

BRIEF REPORT

Is Optimism Real?

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Is optimism real, or are optimistic forecasts just cheap talk? To help answer this question, we investigated whether optimistic predictions persist in the face of large incentives to be accurate. We asked National Football League football fans to predict the winner of a single game. Roughly half (the *partisans*) predicted a game involving their favorite team, and the other half (the *neutrals*) predicted a game involving 2 teams they were neutral about. Participants were promised either a small incentive (\$5) or a large incentive (\$50) for correctly predicting the game's winner. Optimism emerged even when incentives were large, as partisans were much more likely than neutrals to predict partisans' favorite teams to win. Strong optimism also emerged among participants whose responses to follow-up questions strongly suggested that they believed the predictions they made. This research supports the claim that optimism is real.

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Evidence for optimism abounds. People optimistically forecast task completion (Buehler, Griffin, & Ross, 1994), task performance (Camerer & Lovallo, 1999), health outcomes (Weinstein, 1980), political outcomes (Krizan, Miller, & Johar, 2010), and sporting outcomes (Massey, Simmons, & Armor, 2011). Despite this seeming abundance of evidence, there are good reasons to question whether optimistic predictions reflect true beliefs.

First, forecasts of controllable events, such as project completion times or competitive performance, may reflect strategic goal setting. People may falsely express optimism for controllable events because they believe that making optimistic forecasts will motivate them to improve their performance (Zhang & Fishbach, 2010). Second, statistical artifacts, such as base rate regression and scale attenuation, may underlie demonstrations of comparative optimism—optimistic predictions of the self relative to others (Harris & Hahn, 2011; Moore & Healy, 2008; Moore & Small, 2007). Harris and Hahn (2011) even suggested that “these statistical artifacts also raise questions about the very existence of a general, unrealistically optimistic bias” (p. 149).

Although these critiques are navigable—for example, by showing that optimism persists even when people are asked to predict

the absolute outcome of an uncontrollable event (Massey et al., 2011)—a third critique is more challenging: Since there is little cost to doing so, people may choose to respond optimistically even when they do not believe it. For example, a sports fan may predict that his favorite team will win an upcoming game not because he genuinely believes this but because of a low-cost desire to be loyal to his team. Is optimistic responding just cheap talk, or do people respond optimistically even when they are motivated to give accurate predictions?

One way to answer this is to investigate whether optimism persists in the face of large incentives for accuracy (Grether, 1980; Levitt & List, 2007). On this question the evidence is mixed. On the one hand, Armor and Sackett (2006) found more optimism for hypothetical than for real events, suggesting that optimism may be reduced or even eliminated by immediate consequences. On the other hand, Williams and Gilovich (2008) found that participants were as willing to bet on their own optimistic beliefs as they were on equally likely objective gambles, suggesting they truly believed their optimistic predictions.

A weakness of these studies, as well as others showing optimism in the face of incentives (Massey et al., 2011; Windschitl, Smith, Rose, & Krizan, 2010), is that the incentives were modest. Should we believe that people, free to wed predictions to their desires in the absence of incentives, suddenly decouple them in order to gain \$1? This seems unlikely, especially when desires are strong. Hence, the fundamental question remains: Is optimism real?

We answered this question by investigating whether optimistic predictions persist in the face of large incentives to be accurate. To accomplish this, we asked National Football League (NFL) football fans to predict the winner of a single game. Roughly half (the *partisans*) was asked to predict a game involving their favorite team, and the other half (the *neutrals*) was asked to predict a game

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involving two teams they were relatively neutral about. Predictions are optimistic if partisans are more likely than neutrals to predict the partisans' preferred team to win. To assess whether optimism reflects true beliefs, we also manipulated incentives. Participants were promised either a small incentive (\$5) or a large incentive (\$50) for a correct prediction. If optimistic responding is mere cheap talk, then a \$50 incentive should eliminate it.

Obviously, though, the persistence of optimistic predictions in the face of a \$50 incentive does not prove that optimism is genuine. It could be that although optimism persists when the incentive is \$50, it would not if the incentive were \$500 or \$5,000 or \$50,000. One can try to navigate this critique by collecting additional measures assessing whether or not participants were responding truthfully. By including such measures in our study, we were able to investigate whether optimism persisted even among the subset of participants who, by all indications, genuinely believed the predictions they made.

We investigated football predictions in this study because this domain offers important advantages. First, because football outcomes are uncontrollable and football predictions are noncomparative, optimistic responses in this domain cannot be explained by strategic goal-setting and statistical artifacts. Second, football outcomes are unambiguous, imminent, and transparently beyond the control of the experimenter (no participant could believe the experimenter has rigged the result) and thus easy to incentivize. Third, because football fans are knowledgeable about the games they are predicting, they are not simply guessing the correct answer (cf. Windschitl et al., 2010). Finally, this domain offers objective data indicating which team was better, conditional on everything known at the time the prediction was made, thus providing us with an unbiased assessment of decision quality. To our knowledge, sporting events with active betting markets are the only domains that offer all these important features.

Method

This report adheres to the requirements proposed by Simmons, Nelson, and Simonsohn (2011).

Participants and Recruitment

Approximately 2 weeks before the start of the 2010 NFL football season, we e-mailed a large panel that we use to conduct research, asking NFL football fans to complete a short web survey indicating their interest in participating in football-related research. This survey asked participants ($N = 1,317$) to indicate their e-mail address, their most and least favorite NFL football teams, how closely they followed NFL football (1 = *not at all*, 5 = *extremely*), how often they watch *Monday Night Football*, their name, ZIP code, country of residence, gender, birth month, and birth year. They also took a four-item quiz, asking them to recall the previous season's Super Bowl winner and loser, and the losers of the two conference championship games.

Those who completed this survey ($N = 1,153$) received a follow-up survey asking them to rate how much they like (1 = *strongly dislike*, 5 = *neutral*, 9 = *strongly like*) and know about (1 = *nothing*, 5 = *almost everything*) each NFL team. (Teams were randomly ordered.) They again indicated their most and least favorite NFL teams. We invited the 1,000 participants who indi-

cated the same favorite NFL team in both surveys to participate in the experiment described below.

Trading off budgetary concerns and statistical power, we decided in advance to stop collecting data once roughly 800 participants had completed it. We did so after 770 participants responded (53.6% male; $M_{\text{age}} = 34.9$ years).

Procedure

On the Thursday before Week 2's NFL games (played on Sunday and Monday), we e-mailed participants a survey asking them to predict the winner of one of those games. Participants did not know in advance which game they would be asked to predict.¹

This study featured a 2 (partisans vs. neutrals) \times 2 (\$5 vs. \$50 incentive) between-subjects design. Partisans predicted the winner of the game involving their favorite team. Neutrals predicted the winner of a game that involved neither their favorite nor least favorite team. Neutrals were matched to partisans, so that the proportion of partisans predicting each game was roughly the same as the proportion of neutrals predicting each game. Indeed, by design, the proportion of partisans versus neutrals distributed across the 14 games was nearly identical, $\chi^2(13) = 2.51, p > .99$ (see Table 1).

Participants in the \$5 (\$50) condition were told that they would win a \$5 (\$50) Amazon.com gift certificate for correctly predicting the game's winner. To be sure they understood this information, we instructed participants to type "I will win a [\$5 or \$50] gift certificate if I correctly predict the winner of the NFL game." All but three participants typed this or some variant of it. We included them in all analyses.

On the next page, participants were reminded of the reward for an accurate prediction, and they predicted the winner of their assigned NFL game. Participants could not change their prediction once they made it.

Assessing Whether Participants Truly Believed Their Predictions

Participants then answered 10 follow-up questions, each displayed on its own page. For brevity, we describe only the four measures we used to assess whether participants truly believed their predictions. We describe all measures in the supplemental materials.

Subjective probability. Participants were asked, "What do you think is the probability that the [predicted winner] will defeat the [predicted loser]?" The response options ranged from 0% to 100%, in 1% increments.

Surprise. Participants were asked, "Will you be more surprised if the [visiting team] wins the game or if the [home team] wins the game?" They answered on a 7-point scale, where 1 = *extremely surprised if the [visiting team] wins*, 4 = *not at all*

¹ Sixteen games were scheduled for that week. We eliminated two games from consideration because their large point spreads suggested predicting them was too easy (and hence too financially costly for us). All fans of the teams that played in these eliminated games were necessarily assigned to the neutral condition. Fans of these teams performed just as well as fans of other teams on the NFL quiz, $t(768) = -0.03, p = .98$, and were equal followers of NFL football, $t(768) = 1.27, p = .21$.

Table 1
Game Information

Superior team	Inferior team	Point spread	Superior-team partisans	Neutrals	Inferior-team partisans
Ravens	<i>Bengals</i>	2	6	15	10
<i>Vikings</i>	Dolphins	5.5	22	37	13
Eagles	<i>Lions</i>	6	17	25	8
<i>Falcons</i>	Cardinals	6.5	8	15	5
<i>Browns</i>	Chiefs	1.5	16	21	10
<i>Titans</i>	Steelers	5	7	41	36
<i>Panthers</i>	Buccaneers	3.5	9	14	5
<i>Raiders</i>	Rams	3.5	9	12	5
<i>Broncos</i>	Seahawks	3.5	10	21	12
Texans	<i>Redskins</i>	3	5	17	18
<i>Chargers</i>	Jaguars	7	14	13	3
Patriots	<i>Jets</i>	2.5	42	47	13
<i>Colts</i>	Giants	5.5	36	53	27
Saints	<i>49ers</i>	5.5	21	32	20

Note. Home teams are italicized.

surprised by either outcome, and 7 = extremely surprised if the [home team] wins.

Accuracy motivation. Participants were asked, “How motivated were you to make an accurate prediction?” They answered on a 7-point scale, where 1 = not at all motivated and 7 = extremely motivated.

Prediction strategy. Participants were asked, “Which of these statements best explains why you predicted the [predicted winner] to win the game?” The response options were (a) “I genuinely believe they will win the game,” (b) “I do not genuinely believe they will win, but I want them to win,” (c) “I do not genuinely believe they will win, but I want them to lose,” and (d) “I just guessed, because I don’t have any idea which team is going to win the game.”

Before conducting the analyses reported below, we decided to categorize participants as “true believers” only if they (a) indicated that their predicted winner had a greater than 50% chance of winning the game, (b) indicated they would be at least slightly more surprised if their predicted winner lost, (c) rated their accuracy motivation a 7 (extremely motivated) on the 7-point scale, and (d) indicated genuinely believing that their predicted winner would win the game.

Point Spreads

Odds makers in Las Vegas offer a point spread for each NFL game. The spread incorporates all known information in order to

offer the best prediction of the game’s point differential, and thus serves as an excellent normative standard against which to judge predictions (Simmons, Nelson, Galak, & Frederick, 2011). Most important for our purposes, the point spread defines the most likely winner (the superior team) and the most likely loser (the inferior team). A fully knowledgeable, unbiased person should predict superior teams to win games.

Results

True Belief Measures

The means and percentages in Table 2 make clear that most participants in all conditions expressed high confidence in their predicted teams and indicated being very motivated to give accurate predictions. In addition, as one might expect, compared with superior-team partisans, inferior-team partisans (a) estimated that their predicted teams had a lower probability of winning and (b) indicated being more surprised if their predicted team won. They also indicated reduced accuracy motivation. Finally, compared with those offered \$5 for an accurate prediction, those offered \$50 were more motivated to give an accurate prediction.

Optimism

Significantly more than half the partisans (78.4%) predicted their favorite teams to win, $\chi^2(1) = 131.11, p < .001$. This was

Table 2
True Belief Measures: Means and Percentages

Measure	Inferior-team partisans		Neutrals		Superior-team partisans	
	\$5	\$50	\$5	\$50	\$5	\$50
Subjective probability _P (%)	70.0	69.0	72.8	73.1	75.2	74.4
Surprise if predicted team wins _P (M)	3.0	3.2	2.6	2.7	2.6	2.7
Accuracy motivation _{P,I} (M)	5.9	6.5	6.1	6.4	6.1	6.7
Genuinely believing prediction (%)	76.6	84.6	82.9	81.3	86.5	85.6

Note. A P subscript denotes a significant main effect of Partisan. An I subscript denotes a significant main effect of Incentive. There were no significant Partisan × Incentive interactions.

true in both the \$5 (81.0%) and \$50 (75.7%) conditions ($ps < .001$), which did not differ from each other, $\chi^2(1) = 1.64, p = .20$.

However, partisans were more likely to be fans of superior teams (54.5%) than fans of inferior teams. Thus, on aggregate, partisans *should* predict their favorite teams to win, because they (and everyone else) should predict superior teams to win games. Hence, it is important to distinguish fans of superior teams (who should predict their favorite teams to win) from fans of inferior teams (who should not). Accordingly, all subsequent analyses partitioned participants into three groups: (a) superior-team partisans ($n = 222$), (b) neutrals ($n = 363$), and (c) inferior-team partisans ($n = 185$).² Analyses were logistic regressions, regressing predictions (1 = predicted superior team, 0 = predicted inferior team) on (a) Partisan, coded $-1, 0$, and 1 for inferior-team partisans, neutrals, and superior-team partisans, respectively; (b) Incentive, coded -1 and 1 for \$5 and \$50, respectively; and (c) the Partisan \times Incentive interaction. We report odds ratios (OR) for each regression.

Optimism is manifest if superior-team (inferior-team) partisans are more (less) likely than neutrals to predict superior teams to win. Figure 1 displays this result. There was a large and significant main effect of Partisan, indicating that optimism was strong overall ($OR = 4.80, SE = 0.69, p < .001$). Additional analyses showed that, compared with neutrals, superior-team partisans were significantly more likely ($OR = 4.54, SE = 1.37, p < .001$), and inferior-team partisans were significantly less likely ($OR = 4.91, SE = 0.96, p < .001$), to predict superior teams to win. There was no main effect of Incentive: Participants were as likely to predict superior teams when \$50 was at stake as when \$5 was at stake ($OR = 1.06, SE = 0.10, p = .54$). Although optimism diminished slightly in the \$50 condition, the Partisan \times Incentive interaction was not significant ($OR = 0.85, SE = 0.12, p = .25$). Importantly, within the \$50 condition, there was a highly significant effect of Partisan ($OR = 4.07, SE = 0.81, p < .001$), indicating rampant optimism even when the stakes were considerable.

This result supports the claim that optimistic predictions reflect true beliefs rather than cheap talk. But it is possible that \$50 is simply not enough incentive to motivate predictions people actually believe. To help resolve this issue, we analyzed the predictions of true believers, whose responses to four follow-up questions strongly implied that they believed the predictions they made ($n = 313; 41\%$; see Table 3). If optimism is just cheap talk, then true

Table 3
Number (and Percentage) of True Believers per Condition

Incentive	Inferior-team partisans	Neutrals	Superior-team partisans
\$5	29 (31%)	56 (31%)	38 (34%)
\$50	37 (41%)	94 (52%)	59 (53%)

believers should not respond optimistically, but Figure 2 shows that they did. Analyses yielded a significant main effect of Partisan ($OR = 3.27, SE = 0.74, p < .001$) and no other significant effects ($ps > .48$). Additional analyses showed that, compared with neutrals, superior-team partisans were significantly more likely ($OR = 2.33, SE = 1.00, p = .047$), and inferior-team partisans were significantly less likely ($OR = 3.92, SE = 1.29, p < .001$), to predict superior teams to win. Even within the \$50 condition, the effect of Partisan was significant ($OR = 2.86, SE = 0.84, p < .001$). Thus, optimism was evident even among those who, by all indications, truly believed their predictions.³

Discussion

If Kahneman (2011) is right that “in terms of its consequences, the optimistic bias may well be the most significant of the cognitive biases” (p. 255), then it is important to know whether the bias is real. The answer to this deceptively challenging question has eluded researchers, paving the way for a new generation of researchers to question the very existence of a bias that psychologists have been studying for more than 70 years (e.g., Harris & Hahn, 2011; Krizan & Windschitl, 2007; Moore & Healy, 2008; Vosgerau, 2010).

Although no investigation can definitively overcome all the challenges researchers face in trying to ensure that participants' responses reflect their true beliefs, we believe that our research presents the best answer to date to the question of whether optimistic biases persist among those who truly believe their predictions. The fact that optimistic forecasts persisted among those who (a) were paid \$50 for an accurate prediction and (b) gave every indication that they believed their predictions, strongly suggests that optimism is real and not merely cheap talk. At the same time, our investigation does not indicate that all optimistic responses are truthful. Participants were slightly less optimistic when \$50 was at stake than when \$5 was at stake (especially those who supported

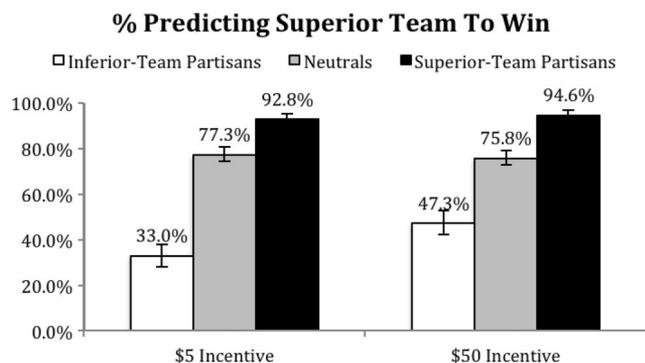


Figure 1. All participants: Predictions of a superior-team victory as a function of incentives and partisan status. Errors bars indicate 1 standard error.

² Point spreads of predicted games were the same for superior-team partisans ($M = 4.39$) and inferior-team partisans ($M = 4.38$), $t(405) = -0.10, p = .92$; this indicates that inferior-team partisans' favorite teams were as inferior as superior-team partisans' teams were superior.

³ We also analyzed these results using a different dependent measure (whether the participant predicted the home team to win the game) while controlling for team quality using a continuous measure (the point spread). Specifically, we regressed predictions on (a) Partisan (visiting-team partisan = -1 , neutral = 0 , and home-team partisan = 1), (b) Incentive, (c) the Partisan \times Incentive interaction, and (d) the Point Spread. Whether analyzing the entire sample or just the true believers, the effect of Partisan was highly significant ($ps < .001$), indicating significant optimism. The Incentive main effect and the Partisan \times Incentive interaction were nonsignificant in all analyses ($ps > .25$).

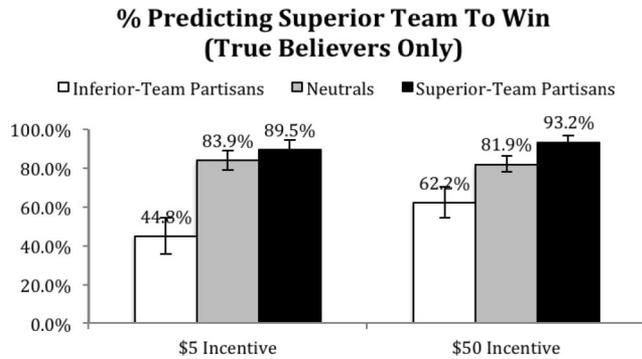


Figure 2. True believers: Predictions of a superior-team victory as a function of incentives and partisan status. Error bars indicate 1 standard error.

inferior teams), as were participants who met our strict definition of a true believer. Thus, it seems likely that a small but arguably nontrivial proportion of participants were willing to predict their favorite teams even though they did not fully believe those predictions.

Of course, the fact that this proportion exists does not alter our conclusion: Although some people may respond optimistically even when they do not believe it, it is most important that optimism is rampant even among those who do. As with research on social preferences (e.g., the ultimatum game; Cameron, 1999), demonstrating this bias under high-stakes conditions should shift the discussion from whether optimism is a real phenomenon to when and why it emerges.

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