Slide 1

Sports Prediction

Slide 2

Why sports?

- Sports are real life
- Fun, interesting application area
- Big money
- Decisions under risk
- Decisions fast and slow
- Repeated predictions with incentives & quick feedback

Slide 3

GRAY MATTER

Force Overtime? Or Go for the Win?

By Jesse Walker, Jane L. Risen, Thomas Gilovich and Richard Thaler

Feb. 2, 2018

Slide 4

Green Bay Packers vs. Arizona Cardinals
Packers down by 1 pt, only minutes left

1 point kick → tie, overtime
- make later goal, win game in overtime
- opponent makes later goal, lose game in overtime

2 point conversion
- win game immediately
- lose game immediately

Myopic: overweight possibility of immediate loss

Slide 5

Sudden-Death Aversion

- In 47 NFL choices like this, teams kicked the extra point 42 times (89%)
  - Extra point → 40% chance of win [chosen 89% of time]
  - 2-point conversion → 50% chance of win [chosen 11% of time]
- Same thing in basketball
  - 2-point vs. 3-point shot in final seconds.
- Decision (in lab) based on prospect of immediate loss
  - Not on predictions about overtime performance

Slide 6

NFL

Success rate of NFL teams choosing to go for the extra point after scoring a touchdown when trailing by seven points near the end of the game. Note that each row includes the games from the rows below it. These data come from games that met the inclusion criteria from the 2004 to the 2013 seasons.

Time Remaining	Opportunities to go for two points	Extra-point attempts	Wins when extra point was attempted	% Choosing extra point	Winning % when choosing extra point
<= 3 minutes	47	42	17	89.4	40.5
<= 2 minutes	41	36	14	87.8	38.9
<= 1 minute	29	24	8	82.8	33.3
<= 30 seconds	24	20	6	83.3	30.0

NBA

Percentage of time home and visiting teams opted for a 3-point shot with various amounts of time left in the game during the final 24 seconds. Note that each row includes the shots from the rows below it. The data come from 778 shots that met the inclusion criteria from the 2011-12 to the 2015-16 seasons.

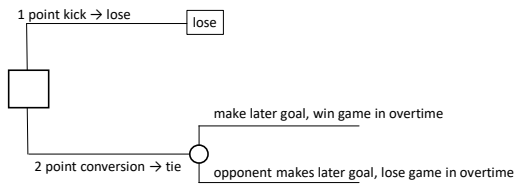| Time Remaining	n	Home Team	Visitors	Total
<= 24 seconds	778	28.5	29.4	29.9
<= 20 seconds	705	28.3	31.1	29.6
<= 16 seconds	637	29.2	32.6	30.8
<= 12 seconds	560	30.1	32.8	31.4
<= 8 seconds	469	33.3	37.7	35.4
<= 4 seconds	329	37.7	41.6	39.5

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Sudden-Death Aversion

- Wary of risks you are choosing to take
  - Less wary of risks you are forced to take
- Chance of making the play seems higher when it is your only option.

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Imagine the Packers were down by 2 pts

1 point kick → lose — lose

make later goal, win game in overtime

2 point conversion → tie — opponent makes later goal, lose game in overtime

Now the 2-point conversion seems less risky (less likely to fail).

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To Win a Sports Bet, Don't Think Too Much

Detailed analysis fogs the future

By Cindi May on July 23, 2013

Credit: Getty Images

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BIOLOGY
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Prediction Specificity Effect

PSYCHOLOGICAL SCIENCE

Research Article

The Devil Is in the Specificity: The Negative Effect of Prediction Specificity on Prediction Accuracy

Song-Oh Yoon, Kwanho Suk, Jin Kyung Goo, Jiheon Lee, and Seon Min Lee
Korea University Business School

Abstract
In the research reported here, we proposed and demonstrated the *prediction-specificity* effect, which states that people's prediction of the general outcome of an event (e.g., the winner of a soccer match) is less accurate when the prediction question is framed in a more specific manner (e.g., guessing the score) rather than in a less specific manner (e.g., guessing the winner). We demonstrated this effect by examining people's predictions on actual sports games both in field and laboratory studies. In Study 1, the analysis of 19 billion bets from a commercial sports-betting business provided evidence for the effect of prediction specificity. This effect was replicated in three controlled laboratory studies, in which participants predicted the outcomes of a series of soccer matches. Furthermore, the negative effect of prediction specificity was mediated by participants' underweighting of important holistic information during decision making.
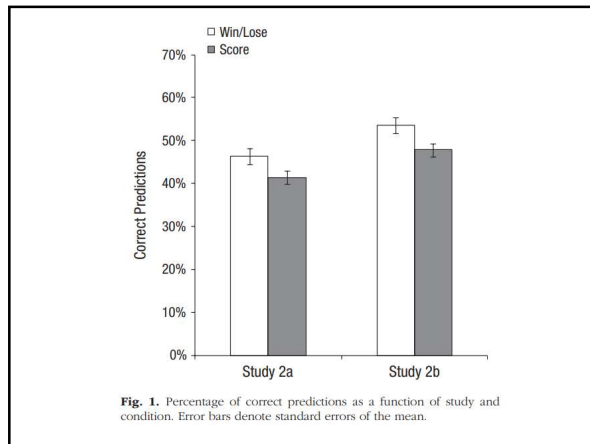
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Table 1. Results of Study 1: Percentage of Correct Predictions of Soccer Game Outcomes by Year, League, and Game Result

Game characteristic	Number of games	Win/lose bet (%)	Score bet (%)
All games	89	44.44 (2.74)	42.24 (2.15)
Year			
2008	32	45.27 (4.63)	42.18 (3.63)
2009	33	43.35 (4.56)	41.67 (3.57)
2010	24	44.84 (5.34)	43.09 (4.19)
Soccer league			
English	29	43.64 (4.84)	42.22 (3.79)
Korean	60	44.83 (3.36)	42.24 (2.63)
Game result			
Home team's win	34	50.98 (3.67)	47.93 (2.70)
Away team's win	27	58.47 (4.12)	54.51 (3.03)
Tie	28	22.99 (4.04)	23.50 (2.97)

Note: Standard errors of the mean are given in parentheses.

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Slide 13

Fig. 1. Percentage of correct predictions as a function of study and condition. Error bars denote standard errors of the mean.
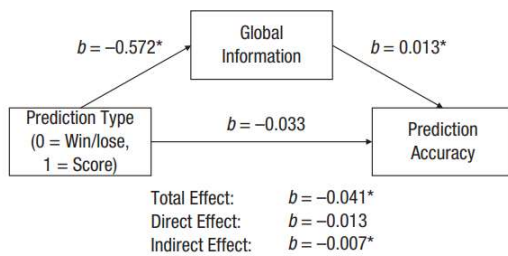
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How much were you influenced by

- global information
  1. overall performance of the two teams in the past years
  2. overall performance of the two teams in recent years
  3. overall impression of the two teams
- local information
  4. defense ability of the two teams
  5. offense ability of the two teams
  6. coaching ability of the two teams

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Slide 15

Mediation Analysis

$b = -0.572*$ Global Information $b = 0.013*$

Prediction Type (0 = Win/lose, 1 = Score) $b = -0.033$ Prediction Accuracy

Total Effect: $b = -0.041*$
Direct Effect: $b = -0.013$
Indirect Effect: $b = -0.007*$

Fig. 2. Results from Study 3: mediation model showing the influence of prediction type on prediction accuracy, as moderated by global information. Asterisks indicate significant paths ($p < .10$).

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Slide 16

ORGANIZATIONAL BEHAVIOR AND HUMAN DECISION PROCESSES 37, 93–110 (1986)

Factors Influencing the Use of a Decision Rule in a Probabilistic Task

HAL R. ARKES

Ohio University

ROBYN M. DAWES

University of Oregon

AND

CARYN CHRISTENSEN

Ohio University

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Slide 17

Curse of Expertise

- Study 2: Baseball (N=42)
- Choose MVP out of list of 3 based on
  - Batting average
  - # of home runs
  - RBI
  - Team standing
- Using team standing → 75% accuracy

- Participants were high or medium in baseball expertise
- Answered 19 questions + predicted % they got right

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Slide 18

Results

- Moderate knowledge Ss scored better (11.4) than high knowledge Ss (9.4).
- High knowledge Ss were more overconfident
- Moderate knowledge Ss reported using the rule more.

- Why?

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TABLE 2
INTERCORRELATIONS BETWEEN VARIABLES OF EXPERIMENT 2

Variables	(1)	(2)	(3)	(4)
Quiz score (1)	1.00			
Correct judgments (2)	−.40*	1.00		
Estimated correct judgments (3)	.32*	.08	1.00	
Extent of rule use (4)	−.47**	.58**	−.37*	1.00
Estimated minus actual corr. judgments (5)	.53**	−.64**	.71**	−.69**

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END

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Slide 21
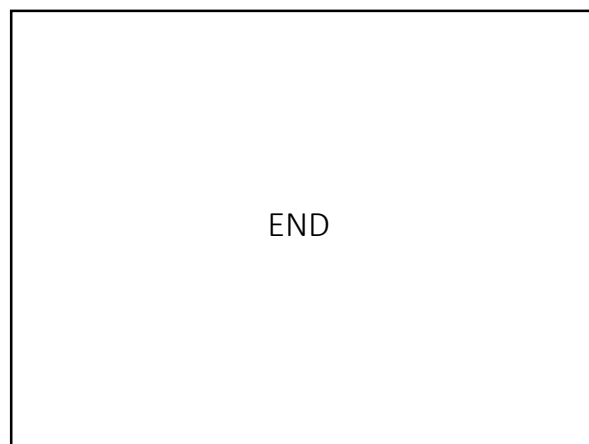
Choiceology: Season 3 Episode 2

CHOICEOLOGY
charlesschwab

Choiceology with Katy Milkman | S3:EP2
Hitting Your Number: With Guests Jason Beck …

00:00   33:24
1X

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Round-number goals are arbitrary but effective.

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Slide 22

Roger Bannister, First Runner To Break 4-Minute Mile Mark, Dies At 88

March 5, 2018 · 2:43 AM ET

DOREEN MCCALLISTER

On May 6, 1954, Britain's Roger Bannister hits the tape to become the first person to break the 4-minute mile in Oxford, England. His family said Sir Roger Bannister died peacefully in Oxford on March 3 at age 88.
AP

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Slide 24

**Round Numbers as Goals:
Evidence From Baseball, SAT Takers,
and the Lab**

Devin Pope[1] and Uri Simonsohn[2]
[1]The Booth School of Business, University of Chicago, and [2]The Wharton School, University of Pennsylvania
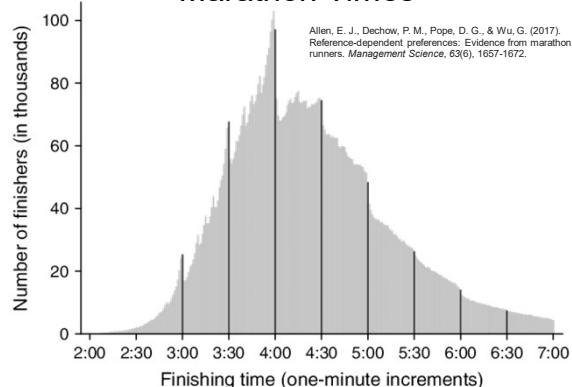
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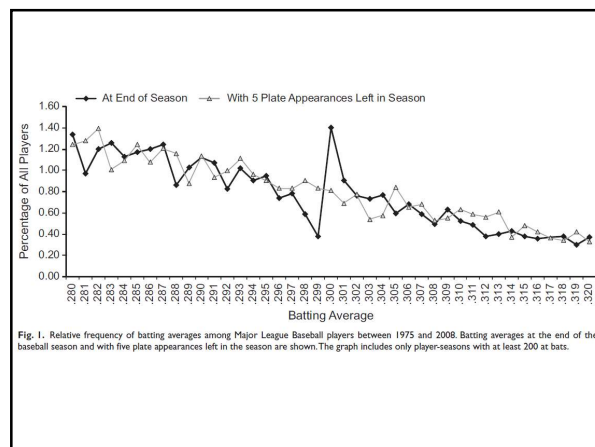### Round Numbers as Goals
Pope & Simonsohn (2011)

- Baseball players more likely to end the season with batting averages of .300 rather than just below
- Students more likely to re-take the SATs if they score just below a round number than if they score just above

- Round numbers act as cognitive reference points
- If performance falls below that reference, people are motivated to improve
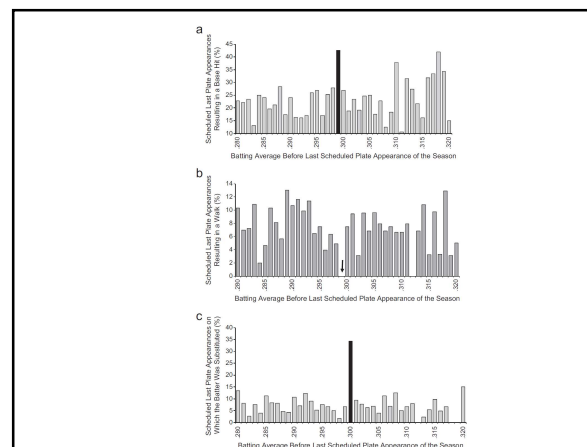
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Slide 26

Marathon Times

Allen, E. J., Dechow, P. M., Pope, D. G., & Wu, G. (2017). Reference-dependent preferences: Evidence from marathon runners. *Management Science*, *63*(6), 1657-1672.

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Slide 27

Fig. 1. Relative frequency of batting averages among Major League Baseball players between 1975 and 2008. Batting averages at the end of the baseball season and with five plate appearances left in the season are shown. The graph includes only player-seasons with at least 200 at bats.

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Slide 29

Fig. 3. Distribution of SAT scores of high school juniors and seniors. Only the final SAT score for each student was included in this data set.

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Fig. 4. Ratios of relative frequencies between consecutive SAT scores, for high school juniors and seniors.
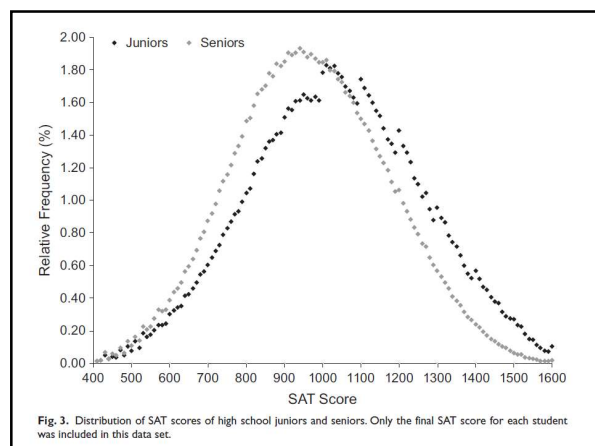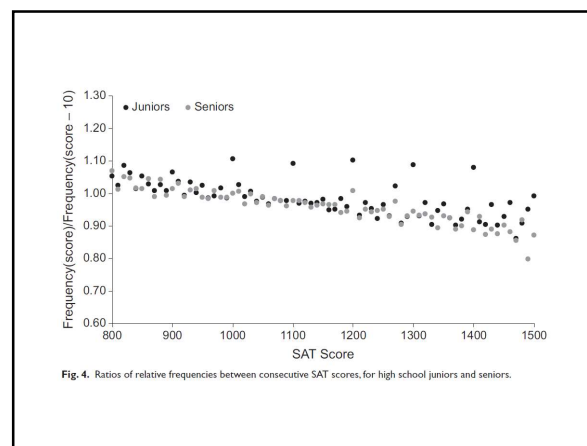
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What does decision research have to offer sports?

What does sports have to offer decision research?

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