Making detailed predictions makes predictions worse

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How to make good predictions

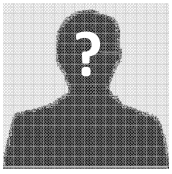
Inside View
Think about the event as unique
Ask: *What will happen* this time*?*

Outside View
Use base rates to make a prediction
Ask: *What* usually *happens?*

Buehler & Griffin (2002); Dunning (2007); Kahneman & Lovallo (1993); Kahneman & Tversky (1979); Lagnado & Sloman (2004); Lovallo & Kahneman (2003);

What affects inside-view vs outside-view thinking?

How unique the case feels.



Bar-Hillel (1983); Bar-Hillel (1990); Borgida & Brekke (1983); Dawes, (1996); Grove & Meehl (1996); Novemsky & Kronzon (1999);

Thinking about details makes the event feel unique

No details:
- How long will it take you to write your next paper?

With details:
- What will the paper be about?
- What will your schedule be like?
- How long will it take you to write the paper?

Kahneman & Tversky (1979)

Outside View

General Predictions → What *usually* happens?

Inside View

Detailed Predictions → What will happen *this time*?

Who will win an upcoming baseball game between the L.A. Angels and the L.A. Dodgers?

General Version
Who will win the game?
(Angels) Dodgers

Detailed Version
What will the final score be?
Angels 4 Dodgers 3

Yoon, S.O, Suk, K., Goo, J.K., Lee, J., & Lee, S.M. (2013). The devil is in the specificity: The negative effect of prediction specificity on prediction accuracy. *Psychological Science*.

Our goal is to answer four questions:

- Do detailed predictions actually make general predictions worse?
- If so, why?
- What kinds of detailed predictions make general predictions worse?
- Does making detailed predictions change your beliefs about *what usually happens*, or does it make you think that *this time will be different*?

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General Methods

20 experiments with…

11,246 participants making…

388,642 predictions about…

732 sporting events in the domains of…

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General Methods

Amazon Mechanical Turk participants predicted sports games.

Predicted either the **winning team**, or a **detailed prediction + winning team**.

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Winner Prediction

Friday, July 26th, 2013 @ 7:05 pm

New York Mets (45 wins, 53 losses) at Washington Nationals (49 wins, 53 losses)

Probable starting pitcher for the Mets: Matt Harvey
Probable starting pitcher for the Nationals: Ross Ohlendorf

If you correctly predict the winner of this game, you will earn $0.05

Who will win the game?

Mets ○ Nationals ○

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Score & Winner Prediction

Friday, July 26th, 2013 @ 7:05 pm

New York Mets (45 wins, 53 losses) at Washington Nationals (49 wins, 53 losses)

Probable starting pitcher for the Mets: Matt Harvey
Probable starting pitcher for the Nationals: Ross Ohlendorf

If you correctly predict the winner of this game, you will earn $0.05

How many runs will the **Mets** score? ☐
How many runs will the **Nationals** score? ☐

Who will win the game?

Mets ○ Nationals ○

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General Methods

Amazon Mechanical Turk participants predicted sports games.

Predicted either the **winning team**, or a **detailed prediction + winning team**.

Paid $0.05 per correct winning team prediction.

DV: % of participants predicting the team favored by well-calibrated betting markets to win.

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General Methods

Amazon Mechanical Turk participants predicted sports games.

Predicted either the **winning team**, or a **detailed prediction + winning team**.

Paid $0.05 per correct winning team prediction.

DV: % of participants making "wise" predictions.

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Good predictions are not always accurate predictions (and vice versa)

"A coin is biased to be 60% heads. Predict the next flip."

~~**Noisy measure: Did they get it right?**~~

Better measure: Did they predict heads?

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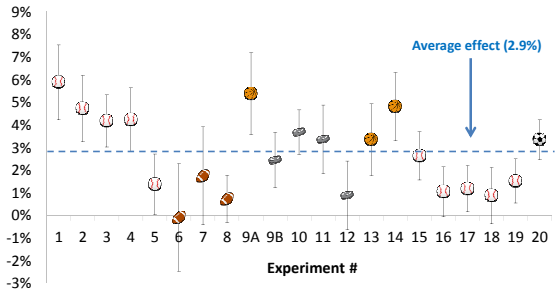
Difference in % participants making wise predictions between Winner and Score conditions
(experiments 1-20; n = 716 games)



$t(714) = 13.42$, $p < .001$.

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Does predicting other game details make winner predictions worse?

Relevant Detailed Predictions	Irrelevant Detailed Predictions
Hits & Winner (Experiments 4, 16, 18)	Time & Winner (Experiment 5)
Total Points & Winner (Experiments 4-8, 16, 18)	Crowd & Winner (Experiment 10)
Free Throws & Winner (Experiment 14)	Temperature & Winner (Experiment 14)

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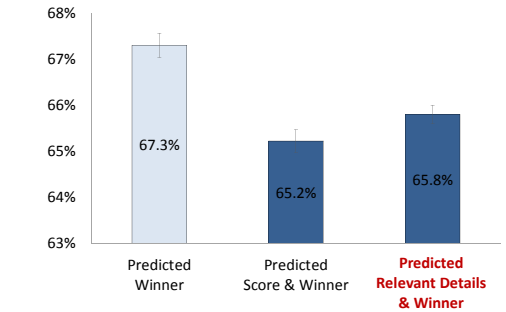
% participants making wise predictions
(Experiments 4-8, 14, 16, 18; n = 242 games)



$ts(241) > 4.72$, $ps < .001$.

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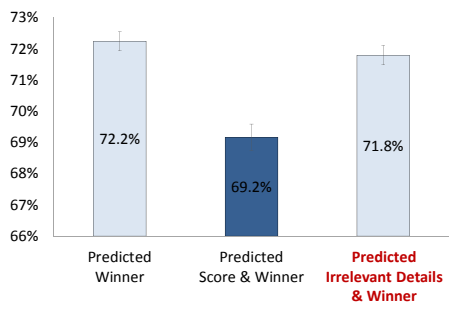
% participants making wise predictions
(Experiments 5, 10, 14; n = 104 games)



$ts(103) > 4.78$, $ps < .001$.

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Does predicting details change people's beliefs about *what usually happens* …

… or does it make them think that *this time will be different*?

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What will happen *this time*?

What would usually happen?

Predict **Winners** for all games

or

Predict **Scores** + Winners for all games

Predict the **usual outcome** for all games

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What would usually happen?

"For each game, we will ask you to **image that the two teams played <u>that exact game</u> 100 times.**

What we mean by 'that exact game' is that each of the 100 times the game is played, the game would begin with the <u>exact same starting conditions</u> as the actual game.

For example, the location and home team, the win/loss records of each team, the pitchers, the player lineup, player injuries, etc. <u>would all be the same at the beginning of each of the 100 games as they are at the beginning of the actual game</u>."

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(Experiments 15, 17, 19; n = 126 games)

Winner Prediction

Friday May 2nd, 2014 at 2:20 pm

St. Louis Cardinals @ Chicago Cubs

Team	Wins	Losses	Probable Pitcher
St. Louis Cardinals	15	14	Adam Wainwright
Chicago Cubs	9	17	Travis Wood

If you correctly predict the winner of this game, you will earn $0.05

Who will win this game?

St. Louis Cardinals ○ Chicago Cubs ○

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(Experiments 15, 17, 19; n = 126 games)

Score & Winner Prediction

Friday May 2nd, 2014 at 2:20 pm

St. Louis Cardinals @ Chicago Cubs

Team	Wins	Losses	Probable Pitcher
St. Louis Cardinals	15	14	Adam Wainwright
Chicago Cubs	9	17	Travis Wood

If you correctly predict the winner of this game, you will earn $0.05

What will the final score of this game be?

How many runs will the **St. Louis Cardinals** score? ____

How many runs will the **Chicago Cubs** score? ____

Who will win this game?

St. Louis Cardinals ○ Chicago Cubs ○

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Base Rate Prediction

Friday May 2nd, 2014 at 2:20 pm

St. Louis Cardinals @ Chicago Cubs

Team	Wins	Losses	Probable Pitcher
St. Louis Cardinals	15	14	Adam Wainwright
Chicago Cubs	9	17	Travis Wood

Imagine these two teams played <u>this exact game</u> 100 times.

How many games (out of 100) do you think the **Chicago Cubs** would win? ____

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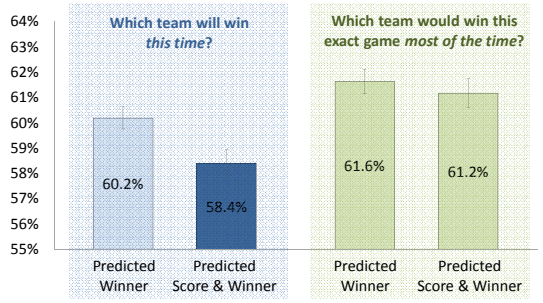
% participants making wise predictions
(Experiments 15, 17, 19; n = 126 games)



Winner and Base Rates vs. Score: *t*s(125) > 3.14, *p*s < .0021.

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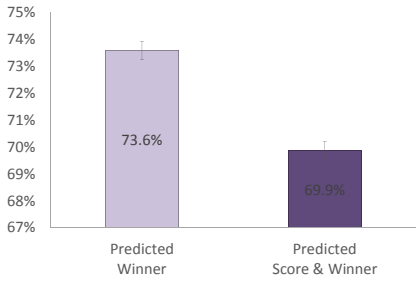
% participants predicting consistently with their own beliefs
(Experiments 15, 17, 19; n = 126 games)



t(125) = 7.62, *p* < .001.

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Summary of Findings

1) Predicting detailed outcomes makes predictions of more general outcomes worse.

2) Detailed predictions must be *relevant to how the event unfolds* to have this effect.

3) Making detailed predictions doesn't change your belief about what *usually happens*, but makes you more likely to think that *this time will be different*.

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Thank you!

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Experiment	Sport	N subjects	N games	Winner Only	Score Only	Score + Winner	Relevant + Winner	Irrelevant + Winner
1	MLB	316	41	67.3%$_a$	61.4%$_b$	-	-	-
2	MLB	508	39	73.3%$_a$	67.4%$_b$	69.7%$_c$	-	-
3	MLB	635	45	63.4%$_a$	57.9%$_b$	60.2%$_c$	-	-
4	MLB	631	45	70.8%$_a$	-	66.6%$_b$	66.8%$_b$	
5	MLB	634	42	60.1%	-	58.7%	58.8%	60.1%
6	NFL	607	14	65.5%	-	65.6%	66.5%	-
7	NFL	614	13	83.1%	-	81.4%	82.5%	-
8	NFL	611	13	84.0%	-	83.2%	83.4%	-
9a	NHL	298	30	72.0%$_a$	-	66.6%$_b$	-	-
9b	NBA	304	33	77.1%$_a$	-	74.7%$_b$	-	-
10	NHL	466	32	75.7%$_a$	-	72.0%$_b$	-	75.7%$_a$
11a	NHL	310	29	65.8%$_a$	-	62.7%$_b$	-	-
11b	NHL	309	29	53.5%$_a$	-	49.8%$_b$	-	-
12	NHL	595	26	77.9%	-	77.4%	-	-
13	NBA	632	33	74.4%$_a$	-	71.3%$_b$	-	-
14	NBA	617	32	85.5%$_a$	-	80.6%$_b$	83.6%$_{ac}$	83.9%$_c$
15	MLB	337	45	56.6%$_a$	-	53.9%$_b$	-	-
16	MLB	625	44	56.7%	-	55.7%	55.8%	-
17	MLB	422	41	60.9%	-	59.7%	-	-
18	MLB	728	45	59.3%	-	58.4%	58.5%	-
19	MLB	525	42	63.4%$_a$	-	61.8%$_b$	-	-
20	FIFA	622	48	61.2%$_a$	-	57.8%$_b$	-	-

Additional measures. Note that all additional measures were collected after all predictions were made in every experiment.

- Prediction Strategy (Experiments 3-13, 16, 18, 20)
- "Considerations" (Yoon et al., 2013; Experiments 1-20)
- Confidence (Experiments 3-20)
- Motivation (Experiments 3-20)
- Outcome variability (Experiment 16, 18)
- Outcome usefulness for predicting winner (Experiments 16, 18)
- Team liking (Experiment 20)
- Self-reported sports knowledge (Experiments 10-20)
- Self-reported sport following (Experiments 10-20)
- Measured Knowledge (Experiments 1-20)
- Sex & Age (Experiments 1-20)
- Instruction difficulty/confusion (Experiments 15, 17, 19)
- Optional contact for future studies (Experiments 1-20)

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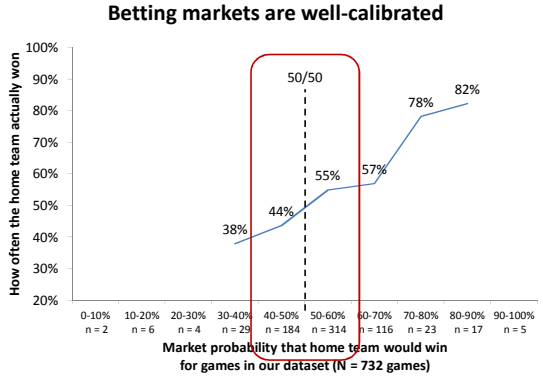

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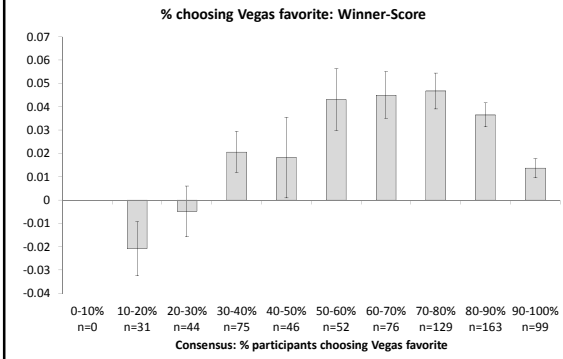

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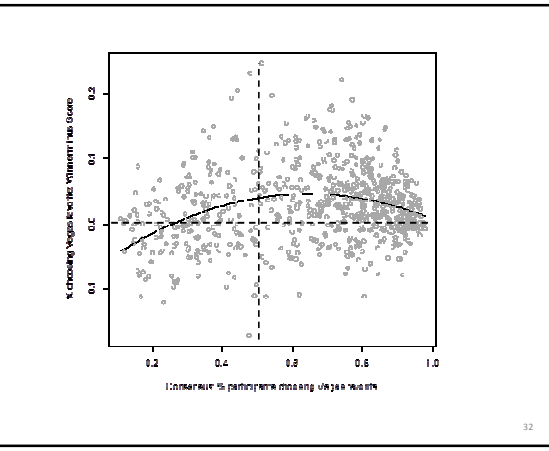

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(Experiments 4-8, 14, 16, 18; n = 242 games)

Predicted Winner: "Who will win this game?"

Predicted Score & Winner: "What will the final score of this game be?" + Winner Prediction

Predicted Hits & Winner: "How many hits will each team get?" + Winner Prediction (Experiments 4, 16, 18)

Predicted Total Points & Winner: "How many points will be scored by both teams during this game?" + Winner Prediction (Experiments 4-8, 16, 18)

Predicted Free Throws & Winner: "How many free throws will each team attempt?" + Winner Prediction (Experiment 14)

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(Experiments 5, 10, 14; n = 104 games)

Predicted Winner: "Who will win this game?"

Predicted Score & Winner: "What will the final score of this game be?" + Winner Prediction

Predicted Time & Winner: "How long will the game last?" [entered in hours and minutes] + Winner Prediction (Experiment 5)

Predicted Crowd & Winner: "What percentage of the crowd will be U.S. citizens?" + Winner Prediction (Experiment 10)

Predicted Temperature & Winner: "What will be the temperature outside of the arena at the start of the game?" + Winner Prediction (Experiment 14)

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