Declined Options as Reference Points: Evidence from the Field

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Sunk costs

Arkes & Blumer, 1985; Shefrin & Statman, 1985; Thaler & Johnson, 1990; Odean, 1998; Genesove & Mayer, 2001

Declined options

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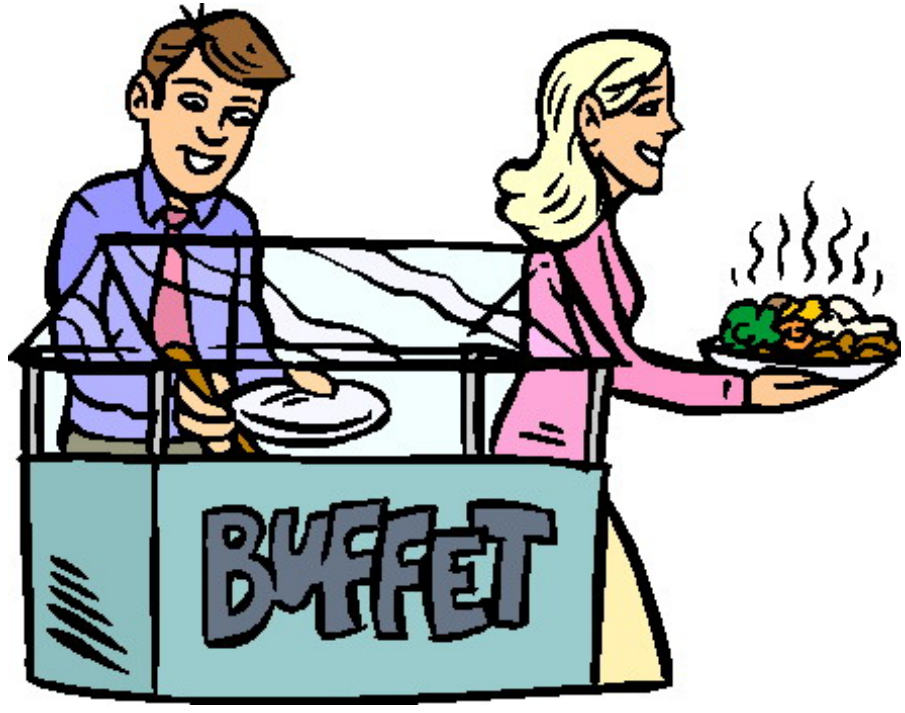
3. Anticipate regretting losses.
   (Camille et al, 2004; Coricelli et al, 2005)
4. Avoid anticipated regret.
   (Zeelenberg, 1999)

Labor supply

Consumption



Design and difficulties

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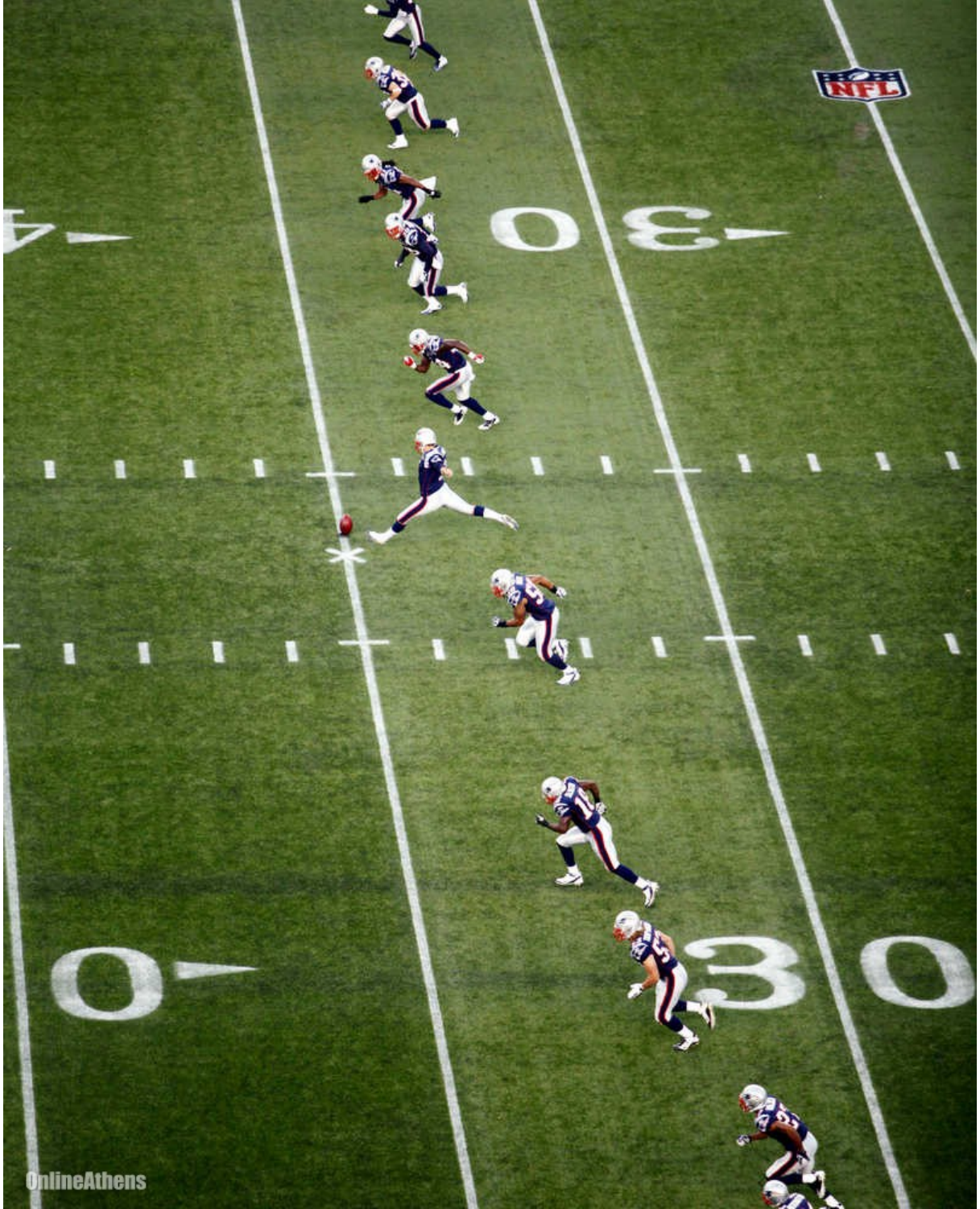
Solution:

1. Natural experiment with quasi-random assignment of option.
2. Option is almost always declined.


NFL
30
30
OnlineAthens


NEW ORLEANS
SUPER BOWL XLVII NEW ORLEANS
SUPER BOWL XLVII
Allstate
Ochsner
RAVENS
-10
-20
-30
-40

Data

- Play-by-play data from NFL kickoffs (2000-10).
  - Yard line where kickoff is fielded.
  - Touchback decision, if fielded in end zone.
  - Yard line where returner is tackled, if kickoff is returned.

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  - Yard line where returner is tackled, if kickoff is returned.
- Restrict to kickoffs fielded within 2 yards of goal line.
- 98% of kickoffs fielded from just inside the goal line are returned.

Results

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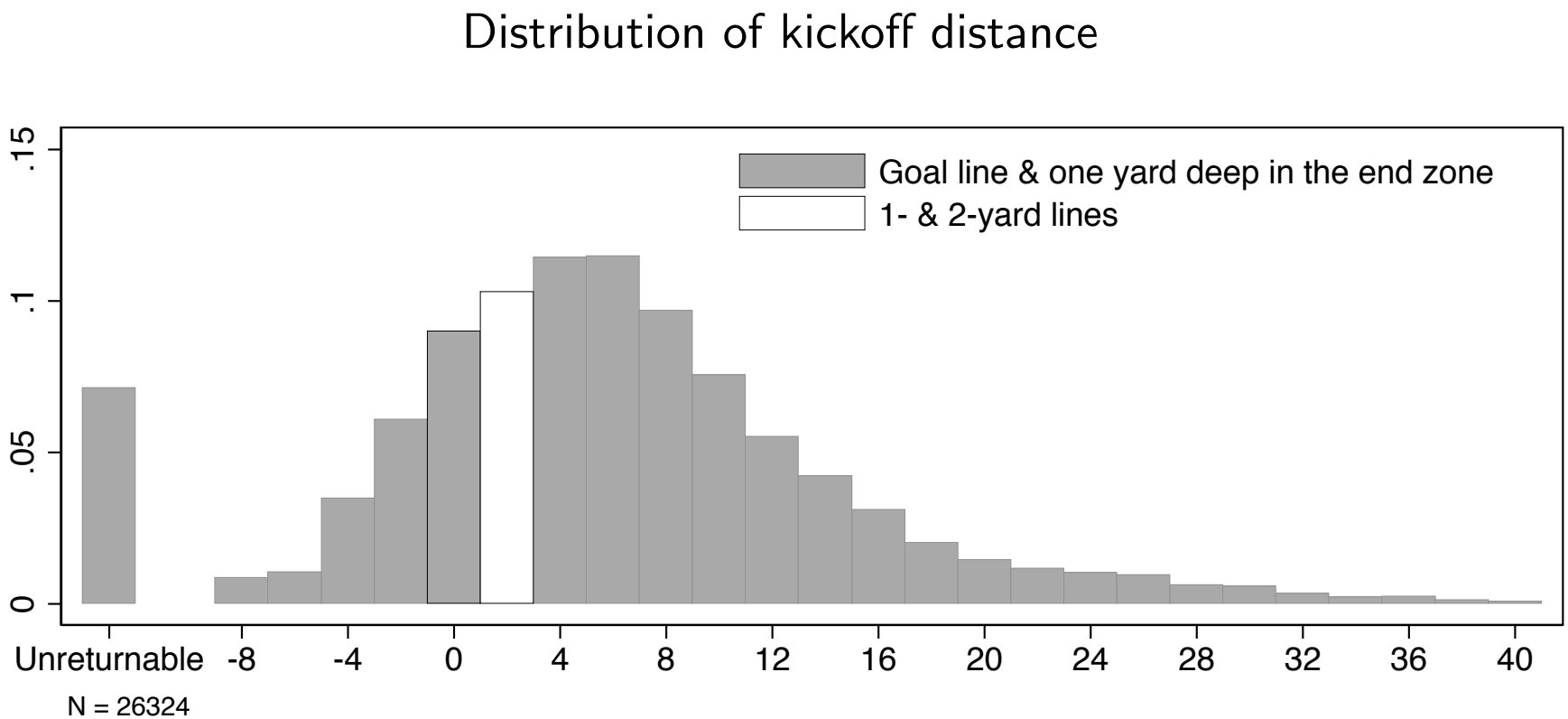
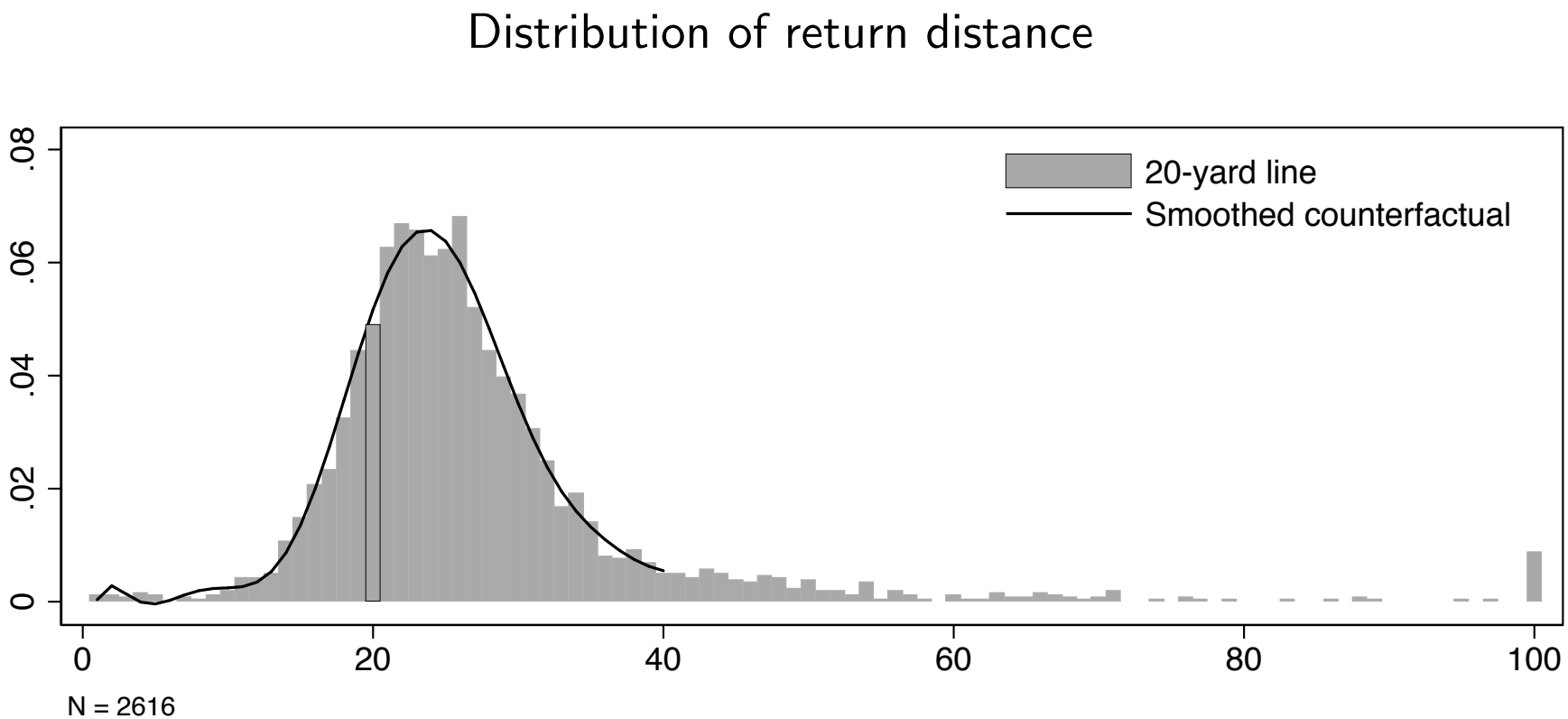
Returners who decline the touchback option are 56% more likely to achieve the 20-yard exactly.

Consistent with loss aversion around the counterfactual outcome of declined option.

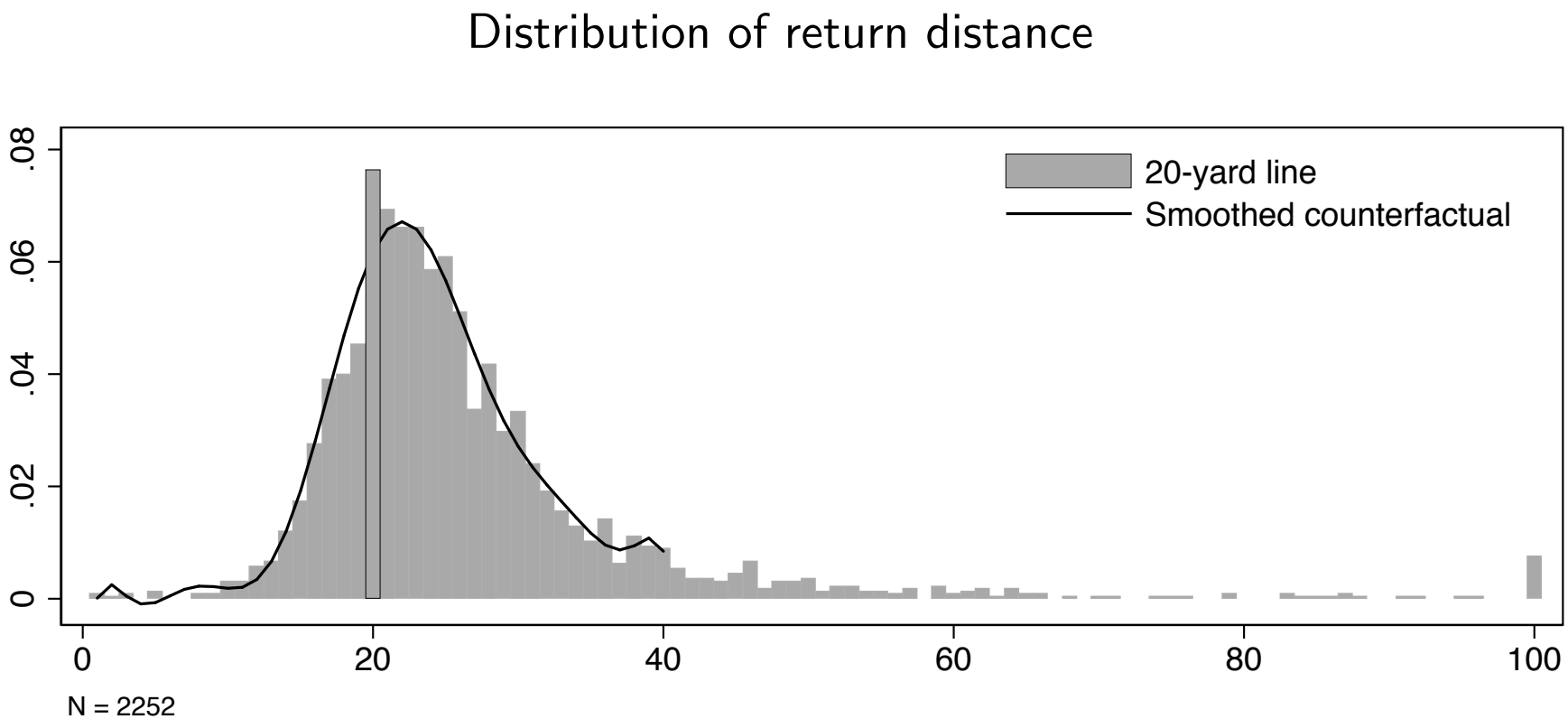
No evidence of manipulation near boundary



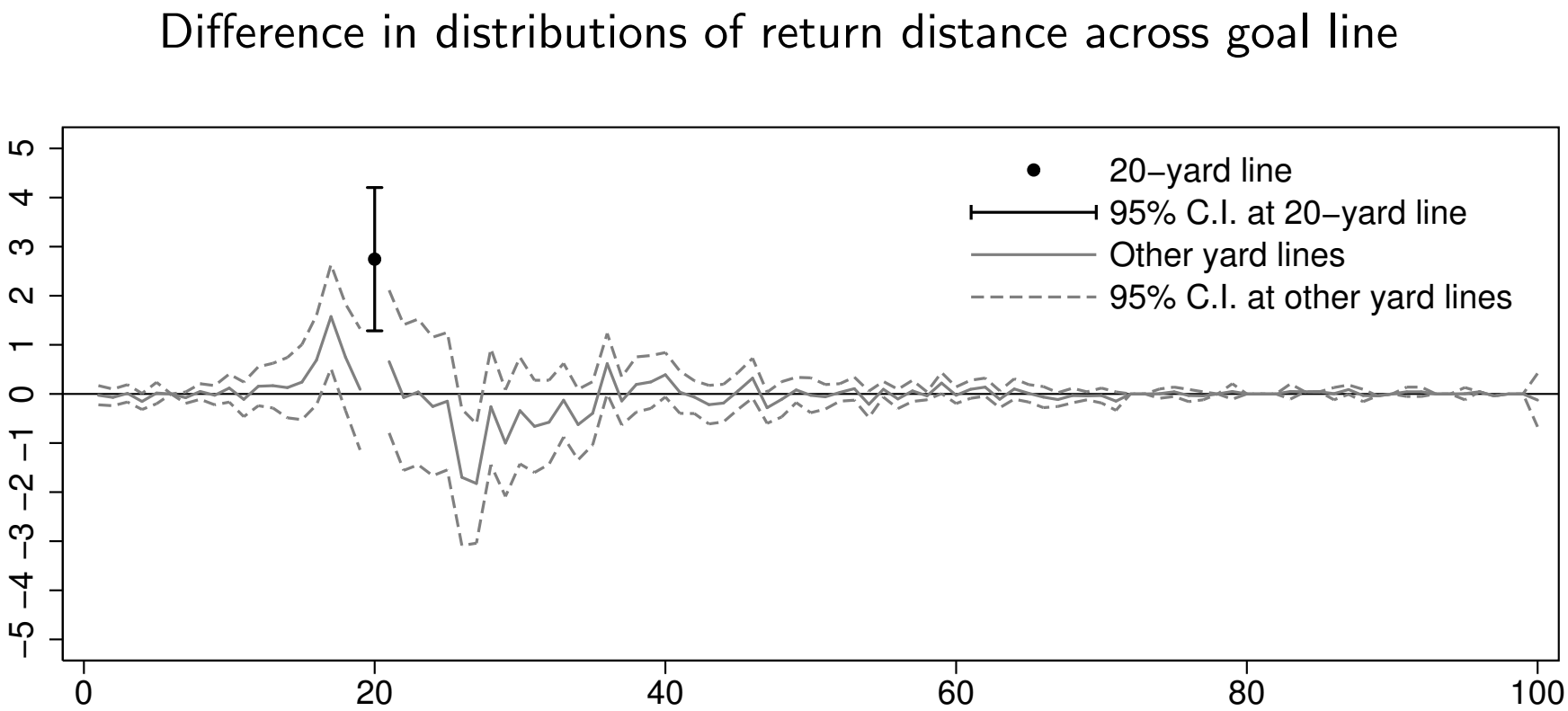
Returns from 1- & 2-yard lines



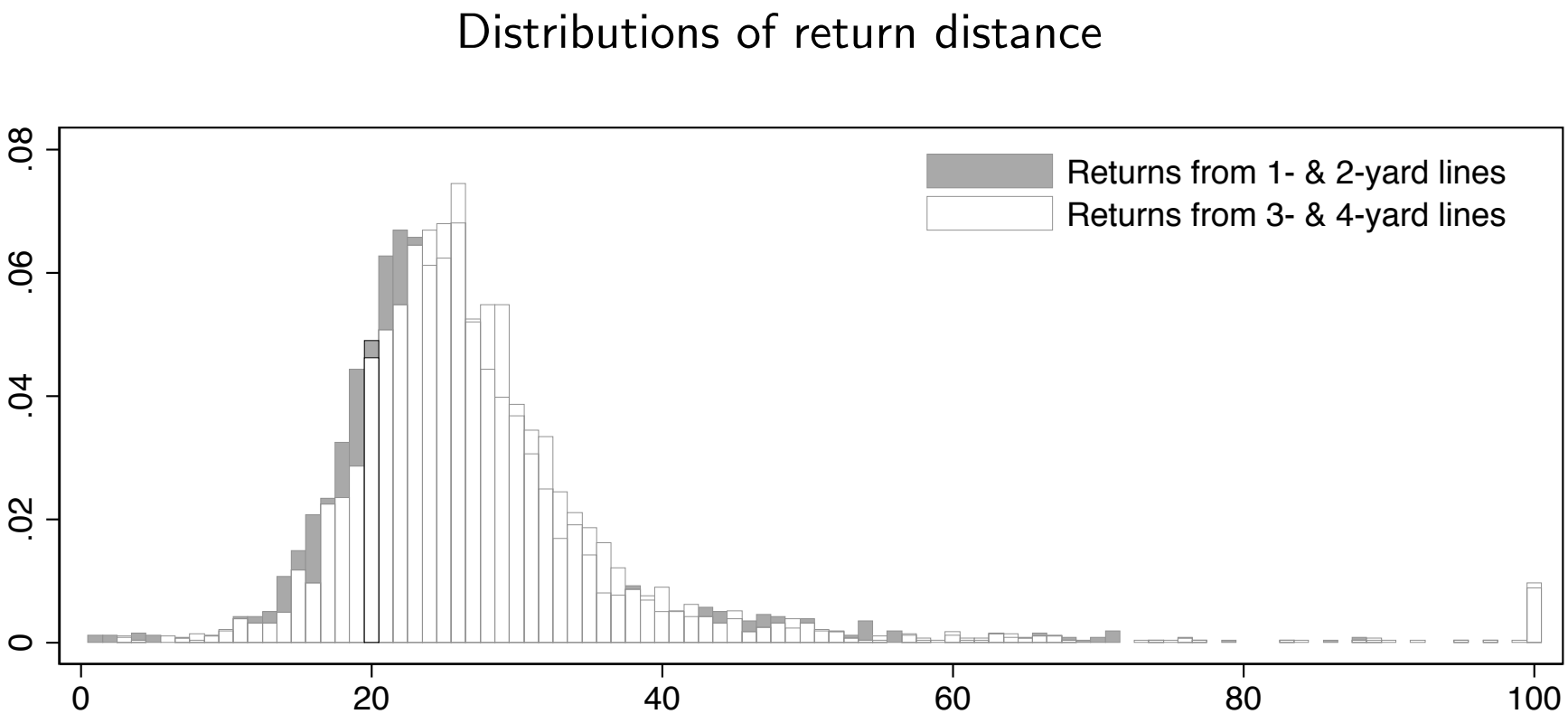
Returns from goal line & 1 yard deep in end zone



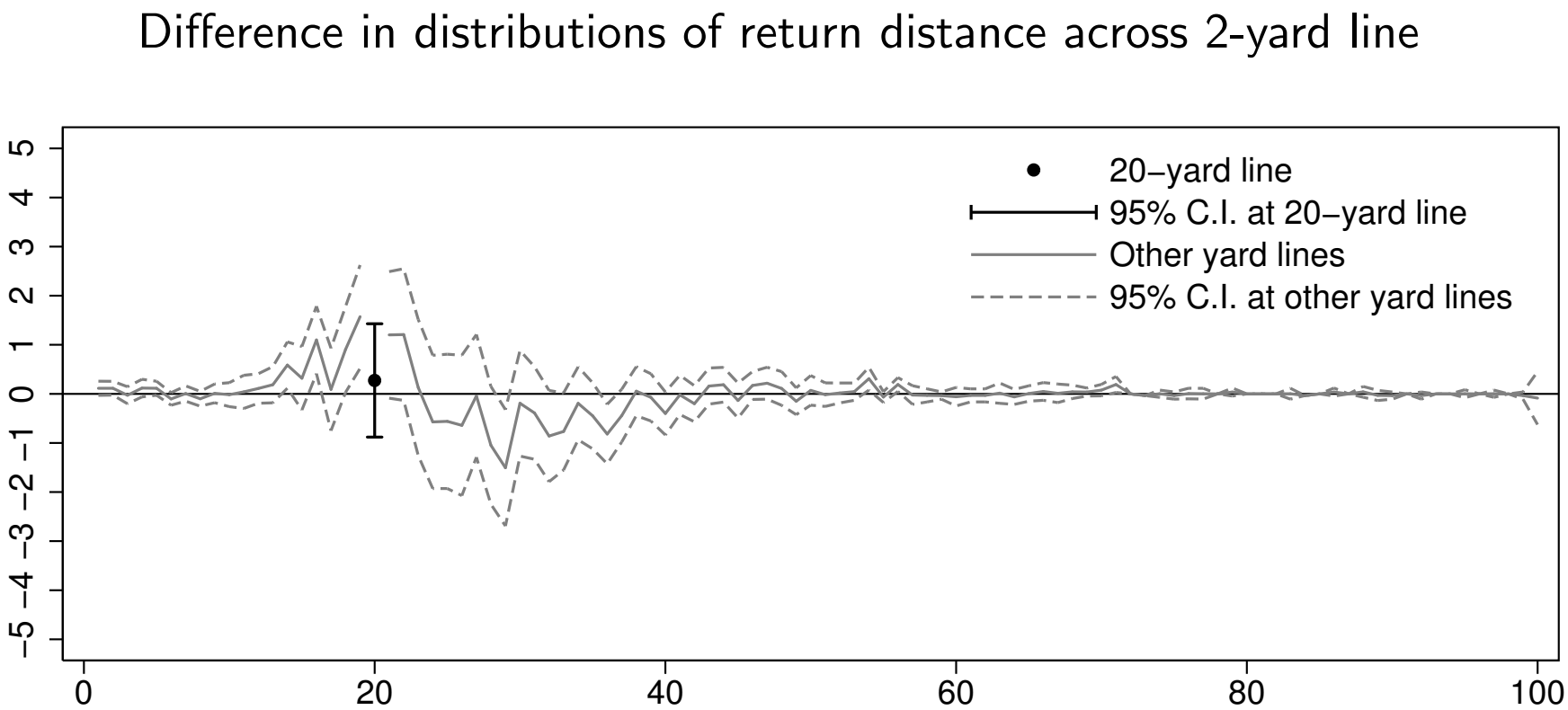
Treatment effect



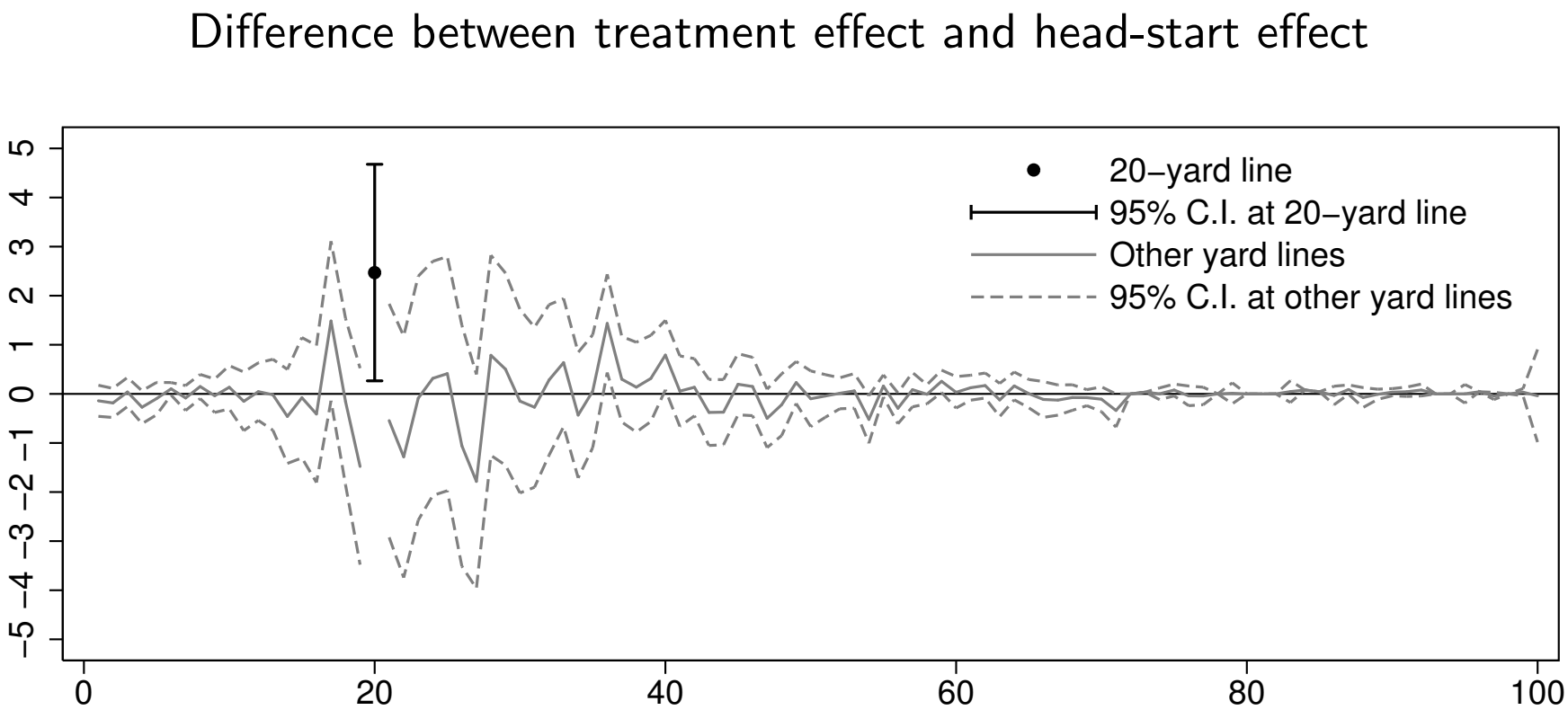
Head start


Distributions of return distance
Returns from 1- & 2-yard lines
Returns from 3- & 4-yard lines
0
.02
.04
.06
.08
0
20
40
60
80
100

Head-start effect



Difference in difference



Interpretations

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   - Loss-averse effort provisioning, with diminishing sensitivity, by returner around counterfactual outcome of declined option.

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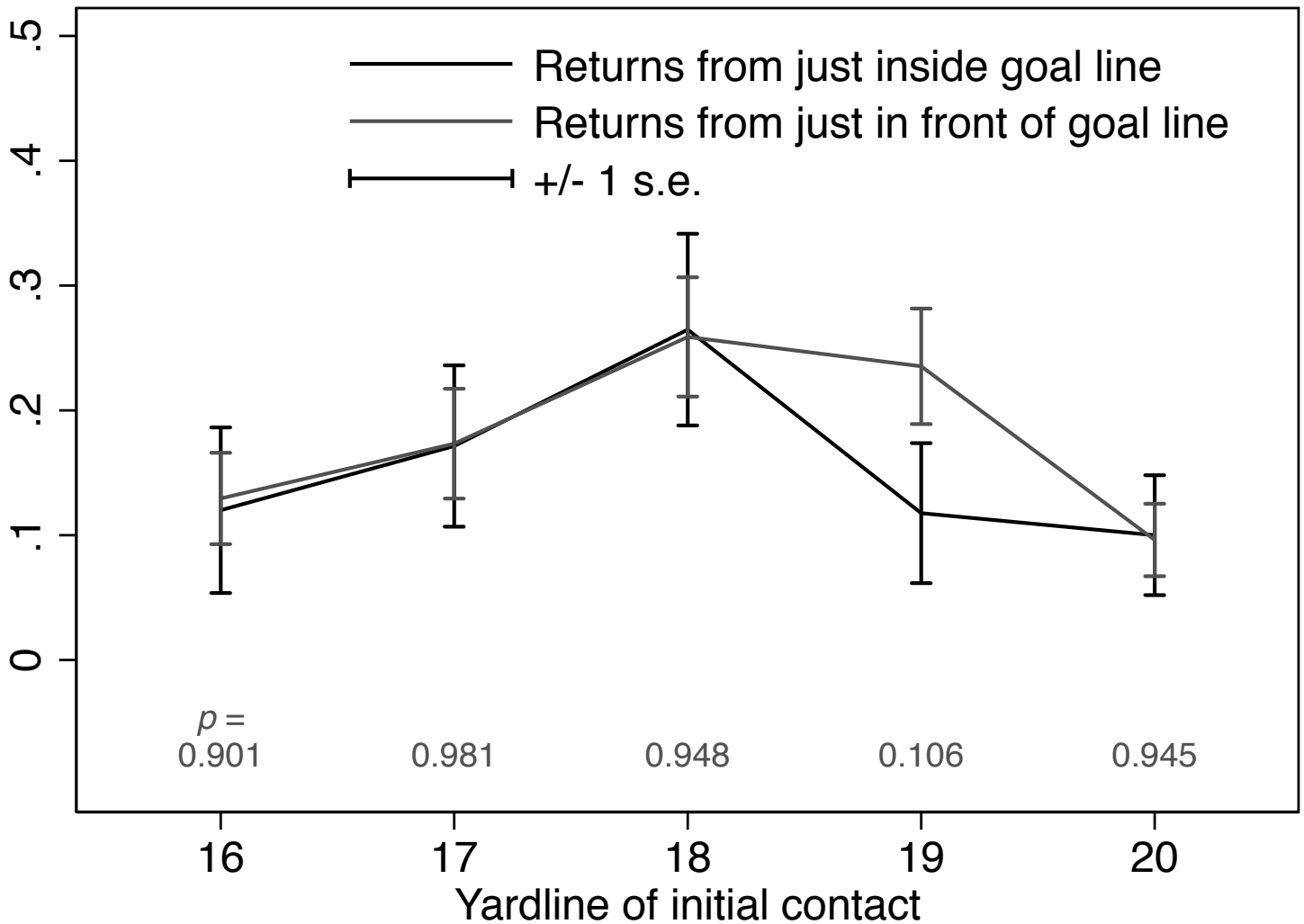
3. Mercy by game officials.

Appendix

Falling forward for a yard

$P(\text{tackle at 20} | \text{initial contact at } y)$ for returns within 2 yards of goal line



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- R and K run towards each other until contact

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- At contact, R and K simultaneously choose effort $e \in \{H, L\}$
  - $e_R = H \Rightarrow \downarrow P(\text{tackle}|\text{contact})$; $e_K = H \Rightarrow \uparrow P(\text{tackle}|\text{contact})$
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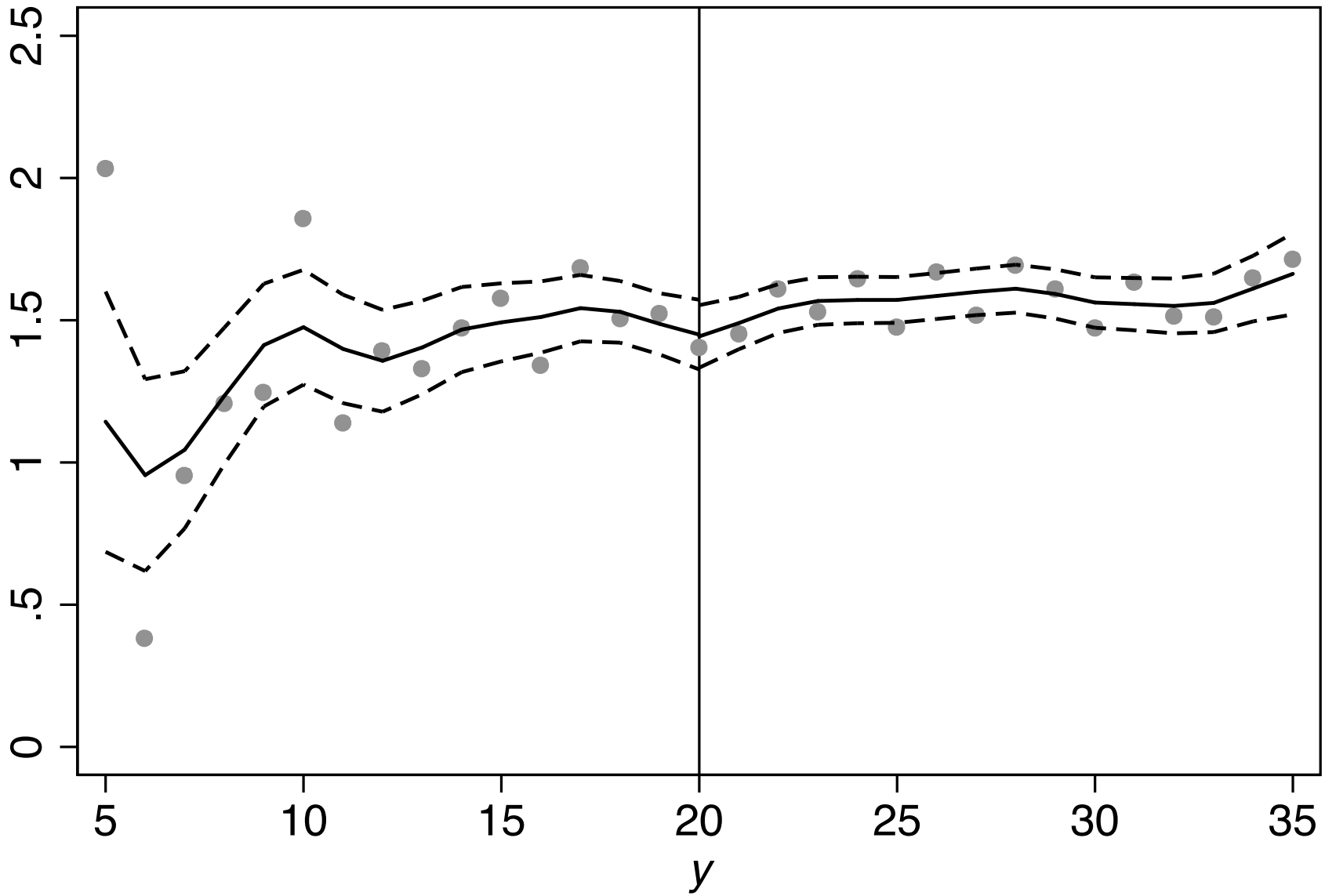
  - e^H is costly
- Find $\{e_R^*, e_K^*\}$ at each yard line of contact given preferences over y

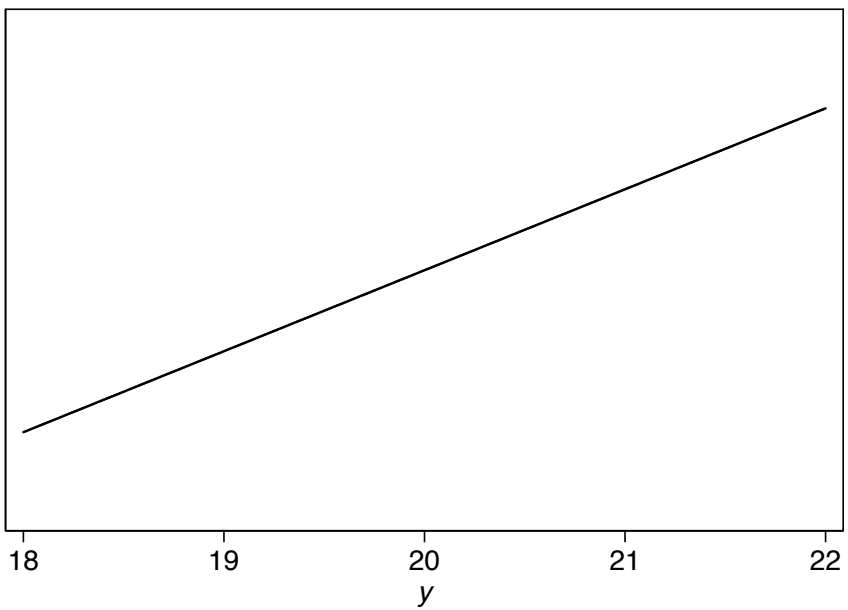
Normative preferences

Average number of points scored on drives that start at y.

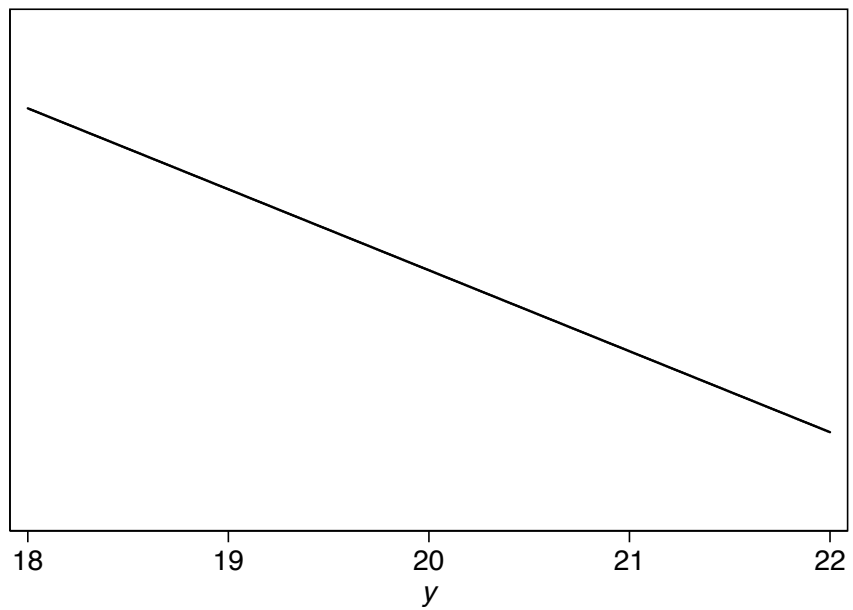


Reference-independent (RI) value function

$$b_R^{RI}(y) = m(y - 20)$$



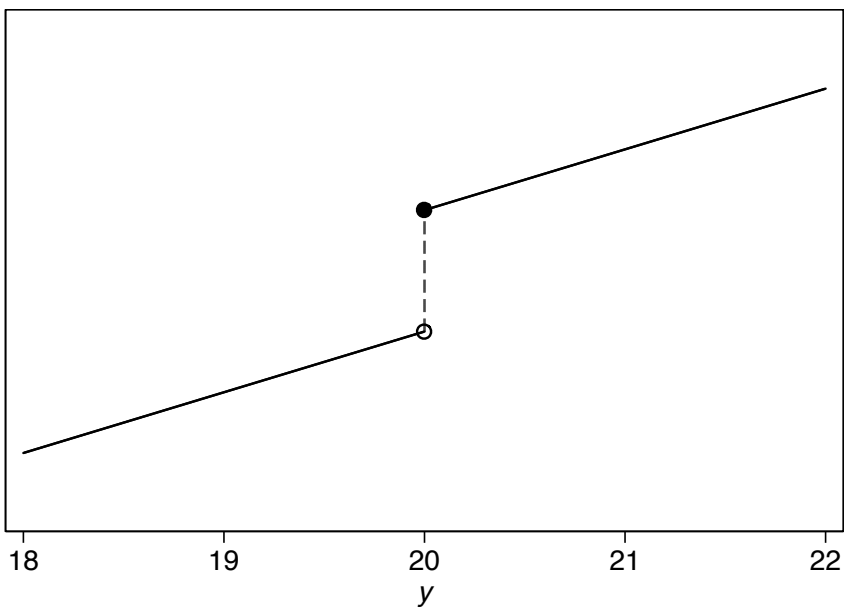
$$b_K^{RI}(y) = m(20 - y)$$

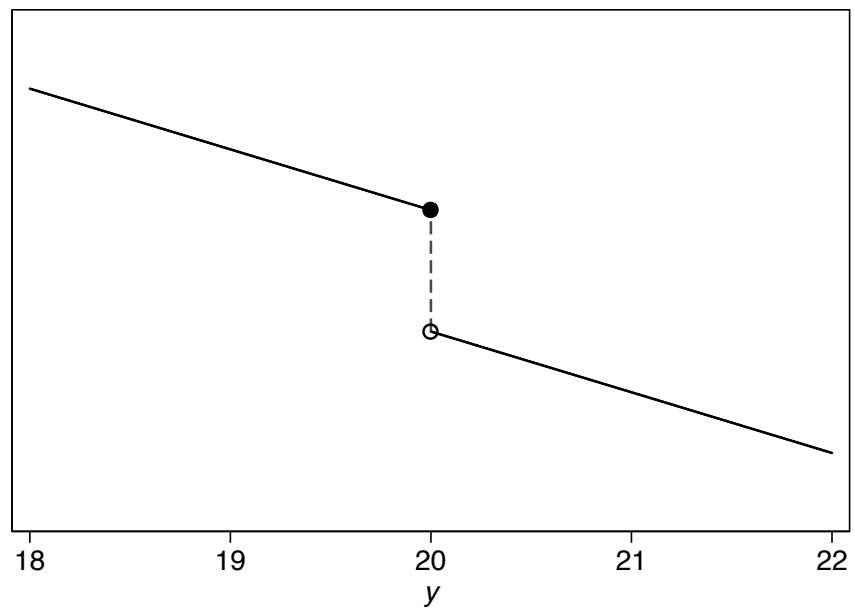


Loss-averse (LA) value function

$$b_R^{LA}(y) = \begin{cases} m(y-20) & y \geq 20 \\ m(y-20) - \Delta & y < 20 \end{cases}$$

$$b_K^{LA}(y) = \begin{cases} m(20-y) - \Delta & y > 20 \\ m(20-y) & y \leq 20 \end{cases}$$





Nash equilibrium effort levels

Equilibrium effort levels $\{e_R, e_K\}$

		Yard line of contact			
b_R	b_K	18	19	20	21
RI	RI	$\{L, L\}$	$\{L, L\}$	$\{L, L\}$	$\{L, L\}$

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LA	RI	$\{L, L\}$	$\{H, L\}$	$\{L, L\}$	$\{L, L\}$

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2. If $R \to$ LA and $K \to$ RI, $P(\text{tackle at } y)$ jumps at 20 from left.

Predictions

1. If $R \to$ RI and $K \to$ RI, P(tackle at y) is "smooth" at the 20.
2. If $R \to$ LA and $K \to$ RI, P(tackle at y) jumps at 20 from left.
3. If $R \to$ RI and $K \to$ LA, P(tackle at y) jumps at 20 from right.

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2. If $R \to$ LA and $K \to$ RI, P(tackle at y) jumps at 20 from left.
3. If $R \to$ RI and $K \to$ LA, P(tackle at y) jumps at 20 from right.
4. If $R \to$ LA and $K \to$ LA, P(tackle at y) spikes at 20.

Loss aversion by R or K?

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γ_K : displacement from 21- to 20-yard line

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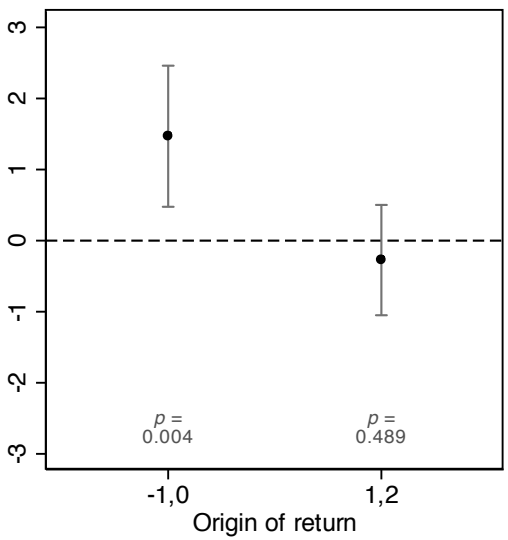
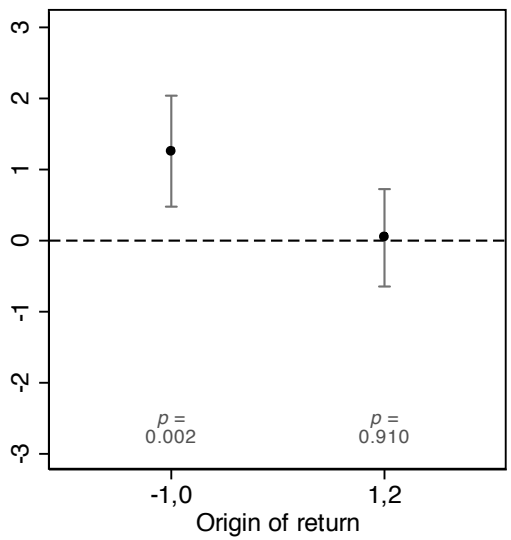
$$\gamma_R = \frac{1}{3}(\delta_{21} + \delta_{20} - 2\delta_{19}) \qquad \gamma_K = \frac{1}{3}(\delta_{19} + \delta_{20} - 2\delta_{21})$$

Mass displacement estimates

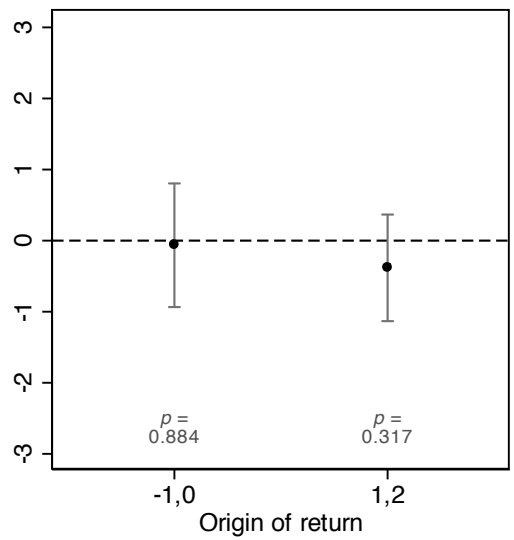
(a) $\hat{\delta}(20)$, $p = 0.007$



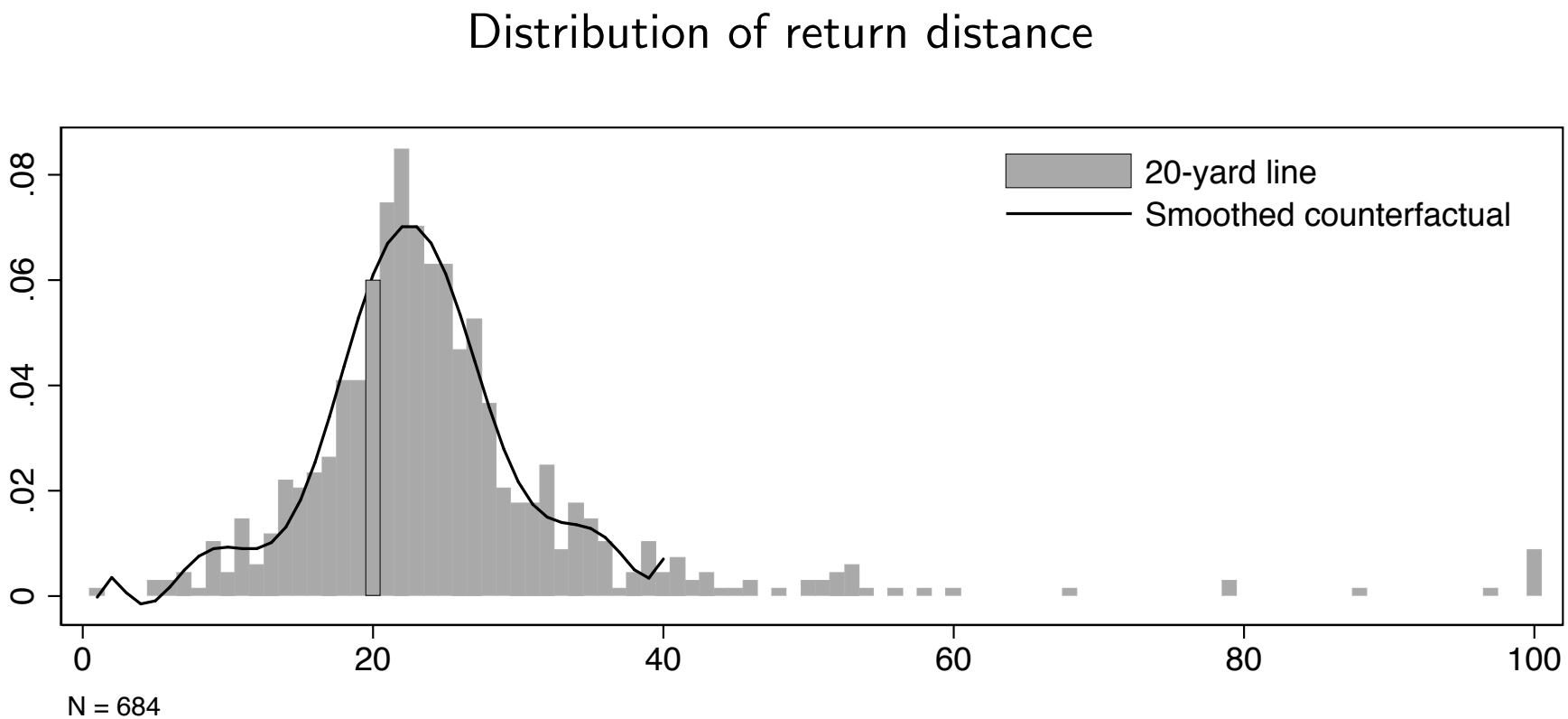
(b) $\hat{\gamma}_R$, $p = 0.021$



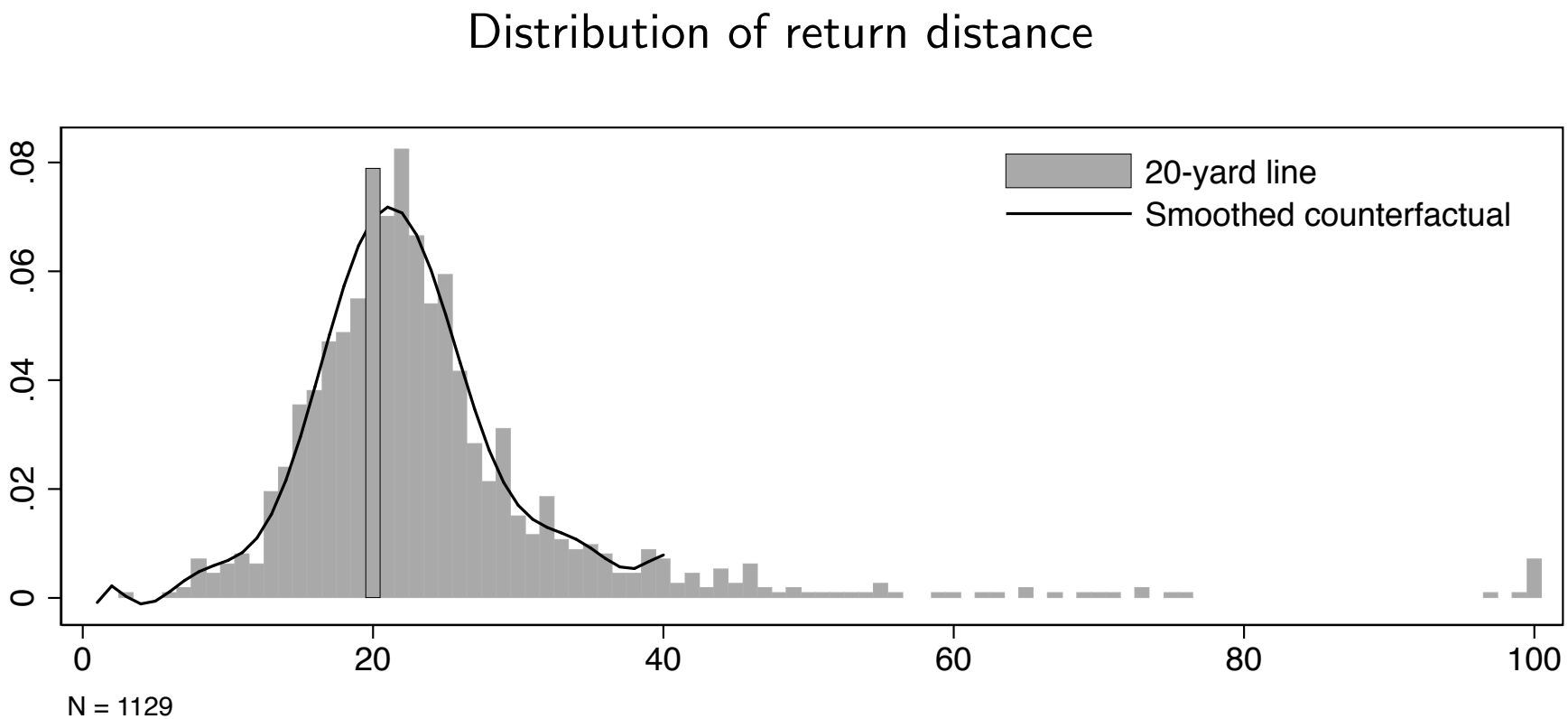
(c) $\hat{\gamma}_K$, $p = 0.587$



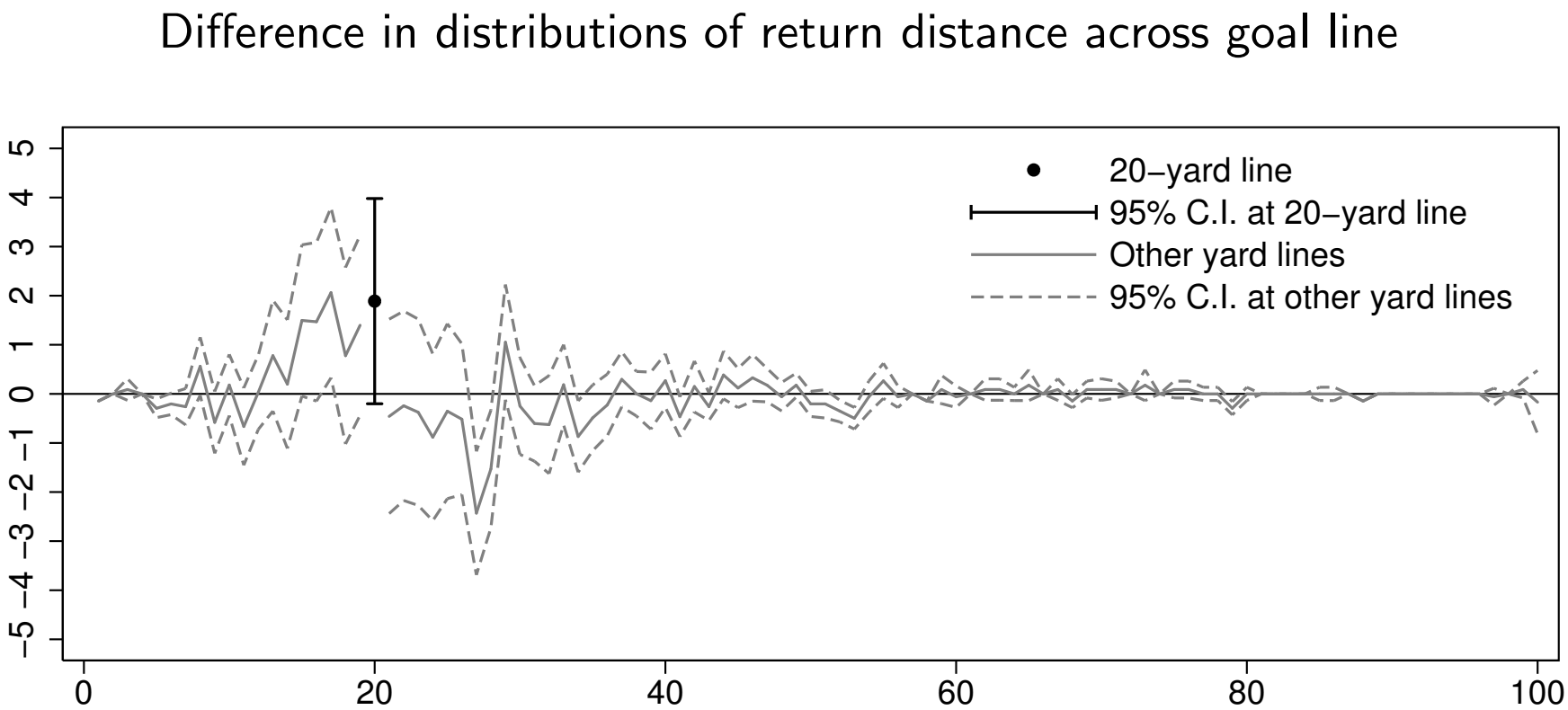
Returns from 1- & 2-yard lines (after)



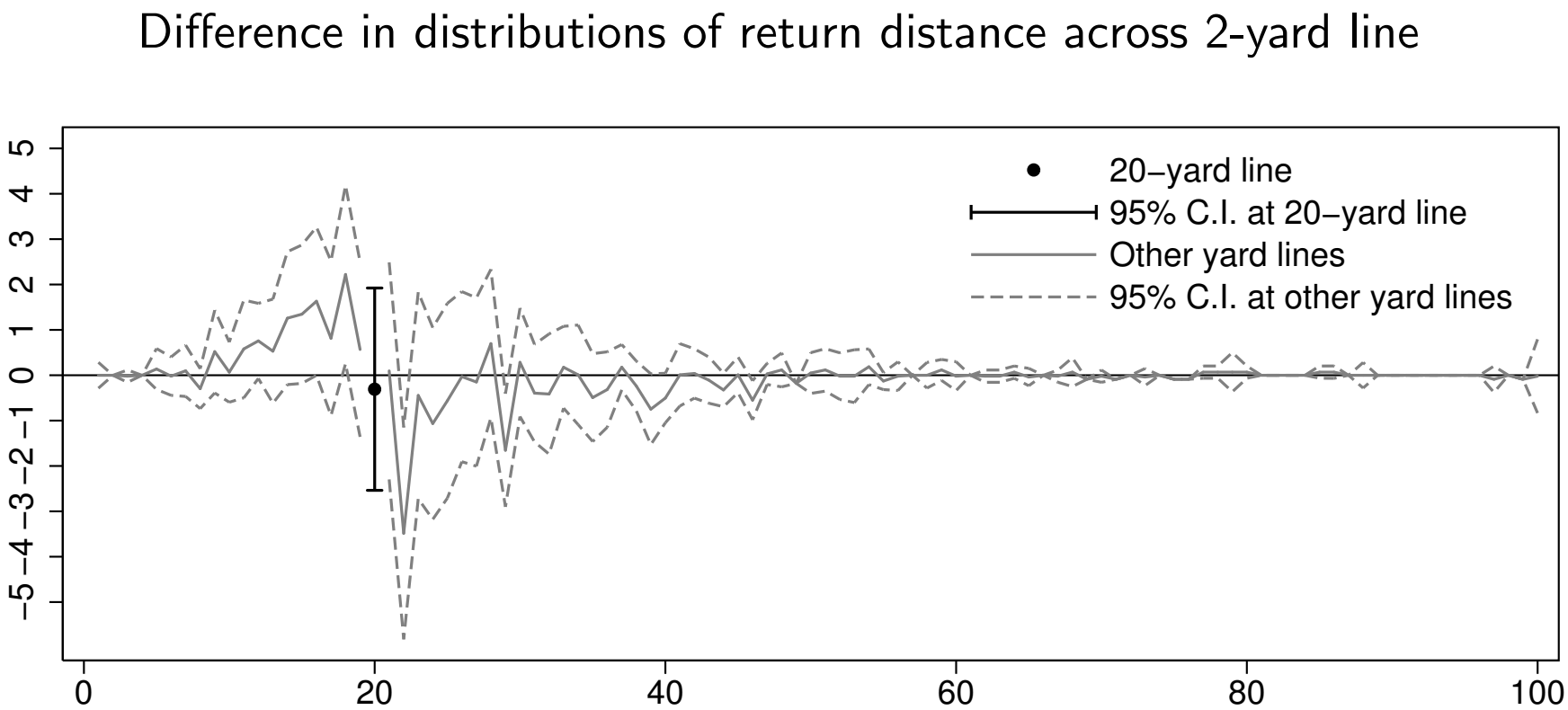
Returns from goal line & 1 yard deep in end zone (after)



Treatment effect (after)



Head-start effect (after)



Difference in difference (after)