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An Investigation into Why Horse Racing Experts Chose Not to Enter Their Horses in Other Similar-Distance Races

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presenter information

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our research interest

- communications in SNS
- user behavior analysis
- trust and security in SNS

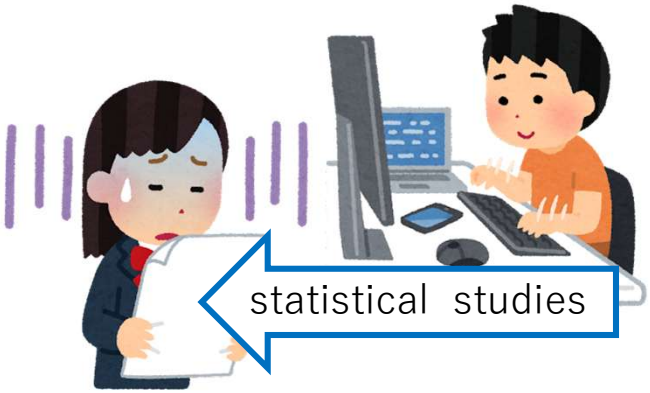
background

statistical studies showed that
even experts can make mistakes

We experts have

- knowledge,
- experience, and
- supporting staff

but, sometimes …



“fly-ball revolution” [Sawchik 2017]

fly-balls

◎ fly-balls
△ grounders
(from 2017)

statistical research

grounders

△ fly-balls
◎ grounders
(until 2017)

baseball experts

Which is better:
fly-balls, or grounders?

What we learned

statistical analysis can show
how experts made decisions

A new question

why experts made decisions ?
especially, decisions to stop trying

why we discuss decisions to stop trying ?

>>>>

harder

The longest mile is the last mile home.

A new question

why experts chose to stop trying ?

Research target

horse racing experts
(horse owners and trainers)

horse racing experts' purposes

win races and get the prize money

prize money
in Japan Racing Association (JRA)

Horse owners get prize money
when their horses finish within fifth place.

horse racing experts' tactics (1/2)

race selection

- select races that are likely to have good outcomes
- not select races that are likely to have poor outcomes

horse racing experts' tactics (2/2)

horse selection

- consider carefully
  which horses seem likely to win
  even in unfavorable races.
- enter good performance horses into
  similar-distance races repeatedly

Our reseach purpose

why horse racing experts chose to stop entering their horses in other similar-distance races？

One more point

whether experts considered sire lines when doing it？

horse racing experts' belief in selecting races

Many horse racing experts often say

a sire line can indicate
the potential abilities of a horse
(e.g. which distance races the horse is good at)

sire line: paternal lineage or ancestry of a horse

Our approach

we focus on

- sire line,
- race distance, and
- order of finish

and discuss

- experts' race selections,
- race results, and
- experts' judgements on horse performance

by using statistical analysis

Our approach (more specifically)

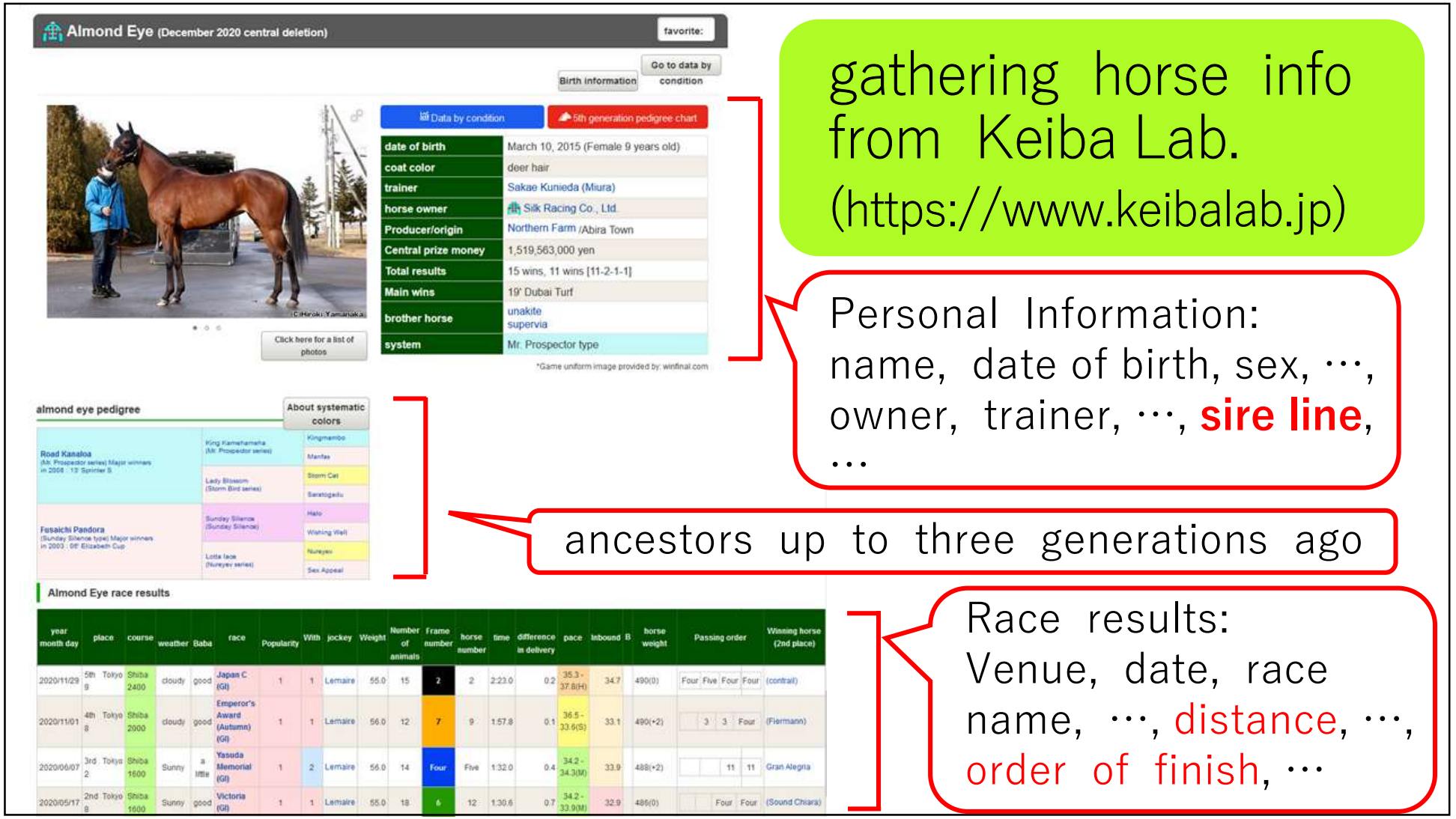
we examine

how many consecutive races
underperforming horses had finished
in low positions, including their last races

by using statistical analysis

one more point

whether experts consider sire lines
when choosing to stop entering
their horses in other similar-distance races


Almond Eye (December 2020 central deletion)
favorite:
Birth information
Go to data by condition
Data by condition
5th generation pedigree chart
date of birth
March 10, 2015 (Female 9 years old)
coat color
deer hair
trainer
Sakae Kunieda (Miura)
horse owner
Silk Racing Co., Ltd.
Producer/origin
Northern Farm /Abira Town
Central prize money
1,519,563,000 yen
Total results
15 wins, 11 wins [11-2-1-1]
Main wins
19' Dubai Turf
brother horse
unakite
supervia
system
Mr. Prospector type
Click here for a list of photos
almond eye pedigree
About systematic colors
Almond Eye race results
gathering horse info from Keiba Lab. (https://www.keibalab.jp)
Personal Information: name, date of birth, sex, …, owner, trainer, …, sire line, …
ancestors up to three generations ago
Race results: Venue, date, race name, …, distance, …, order of finish, …

our obtained data of racehorses

36922 horses registered with JRA from 2010 to 2017

Year	# of horses
2010	4470
2011	4524
2012	4505
2013	4595
2014	4672
2015	4663
2016	4738
2017	4755
Total	36922

of horses classified into three famous sire lines

sire line	# of horses
Native Dancer Line	8799
Nearctic Line	6383
Royal Charger Line	18104
others	3636
Total	36922

(Note) We grouped many kinds of branched sire lines into four kinds above

# of times the 36922 horses had competed in

race distance	# of races
1000 -- 1399m	98122
1400 -- 1799m	133635
1800 -- 2199m	131178
2200 -- 2799m	22009
2800m --	10882
Total	395826

# of times the 36922 horses of four sire lines had competed in races of various distances

	race distance					
sire line	1000 -- 1399m	1400 -- 1799m	1800 -- 2199m	2200 -- 2799m	2800m --	Total
Native Dancer	27008	31619	28568	4173	2511	93879
Nearctic	18710	22444	20072	2838	1647	65711
Royal Charger	42525	67514	71758	13181	5848	200826
others	9879	12058	10780	1817	876	35410
Total	98122	133635	131178	22009	10882	395826

# of times the 36922 horses of four sire lines had finished within fifth place in races of various distances

	race distance					
sire line	1000 -- 1399m	1400 -- 1799m	1800 -- 2199m	2200 -- 2799m	2800m --	Total
Native Dancer	9345	10912	10552	1748	1120	33677
Nearctic	6462	7700	7112	1070	728	23072
Royal Charger	13893	23937	26949	5369	2713	72861
others	3203	4054	3564	655	317	11793
Total	32903	46603	48177	8842	4878	141403

(Note) horses within fifth place get prize money in the JRA races

statistical analysis of
why experts chose to stop entering
their horses in other similar-distance races

we focus on

sire line, race distance, and order of finish

and discuss

- experts' race selections
- race results
- experts' judgements of horse performance

by using two-sided binomial tests

two hypotheses for statistical analysis

two-sided binomial test

- **Hypothesis *ES*** → experts' race selections
- **Hypothesis *EJ*** → experts' judgements of horse performance

two-sided binomial test on experts' race selections by using Hypothesis *ES*

Hypothesis *ES*

$$\frac{\#\text{ of times horses were entered into races of distance } d_j}{\#\text{ of times horses were entered into races}} \times \#\text{ of times horses of sire line } S_i \text{ were entered into races of distance } d_j$$

probability: an expert enters his/her horse into a race of distance d_j

two-sided binomial test on experts' judgements of horse performance by using Hypothesis *EJ*

Hypothesis *EJ*

$$\frac{\#\text{ of times horses of sire line } S_i \text{ were entered in races of distance } d_j}{\#\text{ of times horses were entered into races of distance } d_j} \times \#\text{ of times horse } h_k \text{ of sire line } S_i \text{ was entered into races of distance } d_j$$

probability: an expert enters a horse of sire line S_i into a race of distance d_j

How to analyze experts' race selections

We calculate the p-value of

- experts' race selections

by applying **Hypothesis *ES*** of

two-sided binomial test

sire lines		race distances	
Native Dancer Line	X	1000 – 1399m	2200 – 2799m
		1400 – 1799m	2800m –
		1800 – 2199m	

The results of experts' race selections

Native Dancer Line

	race distance				
sire line	1000 -- 1399m	1400 -- 1799m	1800 -- 2199m	2200 -- 2799m	2800m --
Native Dancer	1.0000	0.3024	0.0000	0.0000	0.0825

experts' expectations

favorable to win

unfavorable to win

The significant level: 0.05

How to analyze experts' judgements of horse performance

two-sided binomial test

We calculate the p-value of

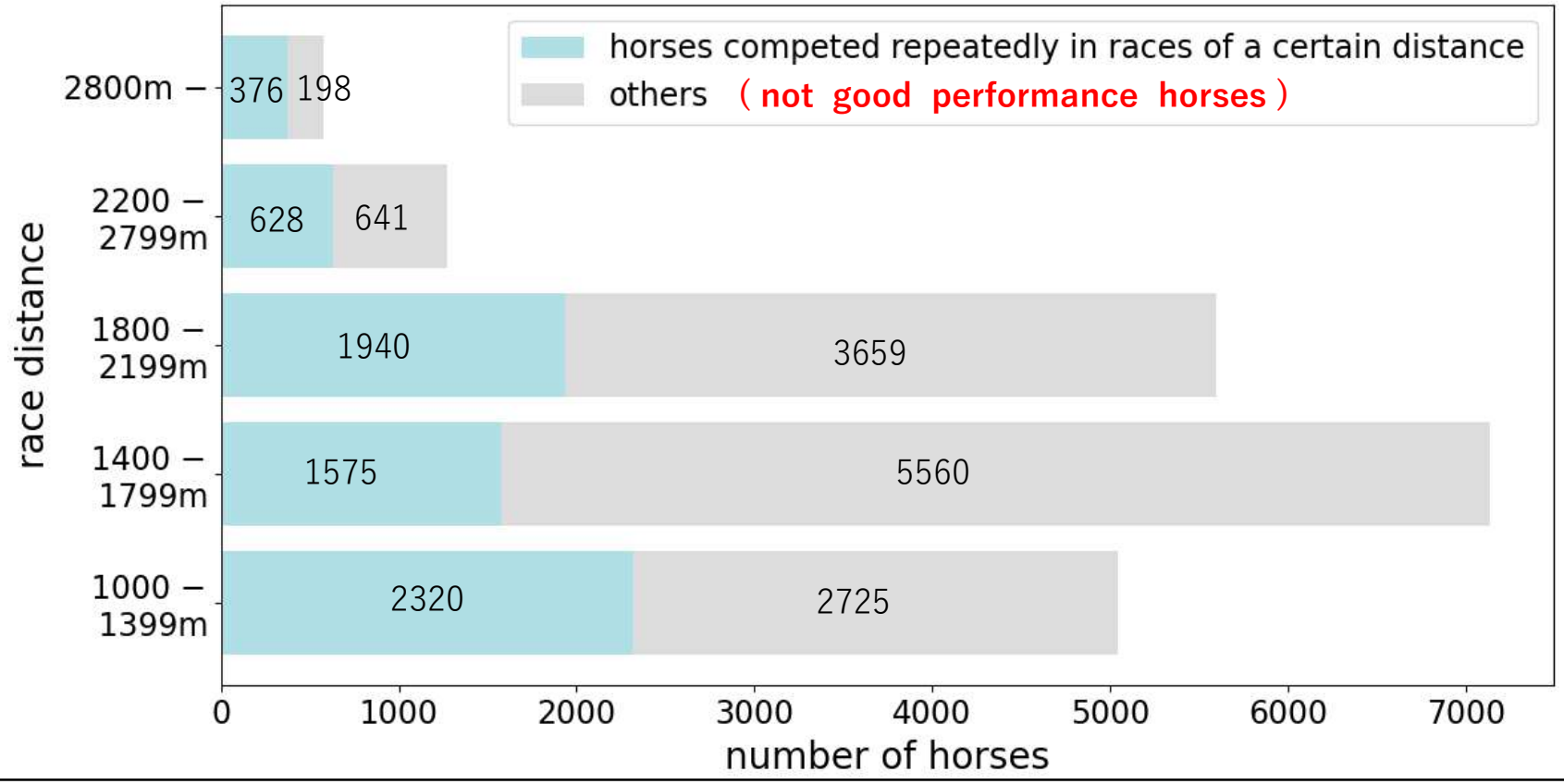
- experts' judgements of horse performance

by applying **Hypothesis *EJ*** and detect not good performance horses in races of a certain distance

sire lines		race distances	
Native Dancer Line	X	1000 – 1399m	2200 – 2799m
		1400 – 1799m	2800m –
		1800 – 2199m	

experts' judgements of horse performance (1/2)

Native Dancer Line



experts' judgements of horse performance (2/2)

Native Dancer Line

not good performance horses

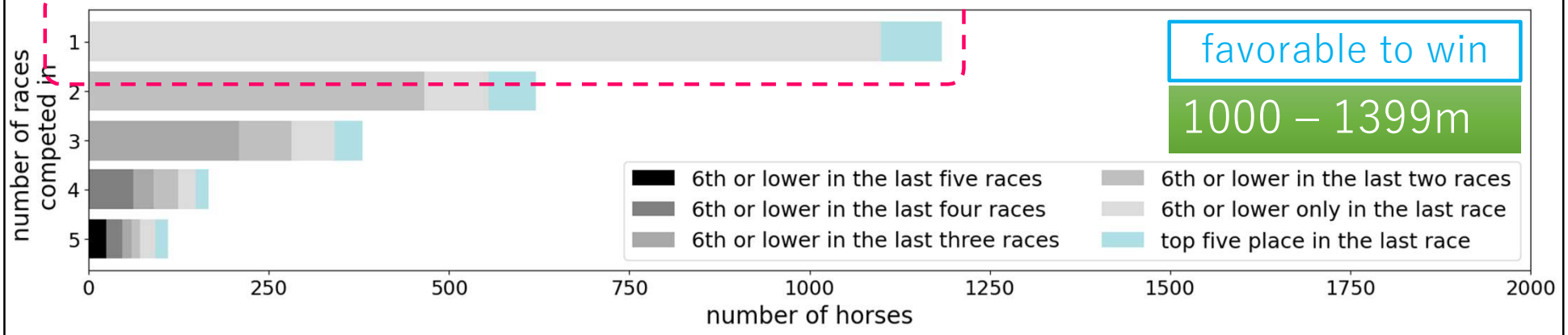
	race distance				
	1000 -- 1399m	1400 -- 1799m	1800 -- 2199m	2200 -- 2799m	2800m --
# of horses	2725	5560	3659	641	198
races competed in	7003	18128	10361	865	263
average of races competed in	2.6	3.3	2.8	1.3	1.3
SD of races competed in	2.3	3.0	2.7	0.7	0.6

SD: Standard Deviation
The significant level: 0.05

how many consecutive races
not good performance horses
had finished in low positions

Native Dancer Line

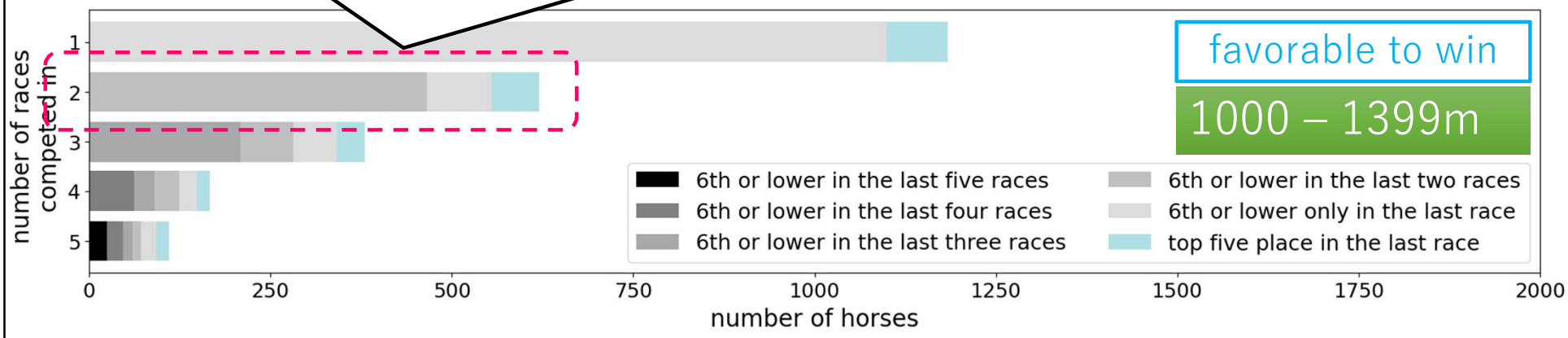
- and horses only ran in one race
- horses finished in 6th place or lower
- horses finished in top five place



how many consecutive races not good performance horses

Native Dancer Line

- , and horses ran in two races
- finished in 6th or lower in the last two races
- finished in 6th or lower in the last race
- finished in top five place in the last race

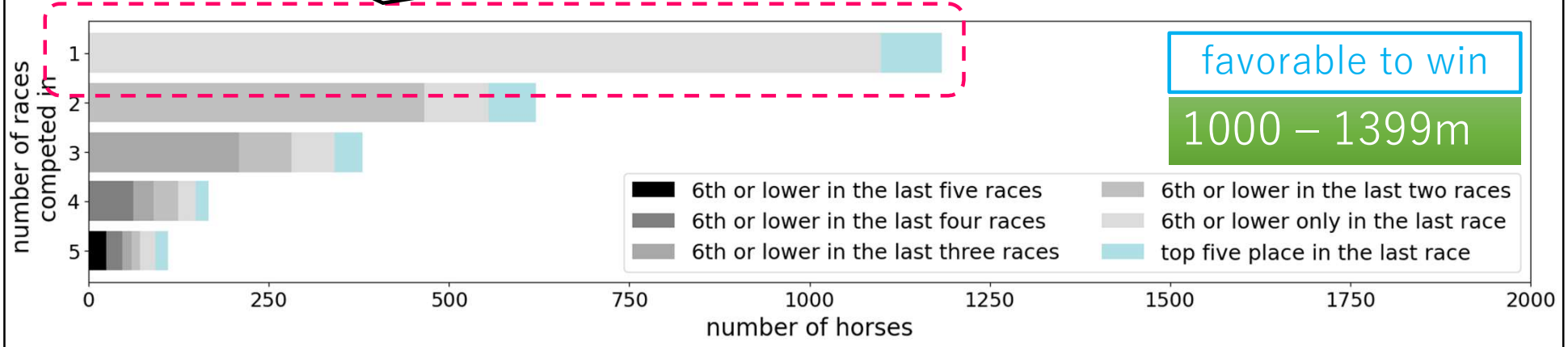


the most common case
where experts chose to stop entering
horses in other similar-distance races

Native Dancer Line

the most common case

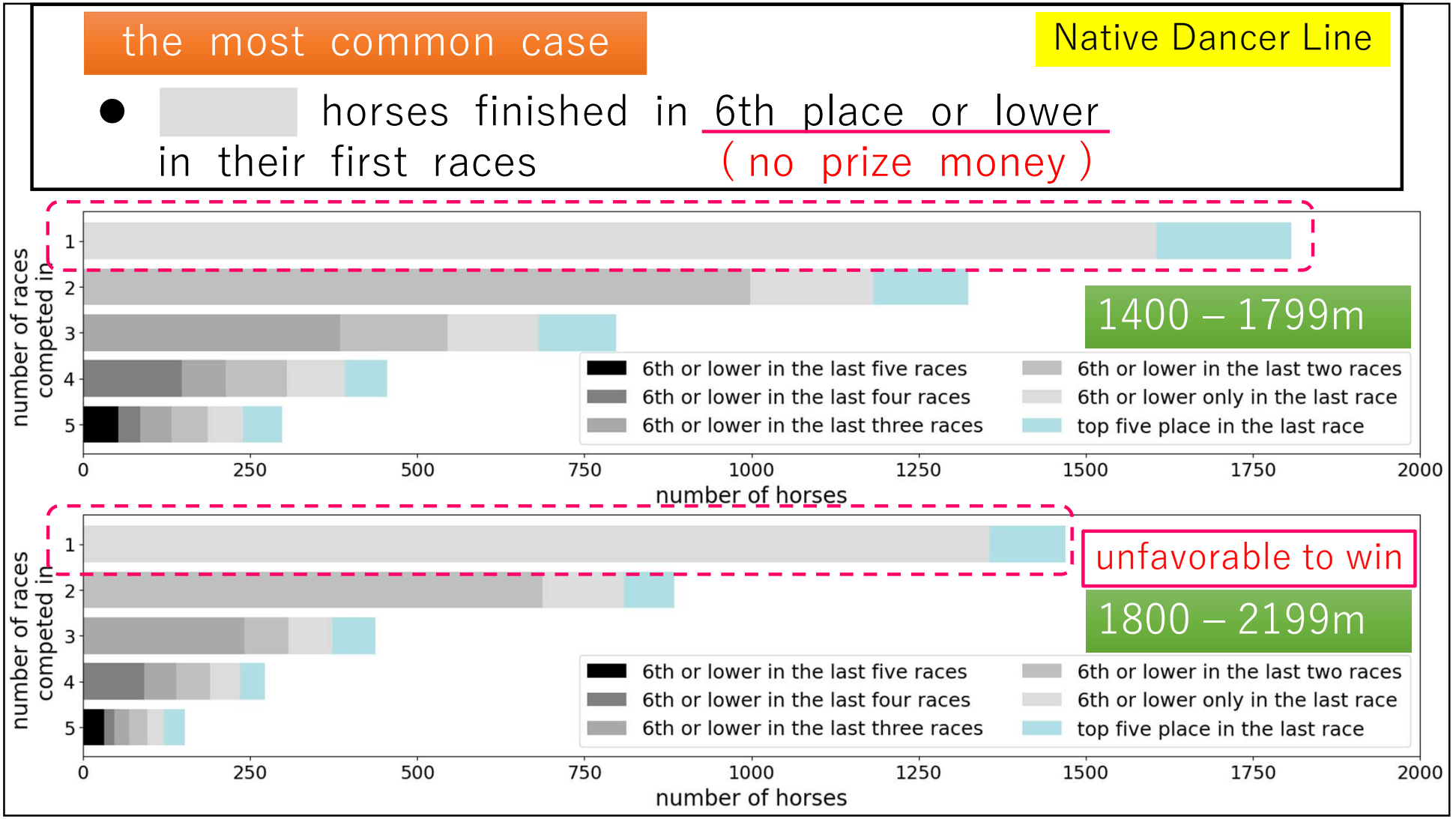
- [redacted] horses finished in 6th place or lower in their first races
  (no prize money)



the most common case

Native Dancer Line

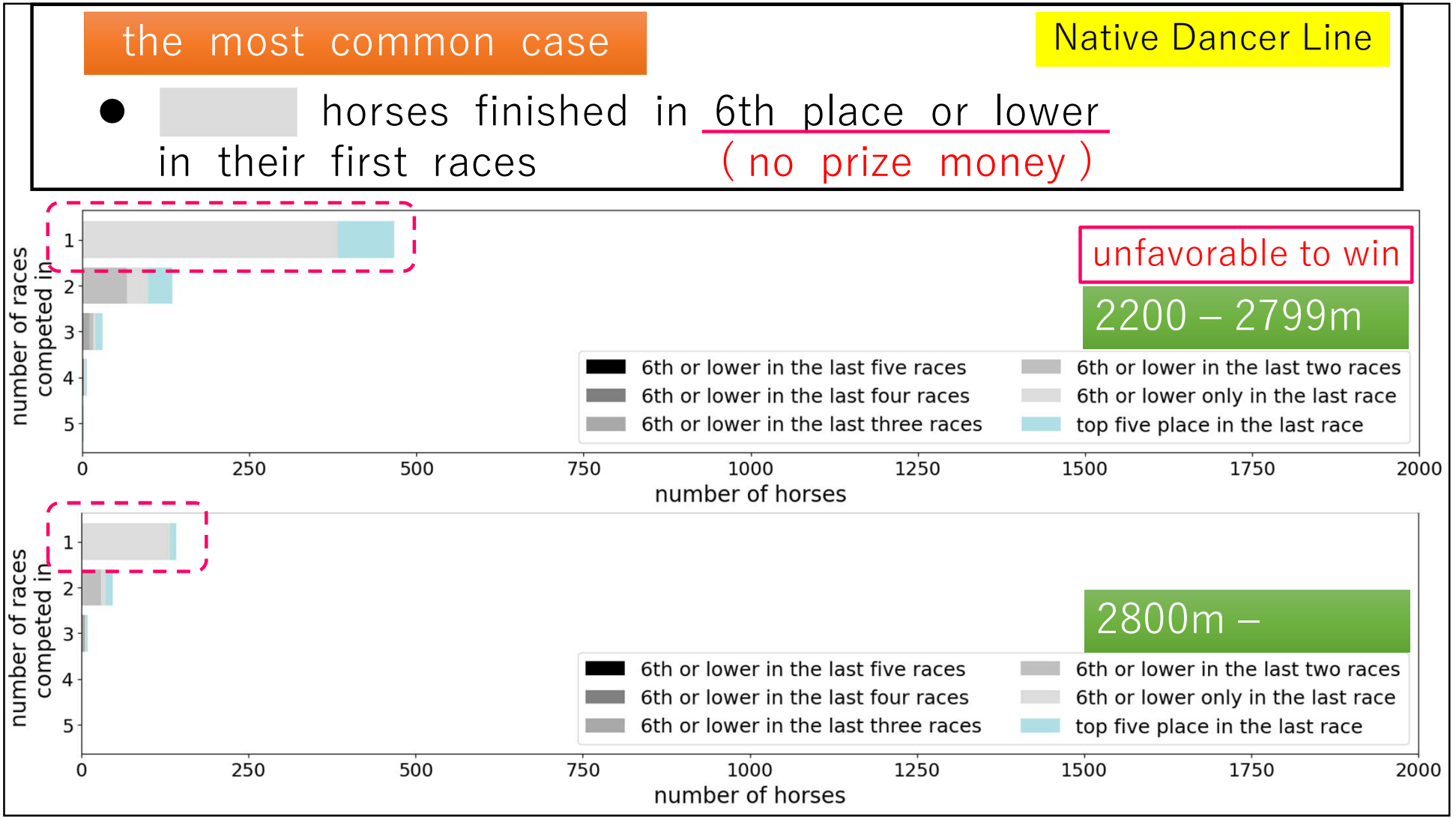
● horses finished in 6th place or lower in their first races (no prize money)



the most common case

Native Dancer Line

● [redacted] horses finished in 6th place or lower (no prize money) in their first races

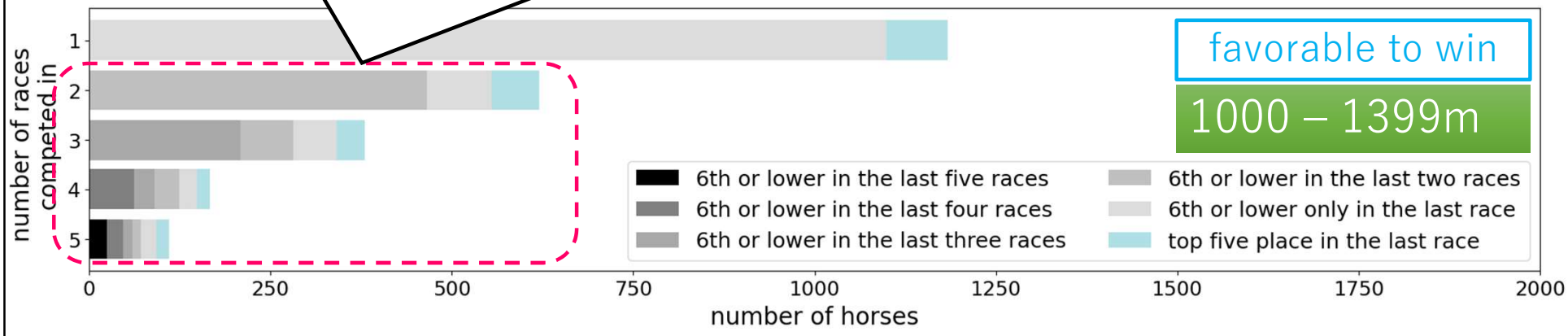


the second common case
where experts chose to stop entering horses in other similar-distance races

Native Dancer Line

the second common case

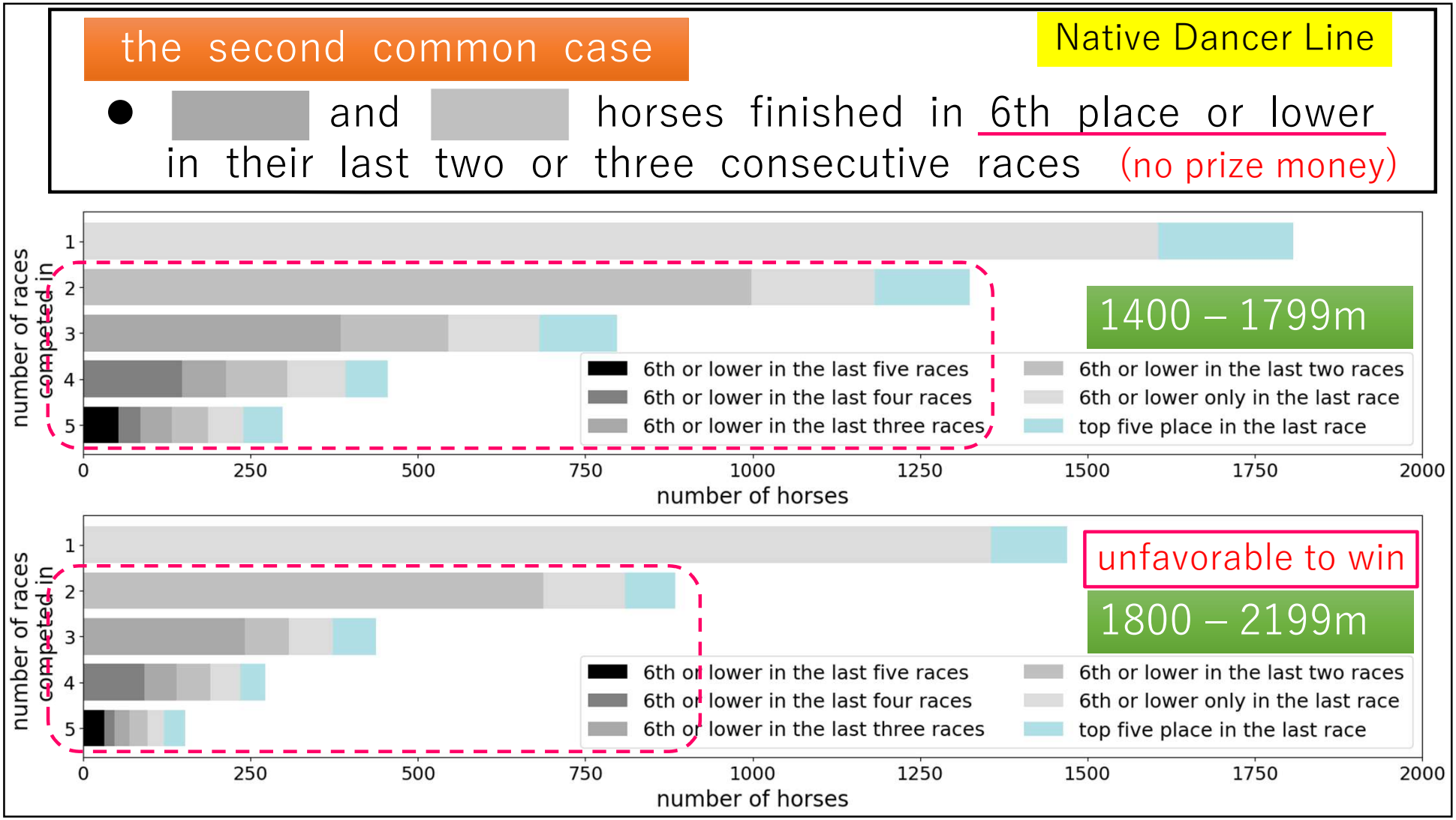
- ■ and ■ horses finished in 6th place or lower in their last two or three consecutive races (no prize money)



the second common case

Native Dancer Line

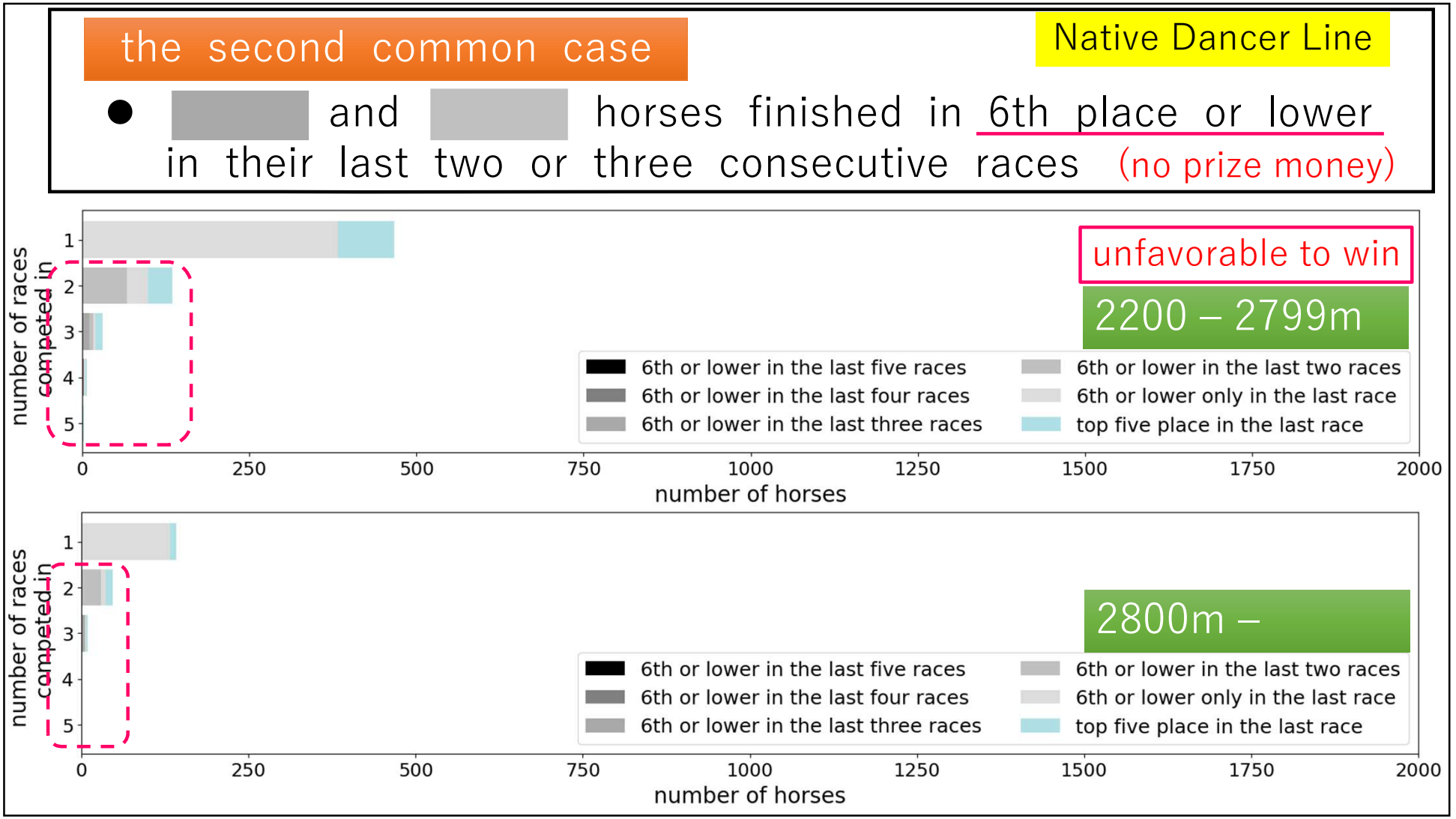
- [redacted] and [redacted] horses finished in 6th place or lower in their last two or three consecutive races (no prize money)



the second common case

Native Dancer Line

- ■ and ■ horses finished in 6th place or lower in their last two or three consecutive races (no prize money)



Conclusion

the reasons why experts chose to stop entering their horses in other similar-distance races

Native Dancer Line

race distances	1000 – 1399m	1400 – 1799m	1800 – 2199m	2200 – 2799m	2800m –

in all race distance,

their horses finished in 6th place or lower
(no prize money)

- in their first race
- in their last two or three consecutive races

One more point
experts considered sire lines ?

Native Dancer Line

race distances	1000 – 1399m	1400 – 1799m	1800 – 2199m	2200 – 2799m	2800m –
experts' expectations	favorable to win		unfavorable to win		

- race selection ➡ experts considered it strongly

however . . .

One more point
experts considered sire lines ?

Native Dancer Line

race distances	1000 – 1399m	1400 – 1799m	1800 – 2199m	2200 – 2799m	2800m –
experts' expectations	favorable to win		unfavorable to win		

in all race distances,

their horses finished in 6th place or lower

- in their first race
- in their last two or three consecutive races

even if the race distance was different, the reasons were not different

NO! experts did not consider sire lines

One more point
experts considered sire lines ?

Native Dancer Line

race distances	1000 – 1399m	1400 – 1799m	1800 – 2199m	2200 – 2799m	2800m –
experts' expectations	favorable to win		unfavorable to win		

- race selection — strongly
- stop entering horses in other races — no

Future works

To generalize this finding, we intend to

- analyze race performance data in other countries
- compare the results with those obtained in this study

2026

The Year of the Horse