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Up and Down: Counterfactual Closeness is Robust to Direction of Comparison

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Author Note

The preregistrations, stimuli, data, and code for all experiments are available on the Open Science Framework, https://osf.io/mxs4u/. All preregistrations covered the number of participants, design, and main analysis plan.

Abstract

People often think about how things could have been better or worse. People make these upward and downward comparisons in different situations and with differing emotional consequences. We investigated whether the direction of counterfactual comparisons affects people's judgements of counterfactual closeness. In four preregistered experiments (N=2,142), participants saw vignettes where agents lost or won a luck-based game. In Experiments 1, 2, and 4, participants judged counterfactual closeness in two ways: if a counterfactual outcome almost happened, and if it easily could have happened. These judgments were affected by different factors, but did not substantially differ based on the direction of comparison. In Experiments 3 and 4, participants predicted agents' emotions—whether losers would be sad, winners would be happy, and whether both would be surprised by the outcome. Emotion predictions showed similar patterns regardless of whether agents lost or won. Participants predicted stronger emotional reactions when the prior probability of the counterfactual outcome was high rather than low, though this effect was somewhat stronger when agents lost. Together, these findings join recent work in suggesting that Almost and Easily judgments tap into distinct forms of counterfactual closeness, and also suggest this distinction is robust to the direction of counterfactual reasoning.

Keywords: counterfactuals, probability, emotion, judgment, cognition

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How might things have gone better? And how could they have been worse? These two directions for counterfactual thinking, upward versus downward, differ. They are triggered in different situations, elicit different feelings, and likely serve different psychological functions (see De Brigard, 2023, Epstude & Roese, 2008, and McMullen et al. 1995 for reviews; also see Byrne, 2016). In this paper, we investigate whether the distinction between upward and downward comparisons matters in people's thinking about *close* counterfactuals—outcomes that did not happen, but which people feel almost happened or easily could have.

One motivation behind this investigation is to better understand the distinction between two kinds of counterfactual closeness—one more strongly connected with the distance between reality and the counterfactual alternative, and the other more strongly connected to its prior probability (Doan et al., 2023a, 2023b). So far, this distinction has been investigated by asking people about situations where things could have gone better—upward comparisons. Here we ask whether the distinction holds when people think about how things could have been worse (downward comparisons).

Upward vs downward counterfactuals

People make upward and downward counterfactual comparisons in different situations. They are more likely to make upward comparisons when outcomes seem bad, and downward comparisons when they seem good (e.g., Mandel, 2003; Medvec & Savitsky, 1997; Nasco & Marsh, 1999; Roese & Olson, 1995). For example, in one experiment, participants played a computerized game of blackjack and ended with $5 by tying the dealer (Markman et al., 1993). Participants were more likely to make upward comparisons when this outcome was framed as a loss (i.e., participants started with $20 and lost $15 by tying). By contrast, they were more likely

to make downward comparisons when it was framed as a gain (i.e., they started with $0 and gained $5 by tying). Similar patterns have emerged in experiments where participants played true games of chance with no room for skill (e.g., Wohl & Enzle, 2003; Wu et al., 2015).

Upward and downward counterfactuals can also elicit different emotions. In general, people feel worse after having upward counterfactual thoughts than downward ones (e.g., Markman et al., 1995; Medvec & Savitsky, 1997; Roese, 1994; Wu et al., 2017). For example, in the blackjack experiment described above, participants were less satisfied with the outcome when it was framed as a loss (eliciting upward comparisons; Markman et al., 1993).[1] Beyond this difference in valence, there are further differences between how upward and downward counterfactuals elicit emotions. For example, emotions (both actual and predicted) may be more strongly affected by upward counterfactual comparisons than by downward ones (e.g., Doan et al., 2020; Medvec & Savitsky, 1997; also see van Dijk & van der Pligt, 1997). Also, children feel and anticipate the upward counterfactual emotion of regret before the downward counterfactual emotion of relief (e.g., Gautam et al., 2022; Guerini et al., 2020; Guttentag & Ferrell, 2004; Habib et al., 2012; Weisberg & Beck, 2010, 2012; also see Jones et al., 2023).

Close Counterfactuals

Counterfactuals vary in their closeness to reality. For example, winning a game might seem close to reality for a player who narrowly lost, but not for a player who had no chance of winning. This difference is reflected in language. For example, Kahneman and Varey (1990) noted that close counterfactuals can be expressed by saying an outcome “almost” happened, whereas more distant counterfactuals are expressed using conditionals (e.g., the weaker player

[1]People sometimes show the opposite reactions to upward and downward counterfactuals (Markman & Tetlock, 2000; McMullen, 1997; Zhang & Covey, 2014). For example, if an accident is narrowly avoided, vividly imagining what could have happened (i.e., a downward comparison) can be upsetting rather than uplifting.

would have won the game if the better player had been blindfolded). Kahneman and Varey also noted that one determinant of counterfactual closeness is propensity–the impression that events are causally building to an outcome, even if the outcome does not happen.

However, there is more to counterfactual closeness than saying that high propensity outcomes "almost" happened. Counterfactual closeness can also be expressed by saying that an outcome "easily could have" happened (Teigen, 1995, 1996), and these two ways of expressing counterfactual closeness appear to reflect different kinds of closeness (Doan et al., 2023b). Besides depending on propensity, "Almost" judgments depend on its perceived distance from the actual outcome (e.g., Beck & Guthrie, 2011; Ong et al., 2015; Kühberger et al., 2011) and on whether the outcome was possible (Doan et al., 2023a). Meanwhile, "Easily" judgments depend more strongly on the prior probability of the counterfactual outcome. For instance, consider a game where players win a prize if a lottery machine dispenses six red balls. People are more likely to say that a player almost won if she lost with five red balls rather than three. However, their judgments of whether the player easily could have won are more influenced by her prior odds as determined by the proportion of red balls in the machine (Doan et al., 2023b).

The Current Investigation

The distinction between these two kinds of counterfactual closeness (Almost, Easily) has so far been investigated by asking people about outcomes that could have turned out better—upward counterfactual comparisons (Doan et al., 2023a, 2023b). We examine if these judgments work the same when people consider comparisons with outcomes that could have turned out worse. Beyond looking at judgments of counterfactual closeness itself, we also examine how people predict emotional responses. Previous work suggested that Almost judgments are linked

with sadness whereas Easily judgments are more connected with surprise. But this pattern could depend on whether people make upward or downward counterfactual comparisons.

We conducted four experiments. In each experiment, participants read about a game where a player chooses one of 12 closed boxes. The player wins if the chosen box contains a special star balloon but loses if it contains a regular balloon (also see Doan et al., 2021). Participants then learned about different players who lost or won the game. Experiment 1 first examined judgments of counterfactual closeness for players who lost the game (upward comparisons); Experiment 2 then examined these judgments for players who won (downward comparisons). Experiment 3 returned to upward comparisons but examined emotion predictions. Finally, Experiment 4 looked at both upward and downward comparisons and asked participants to assess both counterfactual closeness and to predict emotions.

General Methods

The preregistrations, stimuli, data, and code for all experiments are available on the Open Science Framework, https://osf.io/mxs4u/. All preregistrations covered the number of participants, design, and main analysis plan.

Participants in all experiments were recruited using Cloud Research (Litman et al., 2017), a platform for recruiting participants from Amazon's Mechanical Turk that facilitates screening out low-quality participants. We recruited participants from the United States who had completed at least 100 HITS and had an approval rating of at least 95%. We tested different participants in each experiment. In Experiments 1 to 3, we aimed for 200 usable participants per between-subjects condition; in Experiment 4 we aimed for 100 per between-subjects condition.

In all experiments, participants first read about a game of chance and were asked a comprehension question about it; see the stimulus files at OSF for all comprehension questions.

If participants answered incorrectly, they were informed of this, and were again shown the contest rules and re-asked the comprehension question. If they answered incorrectly again, this repeated one more time. After correctly answering the comprehension question (or answering incorrectly three times), participants moved to the main task. It was followed by two further comprehension questions. Finally, participants were asked for their age and gender.

We excluded data from participants if they did not pass the comprehension question before the main task within 3 attempts, if they failed at least one of the comprehension questions asked after the main task, or if they neglected to answer any test questions. Analyses in all experiments used generalized estimating equations models (GEE; linear; independent correlation matrix) and interactions were followed up with Bonferroni-corrected pairwise comparisons.

Experiment 1

We first examined Almost and Easily judgments. We were interested in seeing if the distance from an alternative outcome and the prior probability of winning (i.e., the alternative outcome) affected these judgments differently.

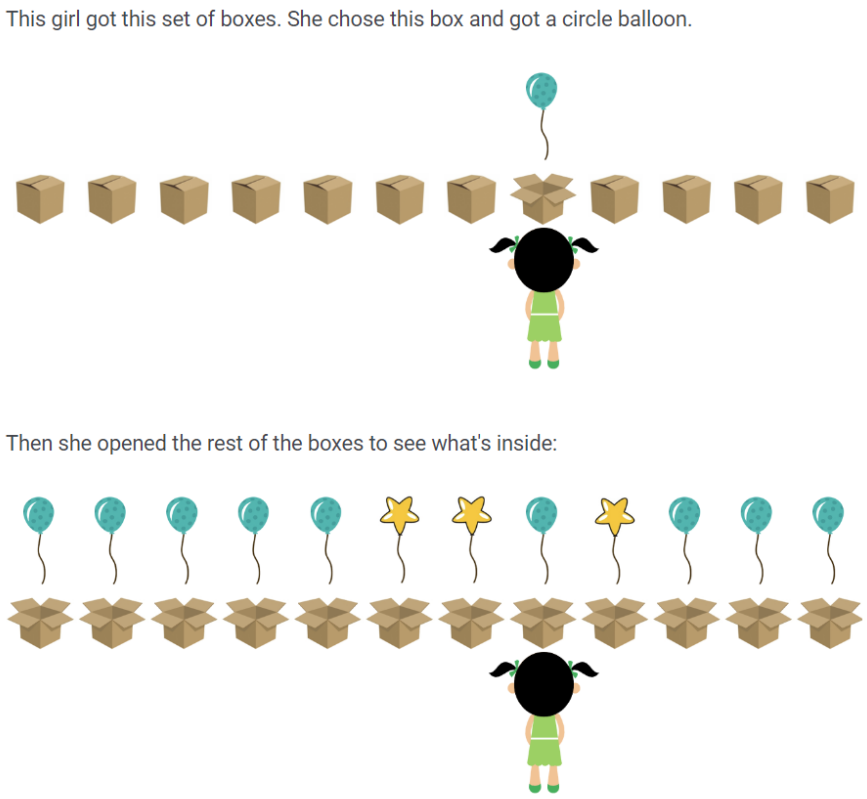
Methods

Participants. We tested 391 participants (mean age = 39 years, range = 20-78, SD = 11.49; 147 women, 239 men, 5 indicating “other” or preferring not to respond). An additional 37 participants were excluded for failing comprehension questions.

Procedure. Participants first read about the game and its rules (i.e., players win if they choose a box with a star balloon and lose if it contains a circle balloon). Participants then read four scenarios where different players lost the game—each chose a box with a circle balloon, and then got to see the contents of the other boxes.

The experiment used a 2X2X2 design where each of the four scenarios corresponded with a cell yielded by crossing two factors (within-subjects). One factor was distance—whether the chosen box was close to, or far, from winning boxes. When the distance was close, the chosen box was flanked by boxes with star balloons; when the distance was far, it was flanked by boxes with circle balloons (i.e., boxes with star balloons were further away). The other factor was the prior probability of getting a winning balloon. Players either chose from a row of boxes where 9 of 12 (75%) held winning balloons, or from a row where only 3 of 12 (25%) held winning balloons; see Figure 1 for a sample scenario. After reading about each player, participants were either asked for Almost or Easily ratings about winning (between-subjects). That is, they were either asked questions like “Did the girl almost win the contest?” or like “Could the girl easily have won the contest?”. Participants responded using a 7-point scale ranging from “Definitely No” (1) to “Definitely Yes” (7).

Figure 1. *Sample scenario from Experiment1*



Note. In this scenario, the chosen box was close to boxes that would have brought the counterfactual outcome, and the prior probability of that outcome was low.

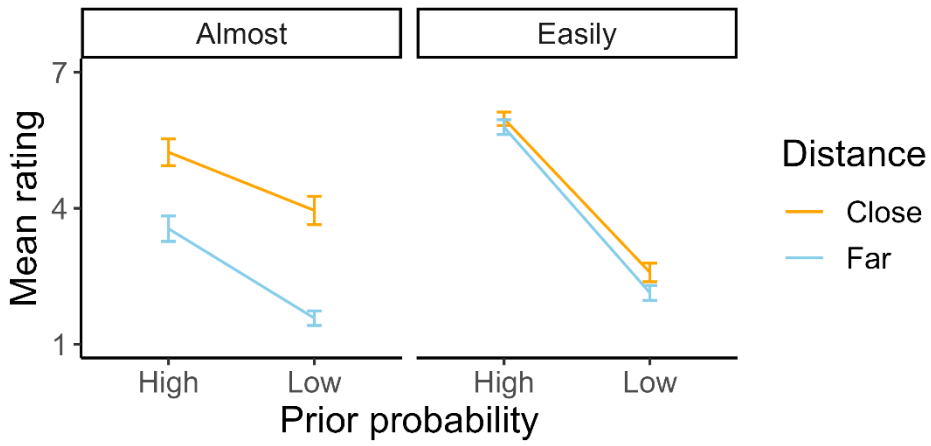
Results and Discussion

Figure 2 shows participants' mean ratings. A 2x2x2 GEE model with distance (close, far) and prior probability of the counterfactual outcome (high, low) as within-subjects factors, and expression (Almost, Easily) as a between-subjects factor revealed that all three main effects were significant. Ratings were higher for Easily than Almost judgments, $Wald\ X^2(1) = 25.71$, $p < .001$, when winning boxes were close rather than far from the chosen one, $Wald\ X^2(1) = 231.31$, $p < .001$, and when the prior probability of winning (i.e., the counterfactual outcome) was high rather than low, $Wald\ X^2(1) = 959.75$, $p < .001$.

All interactions were also significant. The 2-way interaction between expression and distance, *Wald* $X^2(1) = 123.15$, $p < .001$, resulted because the effect of distance (close>far) was larger for Almost ratings ($M_{difference} = 2.03$, $p < .001$) than for Easily ratings ($M_{difference} = 0.32$, $p < .001$). In contrast, the 2-way interaction between expression and prior probability, *Wald* $X^2(1) = 129.80$, $p < .001$, resulted because the effect of the prior probability of the counterfactual outcome (high>low) was larger for Easily ratings ($M_{difference} = 3.52$, $p < .001$) than for Almost ones ($M_{difference} = 1.63$, $p < .001$).

The 2-way interaction between distance and prior probability, *Wald* $X^2(1) = 26.17$, $p < .001$, resulted because the effect of distance (close>far) was also larger when the prior probability of winning was low ($M_{difference} = 1.41$, $p < .001$) rather than high ($M_{difference} = 0.94$, $p < .001$). However, as Figure 2 shows, this effect was strongly affected by the 3-way interaction including expression, *Wald* $X^2(1) = 5.20$, $p = .023$. With Almost judgments, the effect of distance was significant when prior probability was both low ($M_{difference} = 2.38$, $p < .001$) and high ($M_{difference} = 1.69$, $p < .001$), whereas with Easily ratings, this effect was significant only when prior probability was low ($M_{difference} = 0.45$, $p < .001$), but not when it was high ($M_{difference} = 0.19$, $p = .093$).

Figure 2. Mean ratings and 95% confidence intervals in Experiment 1



Together, these findings show that for upward counterfactual comparisons, people generally give higher Almost ratings when the chosen box was close to winning boxes (rather than far from them), but give higher Easily ratings when the prior probability of the counterfactual outcome (i.e., getting a winning box) was high compared to low. We next examined whether the same patterns arise for downward comparisons, where people think about how things could have been worse.

Experiment 2

Methods

Participants. We tested 396 participants (mean age = 40 years, range = 19-90, SD = 12.50; 179 women, 212 men, 5 indicating "other" or preferring not to respond). An additional 39 participants were excluded for failing comprehension questions.

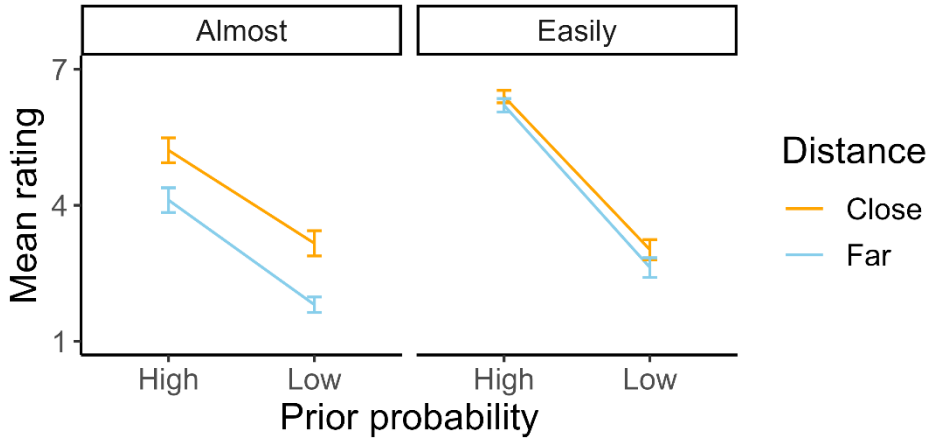
Procedure. Participants saw four scenarios where players won the game—each player chose a box with a star balloon rather than a circle balloon. Chosen boxes were either close or far from losing ones, and contestants initially had either a high (75%) or low (25%) chance of losing. After reading about each player, participants made Almost or Easily judgments about losing (manipulated between-subjects). Hence, they were either asked questions like "Did the girl almost lose the contest?" or like "Could the girl easily have lost the contest?" As before, participants responded on a 7-point scale ranging from "Definitely No" (1) to "Definitely Yes" (7).

Results and Discussion

Figure 3 shows participants' mean ratings. A 2x2x2 GEE model with distance (close, far) and prior probability of the counterfactual outcome (high, low) as within-subjects factors and expression (Almost, Easily) as a between-subjects factor revealed that all three main effects were

again significant. Ratings were higher for Easily than Almost judgments, *Wald* $X^2(1) = 94.76$, $p < .001$, when losing boxes were close rather than far from the chosen one, *Wald* $X^2(1) = 121.63$, $p < .001$, and when the prior probability of losing was high rather than low, *Wald* $X^2(1) = 997.59$, $p < .001$. All three 2-way interactions were also significant: expression by distance, *Wald* $X^2(1) = 46.12$, $p < .001$; expression by prior probability, *Wald* $X^2(1) = 52.53$, $p < .001$; and distance by prior probability, *Wald* $X^2(1) = 5.26$, $p = .022$. The 3-way interaction was non-significant, *Wald* $X^2(1) = 0.07$, $p = .785$.

Figure 3. Mean ratings and 95% confidence intervals in Experiment 2



The interaction between expression and distance occurred because the effect of distance (close>far) was larger for Almost ratings ($M_{difference} = 1.23$, $p < .001$) than for Easily ratings ($M_{difference} = 0.29$, $p < .001$). The interaction between expression and prior probability occurred because the effect of the prior probability of the counterfactual outcome (high>low) was larger for Easily ratings ($M_{difference} = 3.48$, $p < .001$) than for Almost ones ($M_{difference} = 2.18$, $p < .001$). Finally, the interaction between distance and prior probability occurred because the effect of distance (close>far) was larger when the prior probability of losing was low ($M_{difference} = 0.87$, $p < .001$) rather than high ($M_{difference} = 0.65$, $p < .001$), though both differences were relatively small.

These findings largely mirror those from our first experiment. Together, the experiments suggest that with both upward and downward comparisons, distance more strongly affects Almost judgments, whereas prior probability of the counterfactual outcome more strongly affects Easily judgments. In the next experiment, we returned to upward comparisons, but examined how distance and prior probability affect attributions of emotions.

Experiment 3

Methods

Participants. We tested 411 participants (mean age = 41 years, range = 20-80, SD = 12.05; 197 women, 208 men, 6 indicating "other" or preferring not to respond). An additional 21 participants were excluded for failing comprehension questions.

Procedure. Participants saw the scenarios from Experiment 1 (i.e., where each player chose a losing box). After reading each scenario, participants either rated players' disappointment or their surprise (manipulated between-subjects). For instance, they were asked questions like "How disappointed is the girl that she didn't win?" or like "How surprised is the girl that she didn't win?". They responded using a 7-point scale ranging from "Not at all" (1) to "Extremely" (7).

Results and Discussion

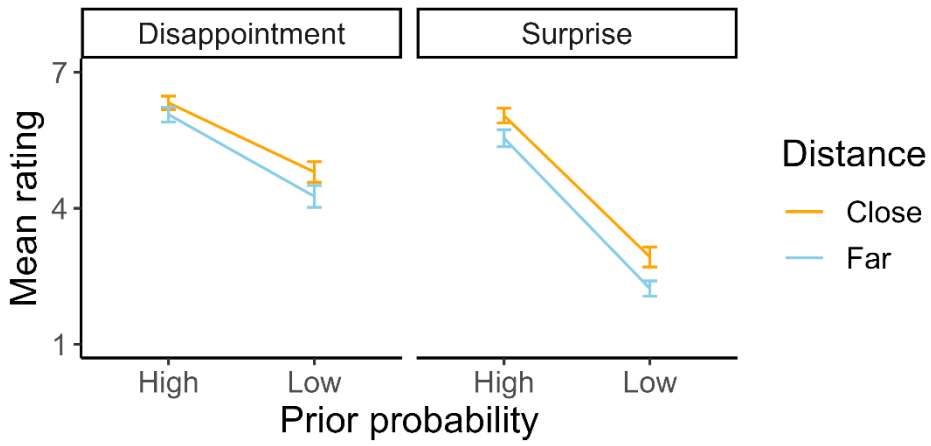
Figure 4 shows participants' mean ratings. A 2x2x2 GEE model with distance (close, far) and prior probability of the counterfactual outcome (high, low) as within-subjects factors, and emotion (disappointment, surprise) as a between-subjects factor revealed that all three main effects were significant. Ratings were higher for disappointment than surprise, *Wald* $X^2(1) = 161.92$, $p < .001$, when winning boxes were close rather than far from the chosen one, *Wald* $X^2(1) = 107.08$, $p < .001$, and when the prior probability of winning was high rather than low,

Wald $X^2(1) = 885.99$, $p < .001$. These main effects were qualified by significant 2-way interactions between emotion and distance, *Wald* $X^2(1) = 4.30$, $p = .038$, emotion and prior probability, *Wald* $X^2(1) = 89.54$, $p < .001$, and distance and prior probability, *Wald* $X^2(1) = 8.00$, $p = .005$. The 3-way interaction was not significant, *Wald* $X^2(1) = 0.23$, $p = .632$.

Both 2-way interactions involving emotion resulted because effects were stronger for surprise than for disappointment. With distance, ratings were higher for both emotions when winning boxes were close rather than far: surprise ($M_{difference} = 0.60$, $p < .001$); disappointment ($M_{difference} = 0.40$, $p < .001$). With prior probability, ratings were higher for both emotions when the prior probability of winning was high rather than low: surprise ($M_{difference} = 3.22$, $p < .001$); disappointment ($M_{difference} = 1.67$, $p < .001$). Finally, the interaction between distance and prior probability occurred because the effect of distance (close>far) was larger when the prior probability of winning was low ($M_{difference} = 0.62$, $p < .001$), rather than high ($M_{difference} = 0.38$, $p < .001$).

To summarize, people generally gave higher disappointment and surprise ratings when the chosen box was close to winning boxes (rather than far from them), and when the prior probability of getting a winning box (i.e., the counterfactual outcome) was high compared to low, but these effects were stronger for surprise than disappointment. This said, whereas the effects of prior probability were large, the effects of distance were very small.

Figure 4. Mean ratings and 95% confidence intervals in Experiment 3



Experiment 4

The results so far show that distance and prior probability differentially affect people's judgments about close counterfactuals and their predictions of emotions. The results of the first two experiments also suggest that distance and prior probability affects close counterfactual judgments similarly regardless of whether people engage in upwards or downwards comparisons. However, this conclusion relies on comparisons across experiments. Further, we do not know whether these factors would affect people's emotion judgments in a similar way when people win and make downward comparisons. So in this final experiment, we examined how distance and prior probability affect people's close counterfactual and emotion judgments in cases where people lose (and make upward comparisons) and win (and make downward comparisons).

Methods

Participants. We tested 944 participants (mean age = 42 years, range = 18-77, SD = 12.11[2]; 460 women, 476 men, 8 indicating "other" or preferring not to respond). An additional 58 participants were excluded for failing comprehension questions.

[2] These age values omit one participant whose age was entered as 2.

Procedure. Each participant saw just one scenario (i.e., rather than four) in a 2X2X2 fully between-subjects design. In the scenario, the player either chose a losing or winning box, the chosen box was either close or far from boxes that would have brought a different outcome, and the prior odds of that other outcome were either high or low (i.e., 75% or 25%).

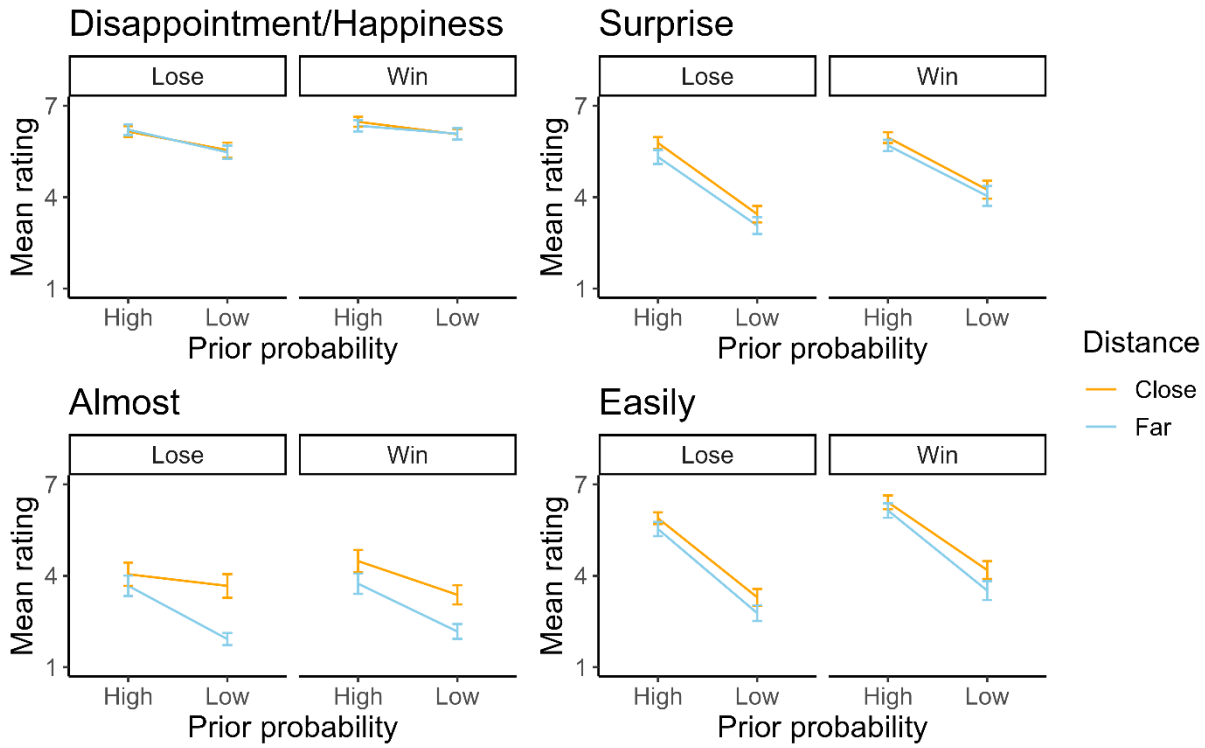
After reading the scenario, participants were first asked two questions about the player's emotions. One question was about the player's disappointment if she lost or about her happiness if she won ("How [disappointed/happy] is the girl that she [lost/won]?"). The other emotion question was about the player's surprise ("How surprised is the girl that she [lost/won]?"). Participants responded to these questions using 7-point scales ranging from "Not at all" (1) to "Extremely" (7). These two questions appeared on the same screen as one another with question order randomized across participants.

After this, participants answered two close counterfactual questions, one about whether the counterfactual outcome almost happened ("Did the girl almost [win/lose] the contest?") and the other about whether the counterfactual outcome easily could have happened ("Could the girl easily have won/lost the contest?") Participants responded to these two questions using 7-point scales ranging from "Definitely No" (1) to "Definitely Yes" (7). These two questions likewise appeared on the same screen as one another, and question order was again randomized across participants.

Results and Discussion

As preregistered, we separately analyzed responses for each of the four questions. In each case, we ran a 2x2x2 GEE model with outcome (lost, won), distance (close, far), and prior probability of the counterfactual outcome (high, low) as between-subjects factors. Figure 5 shows mean responses to each question.

Figure 5. Mean ratings and 95% confidence intervals in Experiment 4



Disappointment/Happiness. Ratings were higher when the player won rather than lost, *Wald* $X^2(1) = 31.75$, $p < .001$, and when the prior probability of the alternative outcome was high rather than low, *Wald* $X^2(1) = 52.00$, $p < .001$. These main effects were qualified by a 2-way interaction between outcome and prior probability, *Wald* $X^2(1) = 5.82$, $p = .016$, which resulted because the effect of prior probability of the alternative outcome (high>low) was larger when the actual outcome was negative ($M_{difference} = 0.67$, $p < .001$) compared with when it was positive ($M_{difference} = 0.34$, $p = .001$). No other main effects or interactions were significant, $ps > .312$.

Surprise. Participants thought the player would be more surprised when she won compared with when she lost, *Wald* $X^2(1) = 42.11$, $p < .001$, when the chosen box was close rather than far from boxes that would have brought the counterfactual outcome, *Wald* $X^2(1) = 13.10$, $p < .001$, and when the prior probability of that outcome was high rather than low, *Wald*

$X^2(1) = 490.61$, $p < .001$. These main effects were qualified by a significant 2-way interaction between outcome and prior probability, *Wald* $X^2(1) = 11.52$, $p = .001$, which resulted because the effect of prior probability (high>low) was larger when the outcome was negative ($M_{difference} = 2.29$, $p < .001$) rather than positive ($M_{difference} = 1.68$, $p < .001$). No other interactions were significant, ps > .302.

Almost. Participants gave higher ratings when the chosen box was close rather than far from boxes that would have brought the counterfactual outcome, *Wald* $X^2(1) = 75.06$, $p < .001$, and when the prior probability of that outcome was high rather than low, *Wald* $X^2(1) = 104.39$, $p < .001$. These main effects were qualified by a significant 2-way interaction between distance and prior probability, *Wald* $X^2(1) = 15.15$, $p < .001$, which resulted because the effect of distance (close>far) was larger when the prior probability of the counterfactual outcome was low ($M_{difference} = 1.48$, $p < .001$) rather than high ($M_{difference} = 0.56$, $p = .011$). No other main effects or interactions were significant, ps > .054.

Easily. Participants gave higher ratings when considering how a winning player could have lost (downward comparisons) than when considering how a losing player could have won (upward comparisons), *Wald* $X^2(1) = 56.41$, $p < .001$. Ratings were also higher when the chosen box was close rather than far from boxes that would have brought the counterfactual outcome, *Wald* $X^2(1) = 24.38$, $p < .001$, and when the prior probability of getting that outcome was high rather than low, *Wald* $X^2(1) = 767.89$, $p < .001$. No interactions were significant, ps > .125.

Overall, participants responded similarly regardless of whether the outcomes were bad or good—that is regardless of whether considering the counterfactual outcome meant looking upward or downward. With judgments of counterfactual closeness, there were no significant interactions involving outcome. With emotion judgments, outcome did interact with prior

probability. With both happiness and surprise, the interaction resulted because the effect of the prior probability of the counterfactual outcome (high>low) was larger when the actual outcome was negative compared with when it was positive. Because this apparent difference between judgments of counterfactual closeness and emotions rests on comparing results across analyses, we explored its robustness in an exploratory 4-way analysis with all factors: judgment (Disappointment/Happiness, Surprise, Almost, Easily), outcome (lost, won), distance (close, far), and prior probability (high, low). Consistent with the conclusion that the outcome-by-probability interaction varied across measures, there was a significant 3-way interaction between judgment, outcome, and prior probability, $Wald\ X^2(3) = 3.00$, $p = .029$; we show the full results of the 3-way analysis in a table at the paper's OSF page (https://osf.io/mxs4u/). Finally, it's worth nothing that the effect of outcome on emotion judgments was relatively nonconsequential. Regardless of whether outcomes were negative or positive, emotion attributions were stronger when the prior probability of the counterfactual outcome was high rather than low.

General Discussion

Participants saw scenarios where agents played a luck-based game. They then judged whether the counterfactual outcome (i.e., winning if the player lost, losing if the player won) was close—whether this outcome *almost* happened and whether it *easily* could have. Participants also predicted how the agents felt—whether losing agents were disappointed and winning agents were happy, and whether the agents were surprised. We wanted to know if these judgments work similarly depending on the direction of counterfactual comparisons—whether people make upward comparisons and consider how things could have been better, or instead make downward comparisons and consider how things could have been worse. Overall, the judgments worked similarly regardless of the direction.

To recap, let's first look at judgments about the two kinds of counterfactual closeness (Almost, Easily). These judgments differed from one another both when agents lost and won: Almost judgments were affected more than Easily judgments by the distance between the location the agent chose and alternative locations that would have produced the opposite outcome. Meanwhile, Easily judgments were affected more than Almost judgments by the prior probability of the counterfactual outcome. Also, when we directly compared upward (agent lost) and downward (agent won) situations in the final experiment, the effects of distance and prior probability were similar regardless of direction—the only difference was an overall tendency for greater Easily judgments in downward counterfactual comparisons than in upward ones.

With emotions, we took it as given that participants would predict that losing players would feel disappointed and that winning players would feel happy. We wanted to see if there are other differences between situations that elicit upward versus downward comparisons. We found that for both disappointment and happiness, and also for surprise, participants predicted stronger emotions when the prior probability of the counterfactual outcome was high than low. At the same time, the direction of the comparison did matter, as for all emotions the effect of prior probability was larger for losing than winning players. Emotion predictions also depended on the manipulation of distance, but the effects were very small.

Implications and Broader Questions

These findings join previous work in suggesting there are at least two kinds of counterfactual closeness, one depending more on the distance between reality and the counterfactual outcome, and the other depending more on the prior probability of the counterfactual outcome (Doan et al., 2023b). Our findings show this distinction is robust to the distinction between upward versus downward counterfactual comparisons, since previous studies

only looked at upward comparisons. Our findings also show that judgments of what almost happened relate to a novel form of distance—the gap between a chosen location and the location of options that would have changed the outcome. Some previous work on counterfactual closeness did used similar manipulations of distance, but that work either did not ask for Almost judgments, or manipulated distance together with propensity, which is also relevant to counterfactual closeness (Ong et al., 2015, 2021; Teigen, 1996; Wohl & Enzle, 2003; Wu et al., 2015, 2017).

At the same time, our findings do not fit with previous findings that the two kinds of counterfactual closeness are linked with different emotions (Doan et al., 2023b). In line with the earlier findings, prior probability of the counterfactual outcome more strongly affected predictions of surprise than those of disappointment. But contrary to the earlier findings, distance did not have a stronger effect on disappointment and happiness than on surprise.[3] In general, distance only had negligible effects on predictions about emotions, even though it did affect judgments about counterfactual closeness (especially Almost judgments).

One explanation for the difference in findings is that distance is only linked with happiness and disappointment when it is tied to propensity—that is, when people feel as though events had been building towards the counterfactual outcome (or when they attribute this feeling to the agent). Our scenarios are unlikely to have evoked any sense of propensity because when the agent chose a location, participants did not yet know which ones had winning and losing

[3] These conclusions were corroborated by exploratory analyses looking at patterns of correlation between participants' ratings of the emotions and of counterfactual closeness in the final experiment. In line with earlier findings, Easily ratings were more strongly correlated with surprise ($r = .55$) than with happiness and disappointment ($r = .28$), $p < .001$ (comparison of overlapping correlations). However, contrary to what earlier findings suggested, Almost ratings were also more strongly correlated with surprise ($r = .29$) than with happiness and disappointment ($r = .09$), $p < .001$.

items. Another possibility is that the relation to disappointment and happiness is restricted to specific kinds of distance. Whereas we looked at the distance between the chosen location and ones that would have given better or worse results, previous work looked at distance from a threshold (e.g., getting 5 items when 6 were needed for success).

Our experiments focused on games of chance, and so our results do not speak to situations involving skill. This could matter. Previous work suggests that upward and downward counterfactuals serve different functions (e.g., Markman et al., 1993; Roese, 1994; Roese & Olson, 1995; for theoretical overviews, see De Brigard, 2023; McMullen et al. 1995). Specifically, upward counterfactuals are thought to serve a preparatory function—thinking about how things could have gone better can help people see how to secure better outcomes when similar situations arise in the future (e.g., Hammell & Chan, 2016; Kray et al., 2009; Morris & Moore, 2000). Consistent with this, people who consider upward counterfactuals perform better on a second task than those who consider downward counterfactuals (e.g., Nasco & Marsh, 1999; Roese, 1994). By contrast, downward counterfactuals may chiefly allow people to feel good about their situation (e.g., Medvec et al., 1995; Medvec & Savitsky, 1997; Roese, 1994; Teigen & Jensen, 2011; Sweeny & Vohs, 2012).

But this difference in functions is unlikely to hold for true games of chance. After all, there is nothing to prepare for in luck-based situations that leave no room for control over the outcome. So perhaps our findings would differ if we instead looked at games of skill. That is, asking about such games might reveal greater differences between judgments about players who lose versus win. Alternatively, the preparatory function of counterfactual thinking could itself depend on counterfactual closeness. In situations involving skill, thinking about close counterfactual alternatives may serve a preparatory function regardless of whether one loses or

wins. For instance, if someone wins a game but recognizes that they almost lost, or easily could have, this might help them safeguard against that outcome in the future.

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