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The rational side of egocentrism in social comparisons ☆

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Abstract

Prior work has found that when people compare themselves with others they egocentrically focus on their own strengths and achievements more than on the (equally relevant) strengths and achievements of the comparison group. As a consequence, people tend to overestimate their comparative standing when absolute standing is high and underestimate their comparative standing when absolute standing is low. The present research investigated a rational discounting explanation of this bias—namely, that people weight the target of the comparison (the self) more than the referent of the comparison (others) because they typically have more knowledge about the former than the latter. In three studies, we found that the tendency to focus on the target in social comparisons—and the over and underestimation of relative standing that tendency engenders—was reduced (but not eliminated) as people's knowledge about the comparison group increased. These results suggest that there may be a rational side to egocentrism in social comparisons.

Keywords: Social comparison; Egocentrism; Judgment and decision making; Self-assessment; Heuristics and biases; Self-enhancement; Unrealistic optimism; Above-average effect; Overconfidence

Social comparisons are ubiquitous. How does my health compare with that of the average person? How much have I contributed compared with my collaborator? How do I stack up against the competition?

Almost as ubiquitously, these judgments are associated with self-enhancement. People tend to overestimate their comparative strengths and achievements (e.g., Alicke, 1985; Dunning, Meyerowitz, & Holzberg, 1989; Myers, 1998). They are unrealistically optimistic about their comparative likelihood of experiencing the good things in life (Weinstein, 1980; Weinstein & Lachendro, 1982). They overestimate their role in collaborations (Kruger & Gilovich, 1999; Ross & Sicoly, 1979). And they are overconfident in competitions (Plous, 1993).

More recent work, however, suggests a more nuanced picture of self-enhancement in social comparison. For instance, although individuals overestimate their social standing in easy ability domains (such as driving a car or operating a computer mouse), they underestimate their social standing in more difficult domains (such as juggling or computer programming) (Burson, Larrick, & Klayman, 2006; Klar & Giladi, 1997; Kruger, 1999). As well, whereas people tend to overestimate their comparative likelihood of experiencing common desirable events (such as living past 70), they underestimate their comparative likelihood of experiencing rare desirable events (such as living past 100) (Chambers, Windschitl, & Suls, 2003; Kruger & Burrus, 2004). Similarly, although married couples overestimate their relative contribution to frequently-performed household chores (such as cleaning the dishes), they under-

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estimate their relative contribution to infrequently-performed household chores (such as cleaning the oven) (Kruger & Savitsky, 2006). And whereas competitors are overconfident about their chances of winning when faced with a "shared benefit" (a circumstance that benefits all competitors equally, such as "wildcards" in the game of poker), they are underconfident when faced with a shared adversity (Moore & Kim, 2003; Windschitl, Kruger, & Simms, 2003).

What accounts for these reversals? Prior work has suggested that when people compare themselves with others—be it in terms of their strengths and achievements, their likelihood of experiencing an event, their contribution to a collaboration, or their likelihood of winning a competition—they egocentrically focus on their own strengths/likelihood/contribution and underweight the strengths/likelihood/contribution of the comparison group. For instance, when people compare their driving ability with that of the average person, they tend to focus on their own driving ability more than the driving ability of the average person. Similarly, when married individuals estimate how much they have contributed to household chores compared with their spouse, they tend to focus on their own contribution to the task more than their spouse's contribution. And when people predict the outcome of a competition, they focus on their own strengths and weaknesses more than on the strengths and weaknesses of their opponent (Moore & Kim, 2003; Windschitl et al., 2003). As a consequence, individuals overestimate their relative standing when absolute strengths/likelihood/contributions are high and underestimate their relative standing when absolute strengths/likelihood/contributions are low (Burson et al., 2006; Chambers et al., 2003; Klar & Giladi, 1997; Kruger, 1999; Kruger & Burrus, 2004; Kruger & Savitsky, 2006; Moore & Kim, 2003; Windschitl et al., 2003).

Less clear, however, is the reason self versus other comparisons are egocentric. One possibility is that the mere act of comparing the self with others (as opposed to others with oneself) naturally focuses attention on the target of the comparison (the self) at the expense of the referent (others). This "focalism" explanation follows from (among other things) Tversky's (1972, 1977) work on judgments of similarity, the anchoring and adjustment heuristic (Chapman & Johnson, 2002; Epley & Gilovich, 2001; Tversky & Kahneman, 1974), and the more general finding that focal hypotheses tend to receive greater weight than non-focal hypotheses (Burrus & Kruger, 2006; Fox & Levav, 2000; Giladi & Klar, 2002; Kahneman & Tversky, 1982; Klayman & Ha, 1987; Kruger & Burrus, 2006; Lord, Lepper, & Preston, 1984; McKenzie, 1998; Rottenstreich & Tversky, 1997; Trope & Mackie, 1987; Tversky & Koehler, 1994; Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000). Consistent with this explanation, whereas roommates tend to overestimate their contribution to frequently performed tasks when they compare their own contribution with that of their roommate, this tendency is reduced when they compare their roommate's contribution with their own (Kruger & Savitsky, 2006; see also Ross & Sicoly, 1979, Experiment 5). Similarly, whereas competitors faced with a shared benefit are overconfident when they estimate their own chances of winning, they are less confident when they estimate their competitor's chances of winning (Moore & Kim, 2003; Windschitl et al., 2003).

Another possibility stems from the difference in accessibility between information pertaining to one's own strengths/likelihood/contributions versus those of the comparison group. A large body of work suggests that self-related information is more spontaneously and efficiently retrieved than is other-related information (Kuiper & Rogers, 1979; Markus, 1977; Ross & Sicoly, 1979; Srull & Gaelick, 1983). As such, all else equal, it is easier to think of one's own strengths and achievements than it is to think of the strengths and achievements of the comparison group. Consistent with this explanation, manipulations of the relative salience of self vs. other-related information influence the extent to which individuals are egocentric in their social comparisons. For instance, in one study participants were less confident about their chances of beating a competitor in a futuristic videogame when both were asked to wear blindfolds (a circumstance which would impair the performance of both competitors equally)—the typical egocentrism effect. However, that tendency was reduced when the salience of one's competitor's circumstance was increased (such as by placing him or her in the same room as the subject) (Chambers & Kruger, 2006).

Unexamined, however, is another, perhaps more parsimonious explanation for egocentrism in social comparison. Rather than focalism or differences in information *salience* leading to egocentrism, it may be that differences in information *availability* account for the effect, that is, differences in the amount of knowledge people have about themselves versus the comparison group (Chambers & Windschitl, 2004). After all, people have considerably more information about themselves than they do about others. Whereas one's own computer programming ability (or lack thereof) is painfully apparent, for instance, the computer programming prowess of "the average person" is at best an educated guess. As well, although one might have a reasonably good idea of how many times one's spouse has done the dishes, the reliability of that estimate likely pales in comparison with the reliability of one's estimate of one's own dishwashing.

This difference in knowledge suggests that the tendency to focus on oneself when comparing oneself with others (and the various biases that tendency engenders) may in part reflect a rational discounting procedure. If one has more (and more accurate) knowledge about one's own ability, future, or contribution than about the absolute ability, future, or contribution of others, then it may be quite sensible for one to focus on the former (what one knows) more than the latter (what one doesn't know) when comparing the two. Consider the task of predicting the outcome of a trivia contest between oneself and a randomly selected other on the topic of Mesopotamian history. Suppose

one is certain of one's own knowledge (or lack thereof) and considerably less certain of the knowledge possessed by a randomly chosen other on the subject. If so, then it may be rational to focus on one's own knowledge more than one's estimate of the knowledge possessed by one's competitor when predicting the outcome of a trivia contest between the two (as participants in Windschitl et al. (2003) did). As a result, the tendency observed for the majority of participants to believe that they would lose such a contest—though demonstratively false (only half of participants lost, of course, by necessity)—might nevertheless have been sensible if the only reliable information participants had was about their own knowledge.

Paradoxically, this underestimation might even occur in the absence of any systematic tendency to rate one's own knowledge differently than one's competitor's knowledge (although such a tendency is certainly *sufficient* to produce such underestimation, see Moore & Small (in press) for a recent empirical example). Consider once again a rational agent in a trivia contest between herself and a randomly selected individual on the subject of Mesopotamian history. If she is certain of her own lack of knowledge but uncertain of the knowledge of her competitor, then focusing on what she knows and discounting what she doesn't may lead her to the conclusion that she will probably lose. However, when she is prompted to explicitly consider the knowledge possessed by a randomly chosen other, it is not necessarily the case that she provide a knowledge estimate that is any different from her own. After all, there is no shortage of studies that attest to the tendency of individuals to use their own knowledge as a basis for their estimate of the knowledge of others (Krueger & Clement, 1994; Ross, Greene, & House, 1977)—nor even any shortage of arguments for the normative basis of that tendency (Dawes, 1989; Hoch, 1987). As a result, she may very well provide a peer-knowledge estimate that is similar to her self knowledge-estimate, and yet at the same time expect that she will lose. Most paradoxical of all, both judgments—though internally inconsistent—could even be justified.

The present research was designed to test this rational discounting interpretation of egocentrism in social comparisons. In Study 1, participants estimated their relative engagement in a series of activities about which they had either minimal or substantial knowledge about the comparison group's actions. In Study 2, participants made likelihood judgments about the outcome of a competition between someone they knew well versus someone they did not know well. In Study 3, participants indicated their confidence that an army they were hypothetically commanding would be victorious over another army about which they were given small or large amounts of information. In each case, we predicted that as the knowledge people had about the comparison group varied, so too would the weight assigned to that comparison group when making comparative judgments. Specifically, we predicted that as the gap between participants' knowledge of the target and referent of the comparison decreased, so too would the tendency to focus on the former more than the latter—as well as the over- and underestimation of relative standing that tendency engenders.

Study 1: Activities

Participants in our first study compared their engagement in a variety of activities with that of the typical person. Some of the activities were common (e.g., thinking about a loved one, wearing denim jeans) and others were rare (e.g., thinking about death, wearing a denim hat). If when people compare their own engagement in activities with that of the average person they focus more on the former than the latter, then participants should tend to overestimate their relative engagement in the common activities and underestimate their relative engagement in the rare activities—consistent with prior work (Kruger & Savitsky, 2006).

To explore the rational discounting explanation of this effect, we varied not only the rarity of the activities but the observability of them as well; that is, the extent to which people's engagement in the activity can be easily observed by others. If people focus on their own more than the average person's engagement in part because they simply know more about the former than about the latter, then that tendency ought to be reduced for public activities in which the actions of others are easily observable. Whereas participants might overestimate their comparative engagement in the private common activities such as "thinking about a loved one" or "checking the weather forecast," that tendency should be reduced for the more public common activities of "wearing denim jeans" and "waiting in line." Similarly, whereas participants might underestimate their relative engagement in private rare activities such as "thinking about death" or "taking a bubble bath," this tendency should be reduced for rare activities that are more public, such as "wearing a denim hat" or "throwing a dinner party."

Method

Participants

Thirty-five New York University undergraduate students enrolled in an introductory marketing course earned partial course credit for participating.

Procedure

Participants were given a list of 40 activities. For each one, they estimated how much they engage in the activity in comparison with the typical NYU student of their same age and sex on a scale from −4 (*I engage in this activity less than the typical NYU student*) to 0 (*I engage in this activity the same as the typical NYU student*) to +4 (*I engage in this activity more than the typical NYU student*). Next, participants provided separate estimates of their own and the typical student's engagement in the activities on a scale from 0 (*don't [doesn't] do this activity at all*) to 5 (*do [does] this*

activity a lot), as well as their confidence in each estimate on a scale from 0 (*I have no idea/I am just guessing*) to 5 (*I am pretty certain*) scale. Half of the participants rated themselves and then the typical student, the other half rated the typical student and then themselves.

Half of the activities were common and half were rare, and (orthogonally) half were public and half were private (see Appendix A). These categorizations were verified by a separate group of 85 participants drawn from a similar sample who rated either (1) the observability of each activity on a scale from −4 (*this activity is private/it's hard to tell whether someone has engaged in the activity*) to +4 (*this activity is public/it's very easy to tell whether someone has engaged in the activity*) ($n = 21$) or (2) their own personal engagement in the activity on a scale from 0 (*I don't do this activity at all*) to 5 (*I do this activity a lot*) ($n = 64$). As expected, participants reported engaging in the common activities ($M = 3.60$, $SD = 0.74$) far more than the rare activities ($M = 1.81$, $SD = 0.47$), paired $t(63) = 23.41$, $p < .001$, and the public activities were rated as considerably more noticeable ($M = 1.99$, $SD = 0.95$) than the private activities ($M = -0.59$, $SD = 1.60$), paired $t(20) = 9.12$, $p < .001$.[1]

Results and discussion

Our prediction was that participants would tend to overestimate their relative engagement in the common activities and underestimate their relative engagement in the rare activities, but that this effect would be larger for the private activities than the public activities. We tested this prediction by averaging the comparative ratings across the 10 activities within each category and then comparing these averages in a 2 (rare vs. common) × 2 (private vs. public) fully within-subject analysis of variance (ANOVA). As expected, we observed a large main effect for rarity: On average, participants thought that they engaged in the common activities more than the typical person ($M = 0.94$, $SD = 0.84$) and the rare activities less than the typical person ($M = -.91$, $SD = 0.98$), $F(1, 34) = 63.20$, $p < .001$, $\eta^2 = .65$. Each of these means were significantly different from zero, ts > 5, ps < .001. However, as the interaction depicted in Table 1 shows, this effect was smaller for the public than the private activities, $F(1, 34) = 6.01$, $p = .019$, $\eta^2 = .15$.

What caused this reduction? Our thesis was that people are more confident in their knowledge of the typical person's engagement in public activities than in private activities. Consequently, they are less likely to focus merely on their own level of engagement when making a direct comparison. To examine the first part of this assertion, we compared participants' confidence ratings in a 2 (rating: own vs. typical person) × 2 (activity: public vs. private) fully within-subject ANOVA. Not surprisingly, we found a main effect for target; participants were considerably more confident in their assessments of their own engagement ($M = 4.16$, $SD = 1.02$) than in their assessments of the typical person's engagement ($M = 2.74$, $SD = 1.21$), $F(1, 33) = 39.76$, $p < .001$, $\eta^2 = .55$. A second main effect revealed that participants were generally more confident in assessing engagement in the public activities ($M = 3.55$, $SD = 0.90$) than in the private activities ($M = 3.31$, $SD = 0.90$), $F(1, 33) = 29.19$, $p < .001$, $\eta^2 = .47$. But most important, we also obtained the expected interaction, $F(1, 33) = 14.20$, $p < .001$, $\eta^2 = .30$, indicating that the self-other confidence difference was bigger for the private activities (Ms = 4.10 vs. 2.52, SDs = 1.04 and 1.20) than the public activities (Ms = 4.23 vs. 2.89, SDs = 1.02, 1.25).

Table 1
Mean comparative activity estimates by activity rarity and observability, Study 1

Event rarity	Activity observability			
	Private		Public	
	M	*SD*	*M*	*SD*
Rare	−0.91	1.03	−0.91	1.19
Common	1.23	0.88	0.65	1.02

Did these differences in confidence also translate into differences in the weights assigned to self-knowledge and other-knowledge when making the comparative estimates? That is, was the tendency for participants to focus on their own rather than the typical person's engagement in the activities greater for private activities (where the self-other confidence gap was larger) than for the public activities (where the confidence gap was smaller)? To find out, for each participant we computed a path analysis using multiple regression predicting participants' comparative ratings from their ratings of their own engagement in the activities and (simultaneously) their ratings of the typical person's engagement in the activities. This was done separately for the observable and unobservable activities. The standardized betas from these analyses were then compared in a 2 (self vs. typical person) × 2 (private vs. public) ANOVA to see the extent to which participants' comparative estimates were predicted by their estimates of their own engagement or their estimates of the typical person's engagement (see Kruger & Burrus, 2004; Windschitl et al., 2003; for a similar analysis involving social comparisons of risk and competitive strength, respectively).

The results of that analysis are depicted in Fig. 1. As can be seen, when participants compared their own engagement in the activities with that of the typical person, they tended to focus more on the former than on the latter,

[1] We also asked a subset of these participants ($n = 21$) to evaluate the desirability of each activity on a scale from −4 (*this activity is undesirable/reflects negatively on the person who does it*) to 0 (*this activity is neutral/reflects neither positively nor negatively on the person who does it*) to +4 (*this activity is desirable/reflects positively on the person who does it*) in order to ensure that the rarity and observability of the activities were not confounded with desirability. Correlating the mean observability, rarity, and desirability ratings across the 40 activities revealed no confounds (all rs < .15, *ns*).

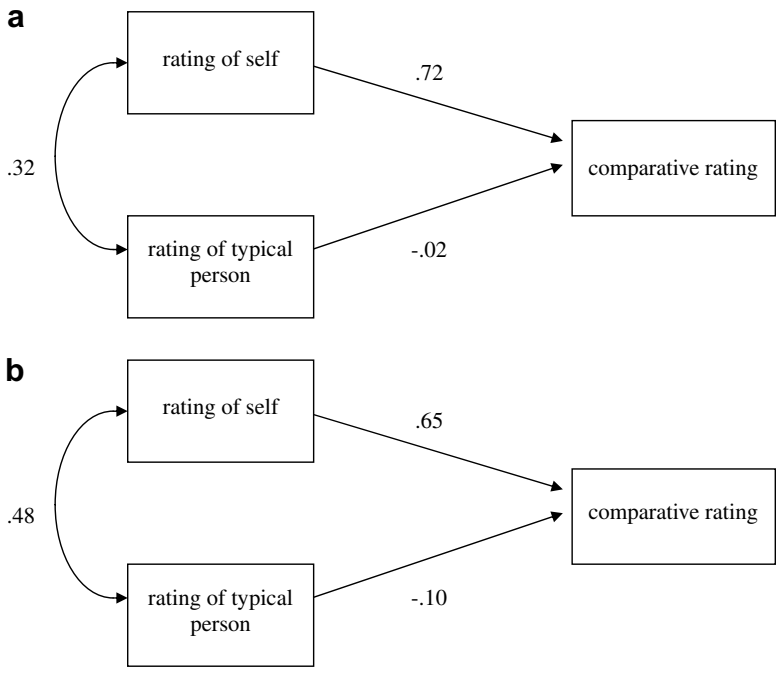

Fig. 1. For each participant, a path analysis was conducted predicting his/her comparative judgments from his/her ratings of the self and the typical person ratings, respectively. This figure shows the average values from these path-analyses. Average standardized betas appear on the straight arrows. Average correlations appear on curved arrows. (a) The average values from path-analyses for the private activities. (b) The average values from path-analyses for the public activities.

$F(1,32) = 172.88$, $p < .001$, $\eta^2 = .84$. An interaction revealed that that tendency was reduced, however, when the activities were public (and hence easily observable) versus when they were private, $F(1,32) = 13.57$, $p = .001$, $\eta^2 = .30$.[2]

The results of Study 1 provide initial support for our rational discounting account of egocentrism in social comparisons. Consistent with prior work, when participants compared their own engagement in an activity with that of the typical person, they focused more on the former than on the latter (Kruger & Savitsky, 2006). However, that tendency was reduced when the activities of others were easily observable. As a consequence, whereas participants tended to believe that they engaged in the common activities more than the typical person and the rare activities less than typical person when the activities were private (where knowledge of others' activities was low), that tendency was reduced when the activities were public (where knowledge of others' activities was high).

Study 2: Predictions in competitions

Study 2 was designed to provide additional support for our rational discounting explanation of egocentrism in social comparisons and to extend the results to an additional domain of social comparison. That domain was competition.

Prior work has found that when people estimate their likelihood of winning a competition, they egocentrically focus on their own strengths and weaknesses more than on the strengths and weaknesses of their competitor. As a consequence, people tend to be more optimistic about their chances of winning an easy competition than a difficult one—despite the fact that the ease or difficulty of the competition applies to all competitors (Moore & Kim, 2003; Windschitl et al., 2003).

For instance, in one study, college students estimated their chances of beating a fellow college student in several rounds of a trivia contest (Windschitl et al., 2003, Study 3). Some of the rounds involved easy trivia categories (e.g., Rock 'n Roll), whereas others involved difficult trivia categories (e.g., History of Mesopotamia). As expected, participants were more confident about winning the easy trivia categories than the difficult categories. A follow-up study revealed that this was because participants based their predictions more on their estimate of their own knowledge of the trivia category than on their estimate of their competitor's knowledge of the category (Windschitl et al., 2003, Study 4).

To test the rational discounting interpretation of this effect, we conducted a replication of the trivia paradigm used in Windschitl et al. (2003)—but with a twist. Instead of predicting the outcome of a competition between themselves and another individual, participants predicted the outcome of a competition between two other individuals:

[2] We used the inverse of the beta in order to enable an appropriate comparison. The degrees of freedom vary in this and in the next study because not all participants answered all of the questions.

one individual they knew well and one individual they did not know well. To the extent that people focus more on their own strengths and weaknesses than on the strengths and weakness of their competitor in part because they simply know more about the former than the latter, we should observe an analogous tendency here. Specifically, in a competition between a familiar and an unfamiliar other, participants should tend to focus more on the strengths and weaknesses of the person they know well. As a consequence, when the contest is simple (e.g., Rock 'n Roll), participants should expect the person they know to emerge victorious, but when the contest is more difficult (e.g., History of Mesopotamia), they should expect the person they know well to lose.

Method

Participants

The participants were 32 students from Elementary Psychology classes at the University of Iowa who participated to fulfill a research exposure component of the course. They were recruited in groups of 2–6.

Procedure

On arrival to the lab, participants completed a questionnaire asking them to think of a high school acquaintance whom they were quite familiar with, was currently going to college, and was not a close friend or someone who they intensely liked or disliked. After recording the person's initials, participants were then asked to imagine that in a few days, that individual would compete in a trivia contest against the individual seated to the participant's right. The competition, they were told, would involve answering several questions spanning 20 different trivia categories, with the winner determined separately for each category.

Half of the categories were easy, and the other half were difficult. The 10 easy categories were: Adam Sandler movies, brands of alcohol, celebrities, famous cartoon characters, fast food chains, pop culture, pop music, Rock 'n Roll, TV sitcoms, & US Geography. The 10 difficult categories were: 19th century French painting, 50's movies, dates in history, Eastern philosophy, famous rivers, history of Mesopotamia, indigenous vegetation of the Amazon, Latin American history, baroque music, and South American geography. These categories were taken from Windschitl et al. (2003), who verified that each of the easy categories are indeed perceived by college undergraduates to be easier than each of the difficult categories.

Next, participants were asked to predict the outcome of the competition separately for each trivia category. Specifically, each question took the form:

"For the *X* category, the chance that your high school acquaintance will win is _____% and the chance that your co-participant will win is _____%." Special care was taken to ensure that participants understood the meaning of the scale, and that the two responses for a given category must sum to 100%. As well, the order in which the two complimentary estimates were solicited was counterbalanced, and the order in which the 20 categories were presented was randomized.

Next, participants estimated each competitor's knowledge about each of the 20 trivia categories on a scale from 1 (*very little knowledge*) to 7 (*a great deal of knowledge*). The 2 sets of 20 questions that solicited these estimates (one about the participant's high school acquaintance, the other about the person sitting to the participant's right) were in a counterbalanced order.

As a manipulation check, participants then indicated their confidence in each knowledge estimate. That is, for each of the 2 sets of 20 knowledge estimates they were asked to indicate how confident they were that their knowledge rating was at least somewhat accurate on a scale from 1 (*not confident at all; my rating was a complete guess*) to 7 (*very confident; my rating is likely to be generally accurate*). As with the knowledge estimates themselves, the order in which the 2 sets of 20 questions that solicited these estimates was counterbalanced. Participants also directly compared how much information they felt they had about the two competitors on a scale from 0 (*I have much more information about my co-participant*) to 11 (*I have much more information about my high school acquaintance*), and also rated how well they knew the two on separate 0-to-10 scales.

Finally, participants compared how much they thought about the two contestants when making their predictions on a scale from 0 (*I tended to think about my high school acquaintance*) to 10 (*I tended to think about my co-participant*).

Results

The order in which the questions and options were presented did not influence the results and is not discussed further.

As expected, participants indicated that their high school acquaintance was more likely to win the easy categories than the hard ones, ANOVA $F(1,30) = 17.90$, $p < .001$, $\eta^2 = .57$. In fact, as Table 2 shows, participants tended to expect that their acquaintance would win the easy categories (the likelihood average for easy categories was significantly above 50%; $t(31) = 5.80$, $p < .001$), and lose the hard categories (although the likelihood average for hard categories was not significantly different from 50%; $t(31) = -1.90$, $p = .07$).

Table 2
Mean likelihood judgments by category difficulty and contestant, Study 2

Category difficulty	Contestant			
	High school acquaintance		Co-participant	
	M	*SD*	*M*	*SD*
Difficult	44.98	14.92	55.99	14.94
Easy	61.67	11.38	38.30	11.42

Might these results be due to differences in the knowledge participants had about the two contestants? As expected, participants did indeed feel that they had considerably more information about their high school acquaintance than about the co-participant seated to their right. On a scale ranging from 0 (*I have much more information about my co-participant*) to 11 (*I have much more information about my high school acquaintance*), the mean response was 10.40 ($SD = 1.07$). Participants also gave a significantly higher response to the question "How well do you know your high school acquaintance?" ($M = 7.13$; $SD = 1.45$) than to the question "How well do you know your co-participant?" ($M = 0.19$; $SD = 0.59$), $t(31) = 28.16$, $p < .001$, $\eta^2 = .96$. As well, participants reported that they were more confident about their knowledge ratings for their high school acquaintance than they were about the co-participant. The mean confidence ratings across the 20 high-school acquaintance knowledge estimates was 4.93 ($SD = 0.73$), compared with a mean of 3.53 ($SD = 1.21$) across the 20 co-participant knowledge estimates, $F(1, 31) = 42.59$, $p < .001$, $\eta^2 = .57$.

Did this informational disparity translate into a weighting disparity? To find out, we conducted a separate path analysis for each participant. Specifically, for each participant we conducted a multiple regression predicting their 20 likelihood estimates from their 20 high-school acquaintance knowledge estimates and (simultaneously) their 20 co-participant knowledge estimates. The mean standardized regression coefficients from these analyses, along with the mean simple correlation between the acquaintance and co-participant knowledge estimates, are depicted in Fig. 2. As hypothesized, participants' likelihood estimates were predicted far better by their assessment of their acquaintance's knowledge of the trivia categories than by their assessment of the co-participant's knowledge of the trivia categories. This difference was verified by a paired-sample *t*-test (after taking the inverse of the co-participant beta in order to enable an appropriate comparison), $t(30) = 8.05$, $p < .001$. This difference was also characteristic of the majority of participants: for 27 of the 32 participants, the beta value for estimated acquaintance knowledge was greater in magnitude than the beta value for estimated co-participant knowledge.

Further evidence of participants' tendency to focus more on their acquaintance's knowledge of the trivia category than the co-participant's knowledge of the trivia categories came from the participants' own accounts. When asked to compare how much they thought about the two contestants on a scale from 0 (*I tended to think about my high school acquaintance*) to 10 (*I tended to think about my co-participant*), the mean response across the twenty trivia categories was significantly below the scale's midpoint ($M = 2.28$; $SD = 2.19$), $t(31) = 7.03$, $p < 001$.

Discussion

Taken together, the results of Study 2 provide converging evidence for a rational discounting interpretation of egocentrism in social comparison. Participants predicting the outcome of a competition between someone they knew well (a high-school acquaintance) and someone they did not (a co-participant) tended to focus more on the strengths and weaknesses of the former than the latter. As a consequence, participants tended to believe that their high-school acquaintance would win the rounds involving easy trivia categories but lose the ones involving difficult trivia categories. It is a small step to assume that knowledge differences in this study have similar consequences for self-other comparisons. That is, because we tend to have much more information about ourselves than others, we use our knowledge about ourselves more than our knowledge about others when making comparative judgments or estimating the likelihood of outperforming others.

Although the results of Studies 1 and 2 are clearly consistent with the hypothesis that knowledge differences between self and other can underlie egocentrism in social comparison judgments, neither study *directly* manipulated knowledge, hence both studies are open to alternative interpretations. For instance, although the tendency of participants in Study 1 to overestimate their relative engagement in common activities and underestimate their relative engagement in rare activities was reduced for activ-

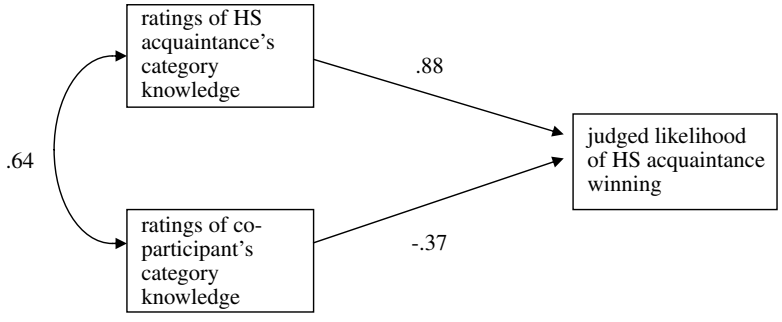

Fig. 2. For each participant, a path analysis was conducted predicting his/her likelihood judgments about the high school acquaintance winning from his/her knowledge ratings for both contestants. This figure shows the average values from these path-analyses. Average standardized betas appear on the straight arrows. Average correlation appears on the curved arrow. Because each participants' likelihood judgments for the two contestants was constrained to equal 100%, a set of path analyses involving likelihood judgments about the co-participant rather than the high school acquaintance would look identical, except the signs on the standardized path coefficients would be reversed.

ities that were public rather than private, there may have been other differences in the activities that could have produced these results. As well, although participants focused more on the features of the person they knew well (i.e., a high school acquaintance) than the features of person they did not (i.e., a co-participant), there may have been other differences between these two individuals besides participants' familiarity with them that could have produced the results. What is really needed is an experimental manipulation of the knowledge people have about the individuals facing each other in a competition to see whether this influences the extent to which people focus on one individual over another—and the corresponding biases that tendency engenders. Our third and final study was designed to provide it.

Study 3: The fog of war

Participants in Study 3 played a mock war game in which each participant acted in the role of a hypothetical army general about to wage war with another participant. The game was rigged such that both armies were either exceptionally strong or exceptionally weak. Based on prior research, we predicted that participants would tend to focus on their own strengths more than the strengths of their competitor when predicting the outcome (Moore & Kim, 2003; Windschitl et al., 2003). As a result, participants should show a shared circumstance effect. Specifically, we expected participants to be more confident about the likelihood of winning the war when both armies were strong than when both armies were weak.

To investigate the rational discounting explanation of this effect, we experimentally varied the amount of information participants had about the enemy. Specifically, prior to predicting the outcome, each general was given intelligence about the enemy forces. The quality of that intelligence, however, varied. Some participants learned a considerable amount of information about the enemy, whereas others learned little.

Our predictions were simple: If the tendency to focus on one's own strengths more than one's competitor's strengths when predicting the outcome of the competition (and the social comparison biases that tendency engenders) is in part due to the differential knowledge people have about those strengths, then participants should pay more attention to the strengths and weaknesses of the enemy when they have reliable data than when they do not. As a consequence, whereas participants might show a shared circumstance effect with poor army intelligence, that effect should be diminished when they have good army intelligence.

Method

Participants

One hundred and fifty University of Illinois students (87 women, 58 men, 5 unidentified) enrolled in an introductory course in psychology earned partial course credit for participating.

Procedure

Participants were recruited in pairs. On arrival to the lab, participants were told that they would be playing the role of a general about to enter war with another participant. Their goal, they were told, was simply to predict the outcome.

To help them make these predictions, each army had been evaluated along 6 major dimensions: Air forces, ground forces, naval forces, supplies, medical facilities, and central command. These major dimensions were further subdivided into a total of 15 facets (e.g., fighters, bombers, missiles), each of which was rated on a 1-to-10 scale (with higher numbers representing greater strength).[3]

Rather than learning all of the ratings corresponding to each army, however, participants were shown only a fraction of them. In the *good intelligence condition*, that fraction was the same for both armies. That is, participants learned about exactly 10 randomly selected facets of their own army, and 10 randomly selected facets of the enemy's army. In the *poor intelligence condition*, in contrast, participants learned about 10 facets of their own army but only one facet of their opponent's army.

Orthogonal to this intelligence manipulation, we also manipulated the strength of both armies. In the strong army condition, all ratings were either 8, 9, or 10, and in the weak army condition, all ratings were either 1, 2, or 3. To ensure that there were no systematic differences in the diagnosable strength of the two armies, the mean rating of the two armies was always the same (either 9 or 2), which in the bad intelligence condition meant that the enemy's sole revealed facet was rated either a 9 or 2. This, along with the fact that the facets were selected randomly, ensured that the design of the study was a true 2 (intelligence: good vs. poor) × 2 (army strength: strong vs. weak) between-subject factorial.

After this information was presented, participants were asked:

"Suppose that the two armies enter battle. We know that you have only limited information to go on, but how likely do you think it is that your army would win?"

[3] The specific facets varied. For instance, whereas one's own army's "supply" category might be subdivided into the facets "food" and "ammunition," the enemy's supply category might be divided into the facets "water" and "gasoline." This was done so that we roughly equate the two armies in terms of strength without providing identical information. The specific facets were either (A) air forces (bombers, stealth fighters), ground forces (size, artillery, helicopters, weapons), central command (strategy, long-range missiles, communications), supplies (food, ammunition), naval forces (aircraft carriers, warships, missiles), and medical facilities (number), or (B) air forces (stealth bombers, fighters), ground forces (tanks, bombs, tactics, number of troops), central command (generals, morale, radar), supplies (water, gasoline), naval forces (destroyers, rockets, submarines), and medical facilities (efficiency).

This question was followed by a 21-point probability scale from 0% (*I would definitely lose*) to 50% (*I am just as likely to win as to lose*) to 100% (*I would definitely win*) presented in increments of 5%.

Next, participants evaluated both the strength of their own army and the strength of the enemy separately on a scale from 0 (*very weak*) to 9 (*very strong*). Finally, all participants estimated how much knowledge they had about their opponent's army on a separate scale from 0 (*very little*) to 9 (*a lot*).

Results

As a manipulation check, we first compared how much information participants said they had about their opponent's army across the two intelligence conditions. As expected, participants indicated that they knew considerably more about their opponent's army in the good army intelligence condition ($M = 3.89$, $SD = 1.99$) than in the poor army intelligence condition ($M = 1.96$, $SD = 1.74$), $F(1, 140) = 37.90$, $p < .001$, $\eta^2 = .21$.

How did this manipulation influence participants' predictions about the outcome of war? When army intelligence was poor, we observed the expected shared circumstance effect. As Table 3 reveals, participants were more confident that their side would win when both sides were strong than when both sides were weak, $F(1, 73) = 7.40$, $p = .008$, $\eta^2 = .09$. When army intelligence was good, on the other hand, we observed no such shared circumstance effect. Participants were no more confident that their side would win when both sides were strong than when both sides were weak. In fact, if anything, the opposite was true, although this difference was not statistically significant, $F(1, 73) = 1.43$, $p = .236$, $\eta^2 = .02$. This reduction of a shared circumstance effect was verified by a 2 (intelligence: good vs. poor) × 2 (army strength: strong vs. weak) fully between-subject ANOVA, which revealed the expected 2-way interaction, $F(1, 146) = 7.94$, $p < .01$, $\eta^2 = .05$.

What accounted for this reduced shared circumstance effect? Our account is that when participants were in the usual position of knowing more about their own strengths and weaknesses than the strengths and weaknesses of their opponent, they based their assessment of who would win more on the former than on the latter. This egocentrism was reduced, however, when participants were in the unusual position of knowing just as much about their opponent as they knew about themselves. To test this hypothesis, we conducted a path analysis to find out how much participants' predictions of the outcome of the competition were predicted by their assessment of the strength of their own army versus their assessment of their opponent's army, respectively. Specifically, we conducted two such analyses: one for participants in the good intelligence condition, and one for participants in the poor intelligence condition.[4]

Table 3
Mean likelihood judgments by army strength and intelligence, Study 3

Army strength	Army intelligence			
	Poor		Good	
	M	*SD*	*M*	*SD*
Strong	66.58	17.86	51.89	17.29
Weak	54.19	21.46	56.84	18.51

The results of those analyses are depicted in Fig. 3. As can be seen, when intelligence was poor, participants' likelihood estimates were predicted far better by their assessments of their own army's strengths and weaknesses than by their assessment of the enemy's strengths and weaknesses, $z = 3.05$, $p = .002$. When intelligence was good, on the other hand, that egocentrism disappeared, $z = 1.04$, $p = .298$.

Discussion

The results of Study 3 provide strong experimental evidence for our rational discounting account of egocentrism in social comparison. Participants competing with one another in a mock war game believed that they were more likely to win when both sides were strong than when both sides were weak, consistent with prior work (Moore & Kim, 2003; Windschitl et al., 2003). However, that tendency was reduced—indeed, disappeared altogether—when participants were provided with just as much information about their opponent as they had about themselves.

General discussion

Prior work has found that when people compare themselves with others they egocentrically focus on their own strengths and contributions more than the strengths and contributions of the comparison group (Burson et al., 2006; Chambers et al., 2003; Klar & Giladi, 1997; Kruger, 1999; Kruger & Burrus, 2004; Moore & Kim, 2003; Windschitl et al., 2003; see Chambers & Windschitl, 2004, for a review). As a consequence, individuals tend to overestimate their comparative standing when absolute standing is high and underestimate comparative standing when absolute standing is low. The present research suggests that these overestimations and underestimations may be (at least in part) attributable to a tendency for respondents to base their comparative evaluation on that which they knew well more than on that which they knew poorly.

In Study 1, college students compared their own engagement in a series of activities with that of the typical student. Consistent with prior work (Kruger & Savitsky, 2006), participants thought that they performed common activities more than the typical person and rare activities less than typical person. However, that effect was reduced for public

[4] We conducted this between-subject path analysis instead of the within-subject procedure used in Studies 1 and 2 because each participant made only one comparative estimate.

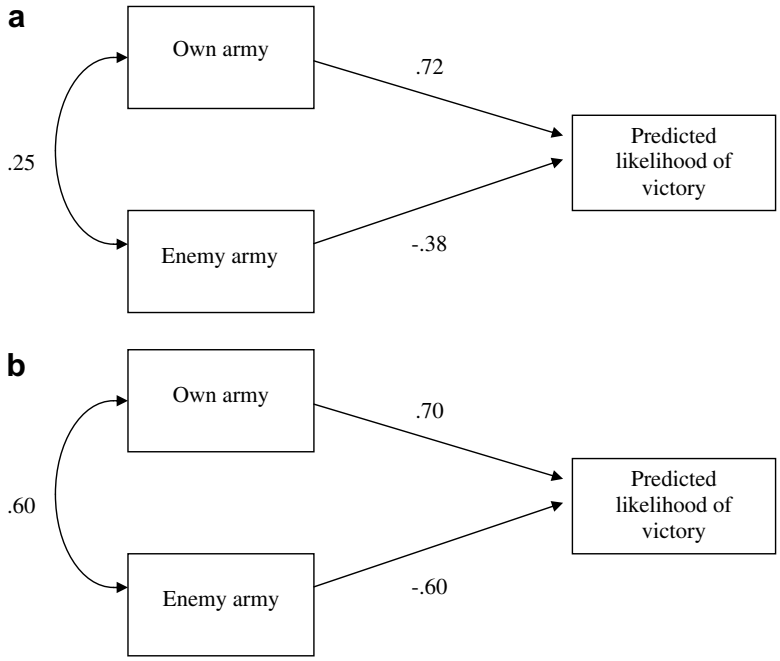

Fig. 3. The relationship between participants' estimates of their likelihood of victory and their estimates of the strength of their own army and the enemy's army, respectively. Standardized path coefficients appear on the straight arrows. Correlations appear on curved arrows. (a) The relationship when army intelligence was poor. (b) The relationship when army intelligence was good.

activities where the actions of others are easily observable (Table 1).

Study 2 extended the results of Study 1 to social comparisons of comparative strength, and with a different manipulation of knowledge. Participants predicted the outcome of trivia competition between two competitors: one of whom they knew well (specifically, a high school acquaintance) and one of whom they did not (a co-participant). As expected, participants' estimates of the likely victor of the contest were predicted better by their assessment of their acquaintance's knowledge than by their assessment of the co-participant's knowledge (Fig. 2). As a result, participants expected their high-school acquaintance to win the contests involving easy trivia categories (e.g., Rock 'n Roll) but to lose the contests involving difficult trivia categories (e.g., History of Mesopotamia, see Table 2).

Finally, Study 3 replicated the basic results of Studies 1 and 2 with an experimental manipulation, one that allowed us to equate the knowledge participants had about themselves and the comparison other. Participants playing the role of an army general about to enter war with another participant predicted the outcome of the battle. As in previous work, participants were more confident about their chances of winning when both sides were strong than when both sides were weak (Moore & Kim, 2003; Windschitl et al., 2003). However, this was only the case when participants had more information about their own army than their enemy's army. When participants had an equal amount of information about both armies, in contrast, confidence was unaffected by army strength (Table 3). As in Studies 1 and 2, path analyses revealed that the tendency of individuals to base their comparative judgments on self assessments more than competitor assessments was reduced as their knowledge about their competitor increased, consistent with our rational discounting account (Fig. 3).

Are there any alternative interpretations of our results? Recently, Moore and Small (in press) have suggested a different route by which knowledge might influence comparative judgments (see also Chambers & Windschitl, 2004). Specifically, Moore & Small argue that because people know more about themselves than they do about others, their estimates of others are likely to be less extreme (i.e., more regressive) than their estimates of themselves. As in the present case, this implies an overestimation of relative standing when absolute standing is high and an underestimation of relative standing when absolute standing is low. It also implies that as the knowledge people have about others increases, the tendency to over- or underestimate comparative standing should decrease—again, exactly the same prediction as in the present case.

Is there any way to differentiate the rational discounting account from the regression account? The key distinction is that whereas the rational discounting account implies that the bias in comparative judgment (and its reduction) can be traced to differences in the weight assigned to self and comparison group estimates, the regression account implies that the bias (and its reduction) is due to differences in the self and comparison group estimates themselves.

This distinction in theory translates into a distinction in predictions. Specifically, the two accounts make different predictions regarding the difference (or lack thereof)

between bias in comparative judgment when it is calculated directly (i.e., when participants compare themselves with others on a single comparative scale) versus indirectly (i.e., when participants provide separate estimates of both themselves and the comparison group, with the comparison made by the researcher). The regression account predicts that biases in direct comparisons (and their reduction) should be mirrored by biases in indirect comparisons. The rational discounting account, in contrast, makes the somewhat counterintuitive prediction that biases in direct comparisons need not necessarily be accompanied by biases in indirect comparisons. The account assumes that even when the estimates of the self and the comparison group are not differentially influenced by regression (which would yield no bias on an indirect comparison generated by the researcher), participants would give greater weight to their estimates of the self than to their estimates of the comparison group when they make a direct-comparison judgment (see Kruger & Burrus, 2004, for a further discussion of this issue).

How are these divergent predictions borne out in the data presented in this manuscript? In Studies 1 and 2, the results failed to support the regression account. That is, follow-up analyses revealed that the tendency of individuals to over- or underestimate how they compared to others was unique to direct comparisons.[5] Indeed, this seemingly anomalous pattern is a feature of a large body of research comparing direct and indirect methods of comparison (for reviews see Chambers & Windschitl, 2004; Helweg-Larsen & Shepperd, 2001). However, it would be misleading (and, we think, incorrect) to suggest that the regression account does not provide at least a partial explanation for bias in comparative judgment. Indeed, when we compared participants' estimates of the strength of their own army with their estimates of the strength of their opponent's army, we found precisely what one would expect from the regression account. When both armies were strong, participants tended to provide higher estimates of their own army strength than their opponent's army strength—and this tendency was reduced when army intelligence was good. Similarly, when both armies were weak, participants tended to provide lower estimates of their own army strength than their opponent's army strength—and again, this tendency was reduced when army intelligence was good. Although neither of these findings conflict with the rational discounting account, neither are they explained by it. Instead, we suspect that they hint at the operation (and validity) of precisely the regression account proposed by Moore and Small (in press).

It would also be misleading to suggest that differences in knowledge provide a complete explanation for egocentrism in comparative judgment. Consider a follow-up to Study 2 in which we manipulated the target of the solicited likelihood judgment. Specifically, whereas some participants estimated their high school acquaintance's chances of beating the co-participant, others estimated the co-participant's chances of beating their high school acquaintance. Although the two question are logically equivalent (but inverse), we found that both the tendency of individuals to focus on the person they knew well (the high school acquaintance) and the resulting tendency for individuals to expect their acquaintance to win the easy trivia categories and lose the difficult categories was reduced when the specified target of the likelihood judgment was the co-participant rather than the acquaintance. This pattern presumably cannot be explained by any rational discounting procedure based on differences in knowledge. Instead, it reflects the additive effect of focalism. For participants asked about their co-participant's likelihood of winning, focalism increased attention to their assessments of the co-participant. This follow-up to Study 2 illustrates that systematic cases of over- and underconfidence in the face of shared benefits and adversities are multiply determined. Whereas the present studies have isolated rational discounting and demonstrated that it can be a sufficient cause of over- and underconfidence and comparative bias, there are numerous forms of motivated and nonmotivated mechanisms—with focalism as one example—that can contribute to the production of such biases in various contexts (for review, see Chambers & Windschitl, 2004).

This work provides an additional perspective regarding previous work showing that above-average effects and comparative optimism effects are sometimes reduced in size when people are asked to compare to specific individuals rather than "average" others (e.g., Alicke, Klotz, Bre-

[5] In Study 1, we calculated bias indirectly by subtracting each participant's estimate of how much the typical person engages in the activity from their estimate of how much they engage in the activity. Averaging across the 10 activities within each category, we found that although participants did tend to think that they engaged in the rare activities less than the typical person, they also thought this about the common activities—at least when the activities were observable (there was no tendency one way or the other for the private common activities). The corresponding means (and *SD*s) for the private/common, private/rare, public/common, public/rare were 0.04 (0.56), −0.47 (0.83), −0.32 (−0.32), and −.74 (0.98), respectively, with all but the first figure significantly different from zero at the .05 alpha level. As expected, a 2 (rare vs. common) × 2 (private vs. public) ANOVA revealed no hint of an interaction when the bias was calculated indirectly, $F(1,33) < 1$, *ns*.

In Study 2, we calculated bias indirectly by subtracting participants' estimates of how much knowledge the co-participant had about each trivia category from their estimates of how much knowledge their high school acquaintance had about each trivia category. We then averaged these values across the 10 easy categories ($M = 0.39$, $SD = 0.84$) and separately across the 10 difficult categories ($M = -0.02$, $SD = 1.15$). The hard/easy effect for these indirect measures was not significant, $t(31) = 1.40$, $p > .10$.

In Study 3, we calculated bias indirectly by subtracting participants' estimates of the strength of enemy's army from their estimates of the strength of their own army. Unlike in Studies 1 and 2, these indirect comparisons yielded data that were similar to the direct comparisons. Participants were more optimistic in the strong army condition ($M = 1.88$, $SD = 1.60$) than in the weak army condition ($M = -0.17$, $SD = 2.15$) when army intelligence was poor, $F(1,66) = 19.76$, $p < .001$, $\eta^2 = .23$, whereas there was no such shared circumstance effect when army intelligence was good, Ms $= 0.00$ ($SD = 1.57$) vs. 0.24 ($SD = 1.59$), $F < 1$, *ns*. This pattern was verified by a 2 (intelligence: good vs. poor) × 2 (army strength: strong vs. weak) ANOVA interaction, $F(1,137) = 15.26$, $p < .001$, $\eta^2 = .10$.

itenbecher, Yurak, & Vredenburg, 1995; Perloff & Fetzer, 1986). Most relevant is the work of Alicke et al. (1995), in which the individuation of a comparison referent (comparing with a specific individual rather than an "average" individual) and personal contact with the comparison referent (i.e., putting the rater in physical proximity to the referent) were experimentally manipulated. Our rational-discounting explanation cannot account for why an above-average effect would shrink under conditions of manipulated personal contact (assuming the contact did not provide useful information), but it does provide an additional explanation—beyond those offered by Alicke et al. (1995) and Perloff and Fetzer (1986)—for why individuation can reduce the magnitude of above-average effects. Alicke et al. suggested that when a comparison referent is vague (e.g., "average student") rather than individuated, a respondent has more latitude to apply a better-than-average heuristic. Perloff & Fetzer argued that when the comparison referent is vague, this allows people more latitude to actively make a downward comparison during the judgment process. Whereas these explanations assume that vagueness in the comparison referent facilitates more self-favoring responses, our explanation suggests that the vagueness of the comparison referent may trigger a rational tendency to discount one's assessment of the referent and rely more heavily on one's self-assessment—which can yield not only cases of above-average effects, but below-average effects as well.

In closing, we cannot help but reflect on the relation between our rational explanation of egocentrism in social comparisons and a point made by Dawes (1989) and Hoch (1987) about the "false consensus effect," the tendency for proponents of a particular belief or action to provide higher consensus estimates for that belief or action than opponents. Although demonstratively false (both groups cannot both be right), the belief is precisely what one would expect if people quite sensibly use what they know (their own belief or action) to inform what they do not (the belief and actions of others). "Overweighting," as Dawes (1989) put it, "occurs only if subjects weight their own response more than that of another—randomly chosen—person in the group whose response is known to them" (p. 1). When the response of others is *unknown*, focusing on the self may be a perfectly rational statistical procedure. In much the same way, we have argued, focusing on the self when making a comparison between the self and others may be defensible in light of the fact that people generally know considerably more about the former than they do about the latter. That said, there is another similarity between the present work and the work of Dawes and Hoch that bears mention. Although both lines of work suggested that rational information processing strategies might contribute to the biases, other research revealed that they were not wholly explained by them (Krueger & Clement (1994) in the case of the false consensus effect, Kruger & Burrus (2004), Windschitl et al. (2003) and others in the case of egocentrism in social comparison). It may be wholly rational to be egocentric, but egocentrism cannot be explained wholly by rationality.

Appendix A. Activities used in Study 1

A.1. Private (unobservable)/common

Notice other people's clothes, Look out the window, Look in the mirror, Think about a loved-one, Feel rushed, Check weather forecast (in paper, TV, internet, etc.), Get a craving (for food, drink, etc.), Look at watch/clock, Feel tired, Think about school/schoolwork

A.2. Private (unobservable)/rare

Take bubble bath, Think about tax law, Mend clothes, Check baseball scores on internet, Balance check book, Change brand of deodorant, Meditate, Floss teeth, Think about death, Make vacation plans

A.3. Public (observable)/common

Watch TV, Wait in line (in store, for movie, exiting class, etc.), Hang out with friends, Walk to and from class, Listen to music, Take subway/bus, Use phone, Carry a bag/backpack, Wear jeans, Use computer

A.4. Public (observable)/rare

Wear denim hat, Burn something in a microwave, Buy a new pair of glasses, Start dating someone new, Throw dinner parties, Change jobs, Move to new residence, Talk about grandparents, Get haircut, Go on vacation

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