both $p_s < .05$. Exercise did not significantly affect participants' feelings of hunger, $t < 1$.

Self-predictions. We first examined whether participants' predictions of how they would feel in the hikers' situation were influenced by their current thirst. As expected, participants who had just exercised were more likely to predict that they themselves would be more bothered by thirst compared to participants who were about to exercise, $\chi^2(1, N = 47) = 6.21, p < .05$ (see the left side of Figure 2). Participants who had just exercised were also more likely to predict that they would regret not bringing water compared to participants who were about to exercise, $\chi^2(1, N = 47) = 4.38, p < .05$.

Social predictions. We next examined whether predictions of how the lost hikers felt were influenced by participants' exercise-induced thirst. As expected, participants who had just exercised were more likely to predict that the hikers would be more bothered by thirst compared to participants who were about to exercise, $\chi^2(1, N = 47) = 5.63, p < .025$ (see the right side of Figure 2). Participants who had just exercised were also more likely to predict that the hikers would regret not bringing water compared to participants who were about to exercise, $\chi^2(1, N = 47) = 9.16, p < .025$. Also in line with our hypothesis, when participants described how they thought the lost hikers felt, those who had just exercised were more likely to mention only thirst (30%) than participants who had not exercised (9%), although the difference was only marginally reliable, $\chi^2(1, N = 47) = 3.18, p = .075$.³ (There was no difference in the proportion of participants who mentioned only hunger, $p = .48$.) Participants thus projected their thirst onto the lost hikers.⁴

Paths of projection. Our hypotheses, as represented by the two solid arrows in Figure 1, specify a causal path in which exercising arouses participants' thirst, which influences their self-predictions, which, in turn,

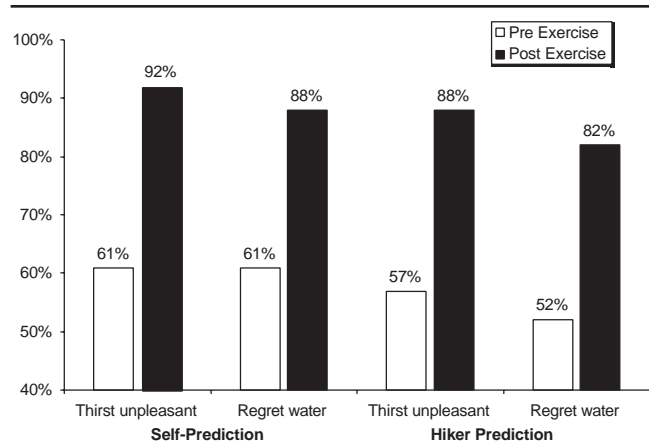


Figure 2 Percentage of participants before and after exercising indicating that they and the lost hikers would be more bothered by thirst than hunger and would regret not bringing water more than food.

influence their predictions of the lost hikers' feelings. This analysis implies two mediational paths. First, people's self-reported feelings of hunger, thirst, and warmth—which we assume are reliable, if imperfect, indicators of participants' drive states—should statistically mediate the effect of exercise on their self-predictions. Second, participants' self-predictions should statistically mediate the effect of exercise on their predictions of the lost hikers' feelings. We examined these predictions simultaneously using structural equation modeling (SEM).

To simplify analyses, we averaged participants' two self-predictions and their two predictions of the lost hikers into two composite variables: one for self-predictions and one for hiker predictions. Each prediction was coded "1" if participants predicted that the hikers (or themselves) would be more bothered by thirst than hunger and if they predicted the hikers (or themselves) would regret not bringing water more than not bringing food and "0" if participants' predictions were the reverse. The two composite scores thus ranged from 0 to .5 to 1; higher values mean that participants expected the hikers (or themselves) to be more bothered by thirst than hunger. We also combined participants' ratings of their current thirst and warmth into a composite measure called "thirsty and warm"; the two measures were highly correlated, $r = .69$, and as described earlier, were similarly affected by the exercise manipulation.

We used the SEM program within the AMOS procedure (Arbuckle & Wothke, 1999). Significant and nonsignificant associations in the model, controlling for all other associations, are represented by the solid and dashed arrows, respectively in Figure 3. The overall pattern of associations confirms our two mediational predictions.⁵ Consider first participants' self-predictions. Exercise was positively associated with participants

feeling thirsty and warm, $Z = 4.22, p < .001$. Participants' combined feelings of thirst and warmth were positively associated with, and their feeling of hunger was negatively associated with, their self-predictions, $Zs = 3.56$ and -2.92 , respectively, both $ps < .01$. Importantly, the association between exercise and participants' self-predictions was not reliable, $Z < 1$. The effect of exercise on participants' drive states thus statistically mediated the effect of exercise on their predictions of how they would feel if they were in the hikers' situation.

Next, consider participants' predictions of the lost hikers' feelings. Participants' self-predictions were the only reliable predictor of their predictions of the hikers' feelings, $Z = 5.54, p < .001$. Neither the exercise manipulation nor participants' self-reported feelings were reliably associated with their predictions of the hikers' feelings, both $Zs < 1$. The (indirect) effect of exercise on participants' self-predictions thus statistically mediates the effect of exercise on participants' predictions of the hikers' feelings.

Figure 4 presents the restricted model implied by our analysis. The six nonsignificant paths from the fully saturated model have been set to zero. We included the association between hunger and self-predictions even though the exercise manipulation did not affect participants' self-reported hunger because our hypothesis was that drive states would influence participants' self-predictions regardless of whether those states were affected by the exercise manipulation. All of the paths in the restricted model are significant, all $Zs > 2.78$, all $ps < .01$, and the model fits the data well (goodness of fit index = .95; comparative fit index = 1.00). Furthermore, the fully saturated model (Figure 3) does not fit the data significantly better than the restricted model (Figure 4), $\chi^2(6, N = 47) = 5.92, p = .43$.

Conclusion

These results indicate that people project their transient drive states when predicting how they themselves and how other people would feel in a situation that arouses drive states. These results—the SEM analysis in particular—provide strong support for our hypothesis that people's predictions of others' feelings are based on their predictions of their own feelings. This projection of drive states occurred even though participants probably knew that exercising would make them temporarily thirsty.

GENERAL DISCUSSION

Drive states pervade human experience. On a daily basis, people move in and out of variously intense hunger, thirst, warmth, lust, fear, and so on. Because individuals interact frequently with other people who are in different states than themselves, predicting how they feel is

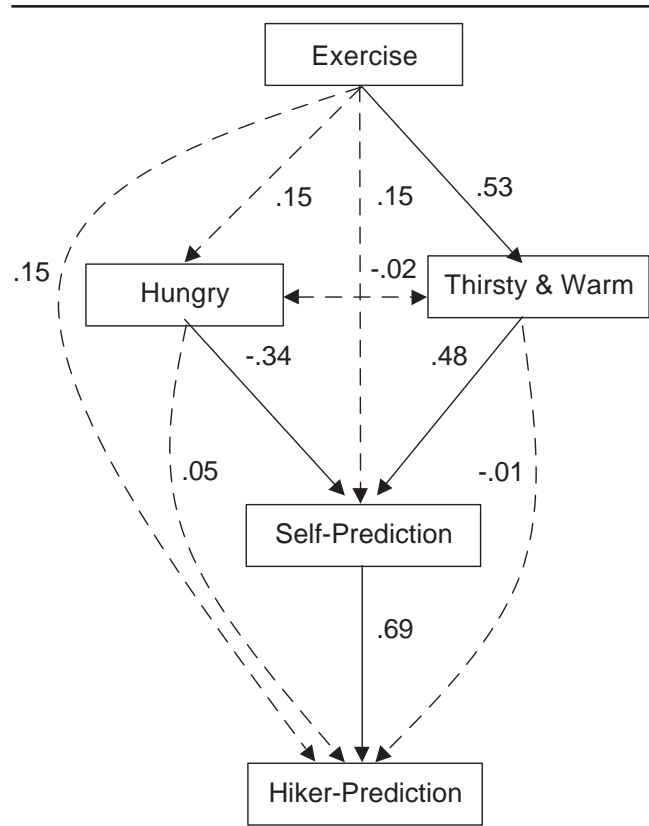


Figure 3 Fully saturated structural equation model estimating participants' predictions of the lost hikers' feelings.

NOTE: Solid lines represent significant associations ($ps < .05$), dashed lines represent nonsignificant associations, each controlling for all other associations in the model. Numbers are standardized regression weights.

important. The present research suggests that such predictions often are made egocentrically: Individuals predict how other people feel by imagining how they themselves would feel in their situation. Because people experience empathy gaps in self-predictions, projecting their current drives onto predictions of how they would feel in a different situation, this perspective-taking strategy results in social projection of transient drive states.

We suspect that the same psychological processes underlying projection of drive states characterize emotional perspective taking generally. That is, people's predictions of another person's feelings, preferences, and behaviors are likely to be based on people's predictions of what their own feelings, preferences, and behaviors would be in the other person's situation (Van Boven, Loewenstein, & Dunning, 2003). We have found, for example, that people's predictions of other people's willingness to engage in potentially embarrassing public performances are strongly influenced by their own willingness to perform, which, in turn, is strongly influenced by their momentary feelings of fear and anxiety (Van Boven, Loewenstein, Welch, & Dunning, 2003). Our

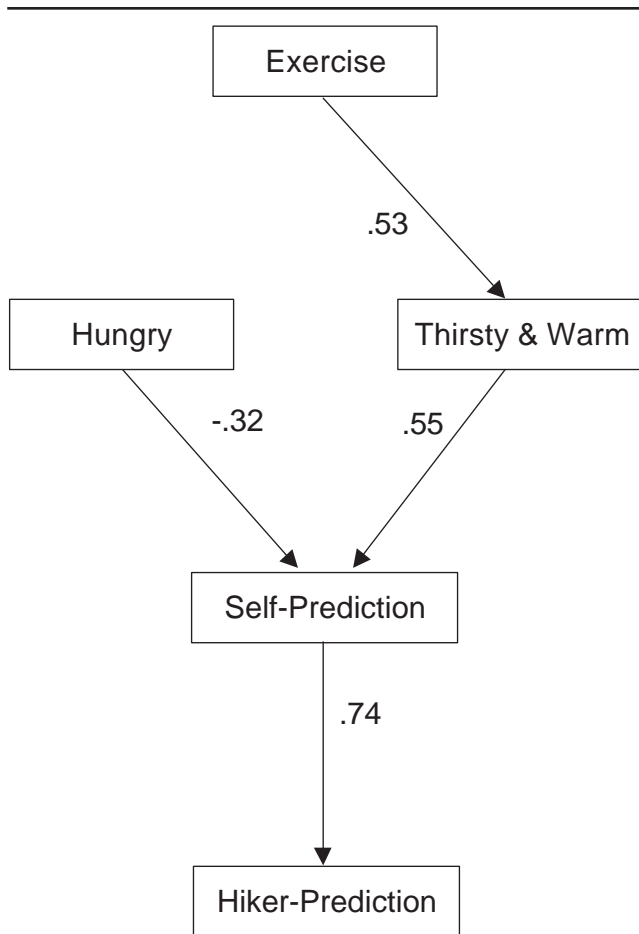


Figure 4 Restricted SES model estimating participants' predictions of the lost hikers' feelings.

NOTE: Numbers are standardized regression weights, which are all significantly different from 0 ($p < .01$), controlling for all other associations in the model.

analysis of emotional perspective taking suggests both that people tend to project their momentarily aroused, "hot" emotional states onto others and that people in unaroused, "cold" states tend to underestimate the impact of emotions on themselves and other people. Indeed, in the research involving public performances, we found that people who were not feeling fearful and anxious overestimated other people's and their own willingness to perform publicly to a greater degree than people who were feeling fearful and anxious.

Of course, mentally trading places is not the only strategy people can use to predict others' feelings. They also might utilize personal knowledge of others' motivational dispositions ("Anna is always hungry"). They may have intuitions about how people feel in specific situations ("sitting in the sauna makes you hot and thirsty"), or they may observe diagnostic cues to an individual's feelings ("those dark circles must mean that he's tired"), but mentally trading places often may be the best way to

predict others' feelings, especially when people make predictions about strangers about whom they have limited personal knowledge, intuitions, and observations (cf. Dawes, 1989; Hoch, 1987). Moreover, even when people have such information, they may nevertheless begin by predicting themselves and then adjusting for other information ("I would be thirstier if I lost my food and water, but since Anna's always hungry, she'd be hungrier").

Mechanisms Underlying Empathy Gaps in Self-Prediction

What causes empathy gaps in self-predictions? The existing literature points to at least two underlying mechanisms. First, emotions and motivations can influence people's construal of what situations are about. According to Bower's (1981) emotion-congruence model, being in an emotional state activates the emotion's unit in memory; that activation then spreads to related units, influencing ongoing mental processes. Information is therefore better learned, recalled, and perceived when it is congruent rather than incongruent with an emotional state. Participants in one study, for example, were placed in a happy, sad, or neutral state (Niedenthal, Halberstadt, & Setterlund, 1997). In a series of word/nonword lexical decisions, participants were quicker to recognize emotionally congruent words than emotionally incongruent words (also see Hansen & Shantz, 1995; Niedenthal & Setterlund, 1994). Because people are naive realists, experiencing their perceptions as largely unbiased responses to the situations they encounter (Griffin & Ross, 1991; L. Ross & Ward, 1995), they are unlikely to appreciate the extent to which their current emotional state shapes their construal by increasing the mental accessibility of affectively congruent information.

The second reason why people may experience empathy gaps in self-predictions is that their current feelings may serve as a judgmental anchor from which people adjust to account for how they would feel differently in a different situation (Gilbert et al., 2002; Gilbert & Gill, 2000). Because such adjustments tend to be insufficient (Jacowitz & Kahneman, 1995; Tversky & Kahneman, 1974), and because evidence that adjustment is insufficient is seldom directly observable (Wilson & Brekke, 1994), people are likely to underestimate how differently they would feel in a different situation.

Are Drives Unique?

We have shown that people project their transient emotional states onto predictions of how other people would feel in different situations. An analogous pattern of results has been observed with respect to knowledge. Individuals who possess private information (such as the intended meaning of a communication) project that knowledge onto uninformed people, crediting them with

more knowledge than they have (Camerer, Loewenstein, & Weber, 1989; Keysar, Ginzler, & Bazerman, 1995; Nickerson, 1999). Do the processes underlying social projection of emotional states differ from the processes underlying social projection of private information?

We suspect there is some overlap among the underlying processes but that they differ in at least two important respects. First, learning about someone who is in an emotionally arousing situation can automatically arouse empathic feelings (Hodges & Wegner, 1997). These feelings may encourage and facilitate predicting others' feelings by mentally trading places. Learning about someone in a different state of knowledge seems less likely to automatically arouse such empathic processes. Second, and more speculatively, emotional states in general and drive states in particular may influence mental accessibility more than private information. Projection of drives may therefore be more robust than projection of information. Whether projection of drives differs fundamentally from the projection of information is an important question for future research.

Attributional and Behavioral Implications

The tendency to project one's own emotional state onto others may be an important source of biased explanations for others' behavior. People use their own behaviors as norms when evaluating and explaining others' behavior (Dunning & Cohen, 1992; Dunning & Hayes, 1996). Because people tend to underestimate how differently they would feel and behave in different emotionally arousing situations, these "egocentric comparisons" may lead people to misinterpret the behavior of people who are actually in those situations (Van Boven et al., 2000). As Adam Smith (1759/2000) noted, "we either approve or disapprove of the conduct of another man, according as we feel that, when we bring his case home to ourselves, we either can or cannot entirely sympathize with the sentiments and motives which directed it" (p. 160). People in unemotional, cold states may be especially likely to misattribute the behavior of other people who are in emotionally arousing situations to their underlying dispositions rather than to their situationally induced emotions.

Such misinterpretations may be particularly pronounced and problematic when it comes to visceral states, with wide-ranging implications for everyday social life and public policy. People's tendency to punish others, for example, may be exacerbated because they cannot appreciate the power of visceral states to shape others' behavior. Drug policies may therefore focus too much on punishment and too little on treatment. Public health policies may focus too much on admonishing individuals to practice safe sex and too little on setting realistic expectations about the power of lust in the "heat

of the moment." And foreign policies directed at war-torn, impoverished nations may focus too much on military threats and economic sanctions and too little on food, medical, and economic aid.

Conclusion

Human interaction is enriched and complicated by our recognition, awareness, and anticipation that other people's thoughts and feelings are different from our own. Developmental psychologists, philosophers, and cognitive scientists have hotly debated the nature of this "folk psychology," including when, exactly, and in what forms humans acquire it. One view, the "theory-theory," is that people make sense of "other minds" by applying a general theory of the way minds work (Fodor, 1992; Gopnik & Wellman, 1992; Wimmer & Perner, 1983). Another view, the "simulation theory," is that people use themselves as a "source model," predicting others' thoughts and feelings by imagining themselves in the other person's situation (Goldman, 1993; Gordon, 1986). Although the present research does not resolve this debate, it lends credence to the simulation account. Social perception, it seems, is intricately linked with self-perception.

NOTES

1. The picture, taken by Don Moore, is available on request.
2. The specific type of similar personal experience was not associated with participants' tendency to report mentally trading places on any of the measures.
3. Statements that merely implied hunger or thirst ("The hikers probably would have killed for a candy bar") were coded as mentioning the implied feeling (hunger).
4. Note that because dehydration is more severe than hunger, thirstier participants' predictions of the hikers' feelings were probably more accurate than less thirsty participants' predictions.
5. It must be remembered that although structural equation modeling (SEM) requires specifying a causal relationship between two variables, as implied by the single-headed arrows, it actually assesses only the magnitude of the relationship between two variables, controlling for their relationship with other variables, and cannot measure causality. It does, however, allow an examination of whether one pattern of associations captures the data better than another pattern of associations.

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