

The Batting Pitcher:

A Statistical Analysis based on NL vs. AL
Pitchers' batting statistics in the World Series
and the implications on their team's success
in the series

NL vs. AL Rules

- National League teams have pitchers hit
- American League teams utilize a designated hitter
- The game is played by the home team's league rules

NL vs. AL Rules

- Interleague Play
- World Series

Research

- Databases
- Box Scores
- Play by Plays

Last 20 Years

NL AB	AL AB	NL BB	AL BB	NL Hits	AL Hits	NL Total Bases	AL Total Bases	NL RBIs	AL RBIs	NL Runs	AL Runs	NL Strikeouts	AL Strikeouts	Winner NL	Winner AL
6	7	0	0	1	0	1	0	0	0	0	0	2	3	1	0
6	7	0	0	0	0	0	0	0	0	0	0	4	3	0	1
5	3	0	0	1	0	1	0	1	0	0	0	3	1	1	0
7	8	1	0	0	0	1	1	0	0	0	1	3	2	1	0
6	3	0	0	1	1	1	2	0	0	0	0	1	0	1	0
6	4	0	0	2	0	2	0	0	0	0	0	3	3	0	1
8	5	0	0	1	1	2	1	1	0	1	0	3	2	1	0
3	5	0	0	1	1	1	1	0	2	0	0	1	2	0	1
8	4	0	0	0	0	0	0	0	0	0	0	1	2	1	0
3	5	0	0	0	0	0	0	0	0	0	0	1	2	0	1
2	4	0	1	1	0	2	1	0	0	1	0	0	3	0	1
9	5	0	0	1	1	1	1	2	0	0	0	4	3	1	0
3	6	0	0	1	1	1	1	1	0	1	0	1	2	0	1
13	7	0	0	1	1	2	1	1	0	2	0	7	4	1	0
5	8	0	0	1	0	1	0	0	0	0	0	1	4	0	1
2	6	1	0	0	0	1	0	0	0	0	0	2	0	0	1
4	6	0	0	2	1	2	1	0	0	1	0	0	2	0	1
7	10	0	0	0	2	1	3	0	2	1	1	2	5	1	0
4	9	1	0	1	1	2	1	0	0	1	0	1	2	0	1
7	6	1	0	0	0	1	0	0	0	0	0	3	1	1	0
114	118	4	1	15	10	23	14	6	4	8	2	43	46	0.5	0.5

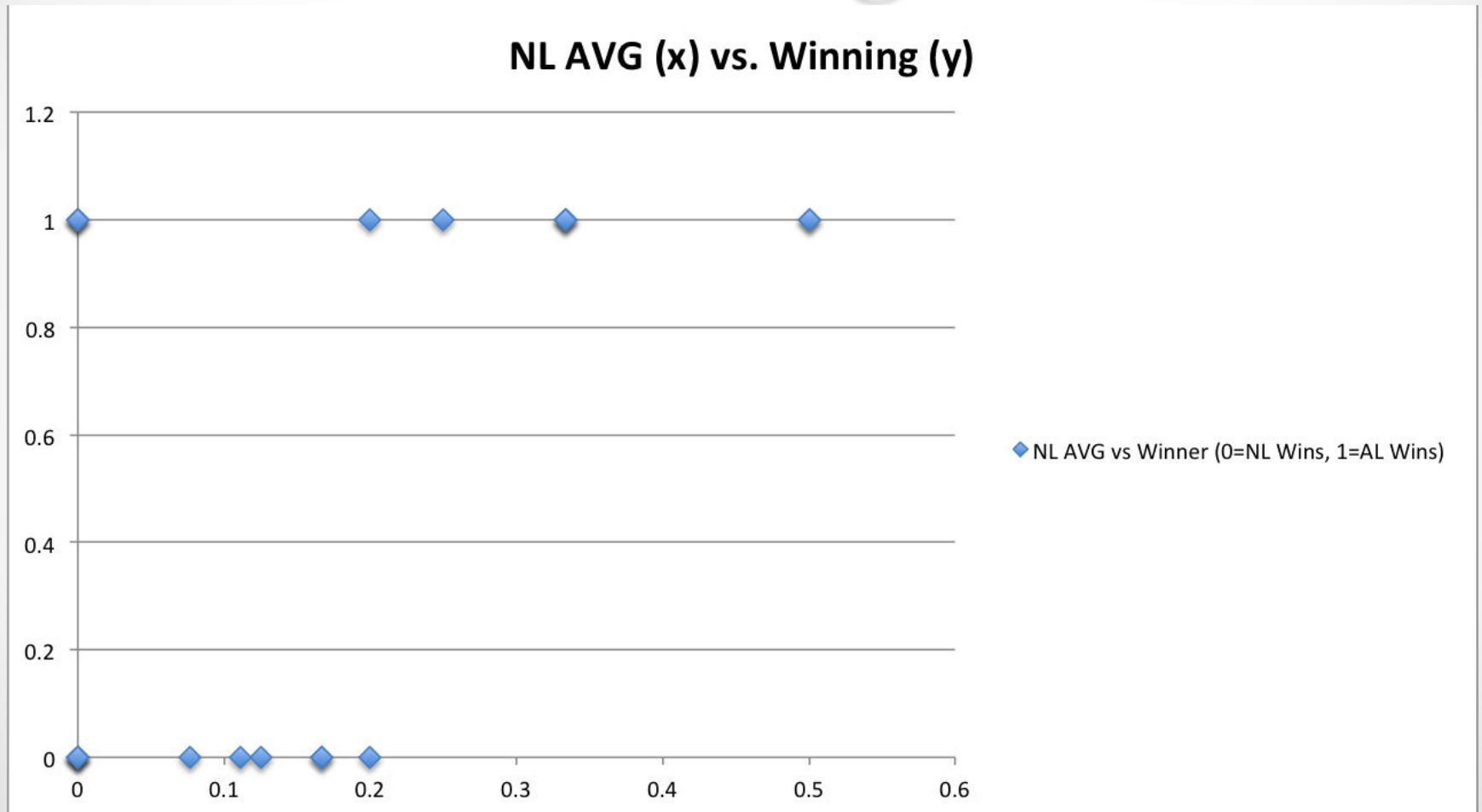
Total

	NL Average	AL Average	NL Slugging	AL Slugging	NL OBP	AL OBP
2014	0.166667	0	0.166667	0	0.166667	0
2013	0	0	0	0	0	0
2012	0.2	0	0.2	0	0.2	0
2011	0	0	0.142857	0.125	0.125	0
2010	0.166667	0.333333	0.166667	0.666667	0.166667	0.333333
2009	0.333333	0	0.333333	0	0.333333	0
2008	0.125	0.2	0.25	0.2	0.125	0.2
2007	0.333333	0.2	0.333333	0.2	0.333333	0.2
2006	0	0	0	0	0	0
2005	0	0	0	0	0	0
2004	0.5	0	1	0.25	0.5	0.2
2003	0.111111	0.2	0.111111	0.2	0.111111	0.2
2002	0.333333	0.166667	0.333333	0.166667	0.333333	0.166667
2001	0.076923	0.142857	0.153846	0.142857	0.076923	0.142857
2000	0.2	0	0.2	0	0.2	0
1999	0	0	0.5	0	0.333333	0
1998	0.5	0.166667	0.5	0.166667	0.5	0.166667
1997	0	0.2	0.142857	0.3	0	0.2
1996	0.25	0.111111	0.5	0.111111	0.4	0.111111
1995	0	0	0.142857	0	0.125	0
TOTALS	0.131579	0.084746	0.201754	0.118644	0.161017	0.092437

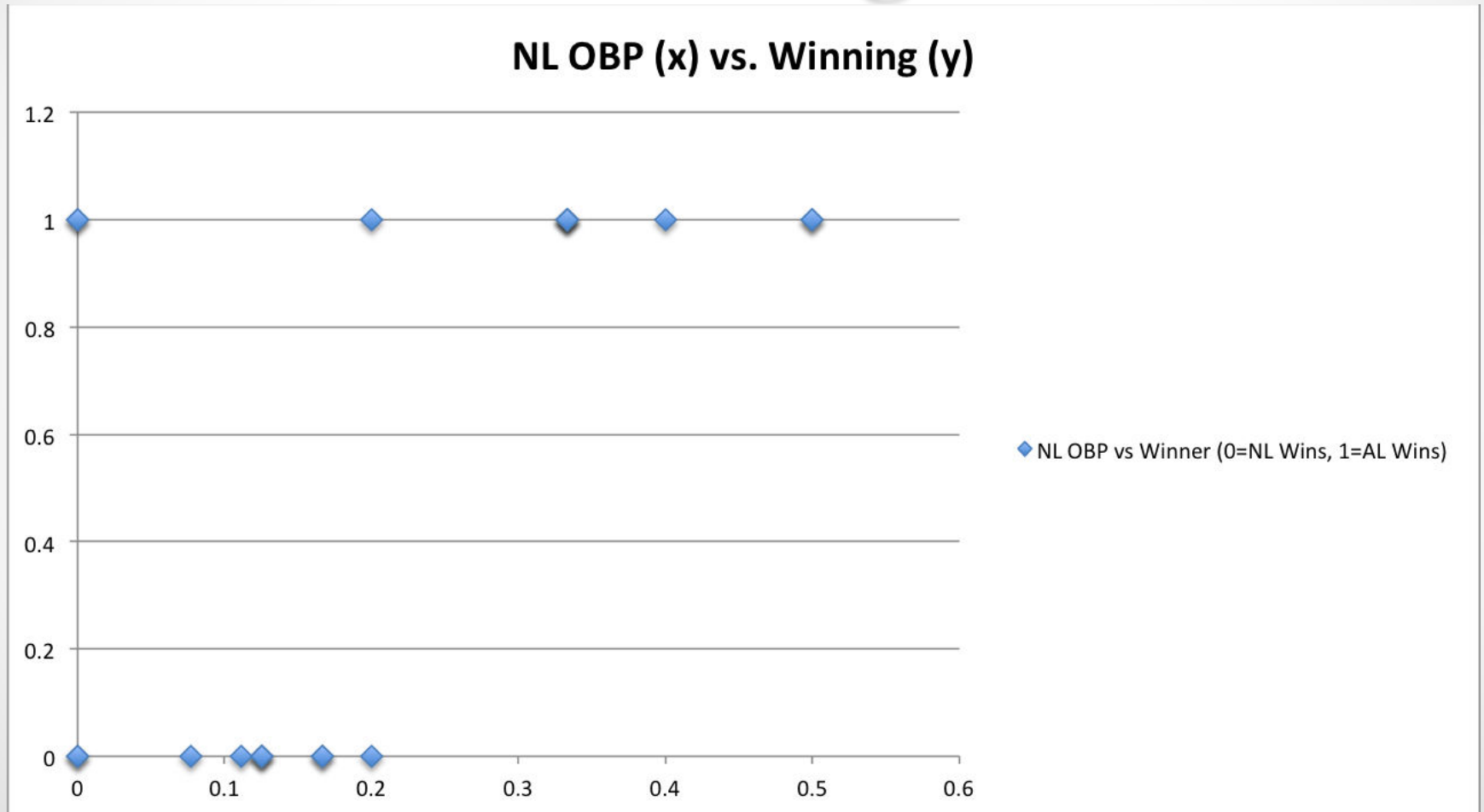
Correlation

CORRELATION WITH WINS						
	NL Average	AL Average	NL Slugging	AL Slugging	NL OBP	AL OBP
	-0.496324	-0.209976	-0.487776	-0.233778	-0.584883	-0.111763

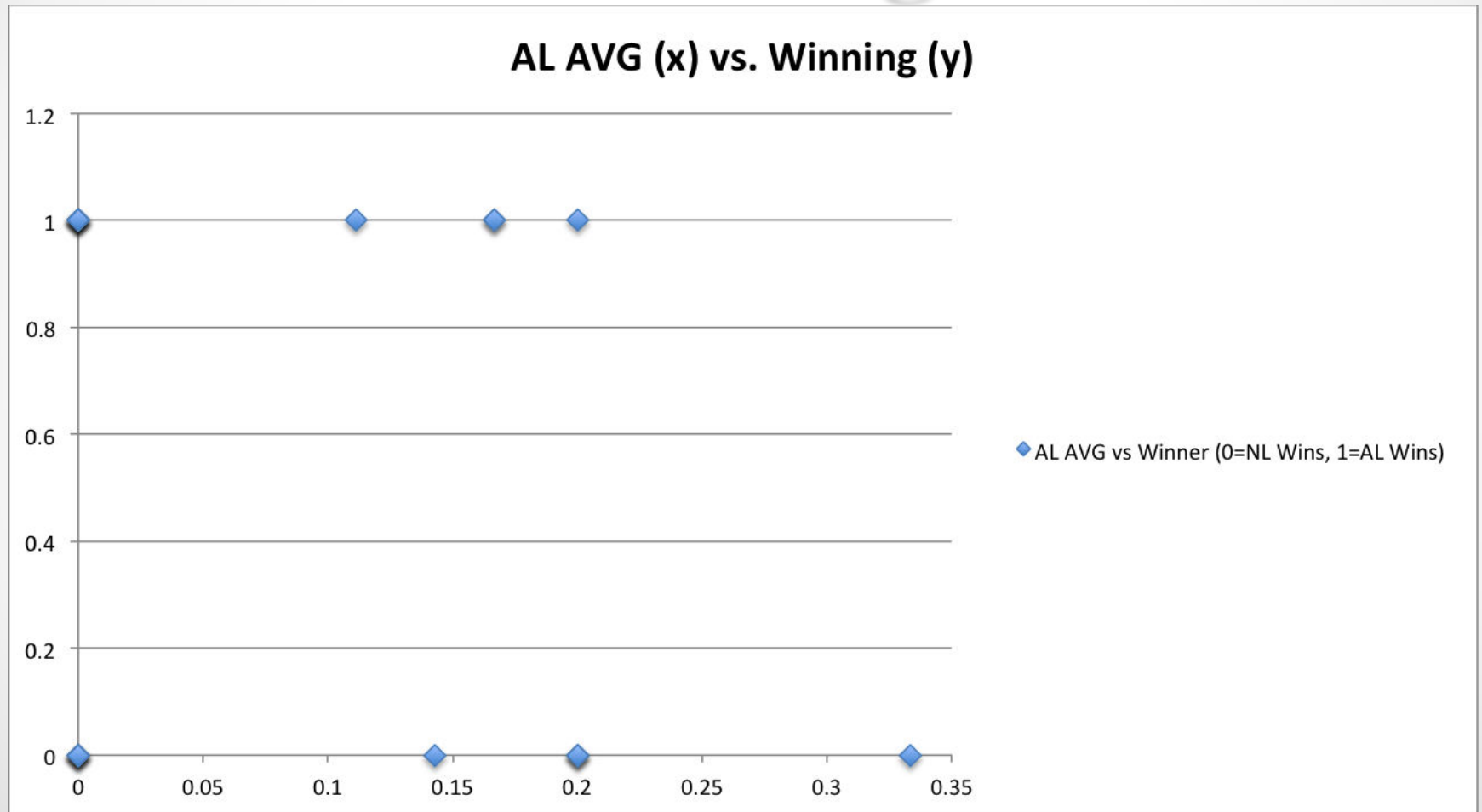
National League AVG



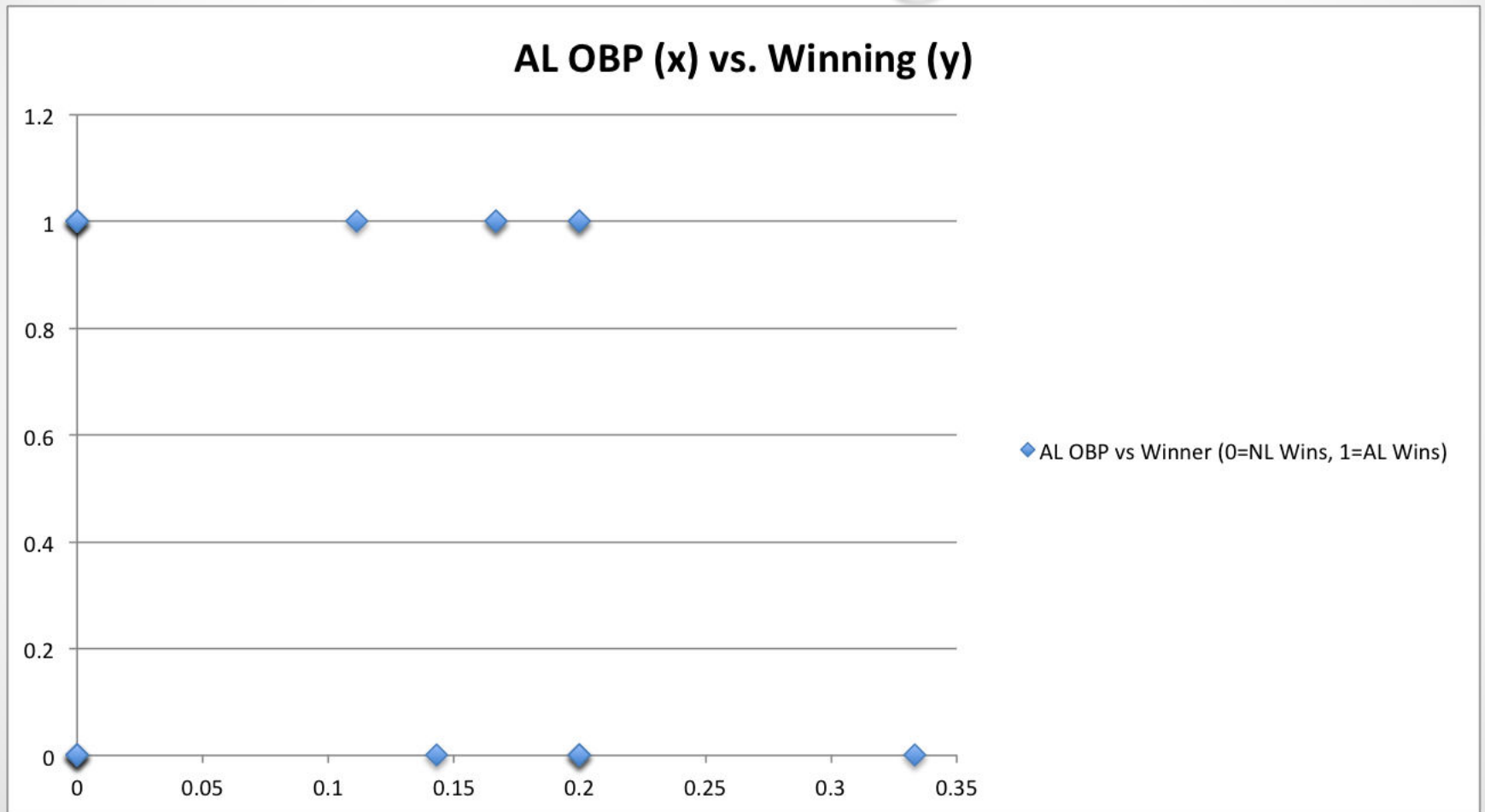
National League OBP



American League AVG



American League OBP



Bill James Estimator

$$p \sim \frac{PS^\alpha}{PS^\alpha + PA^\alpha}$$

Bill James Estimator

- Baseball constant is = 2

- National League:

- $0.941 = 8^2 / (8^2 + 2^2)$

- American League:

- $0.059 = 2^2 / (2^2 + 8^2)$

Game Theory

- Impossible to assign exact numbers of gained or lost utility, but easy to model it
- Normal decision general managers and coaches in Major League Baseball balance every year

Game Theory

	AL batting practice	AL no batting practice
NL Batting Practice	Batting: AL = NL Pitching: AL-, NL-	Batting: NL+, AL- Pitching: AL+, NL-
NL No Batting practice	Batting: AL+, NL- Pitching: AL-, NL+	Batting: NL = AL Pitching: AL+, NL+

Strategy?

- Average Plate Appearances for NL starting pitcher: 62
- Average Plate Appearances for AL starting pitcher: 7

Strategy?

- Does it make sense for AL pitchers to practice batting? Probably not.
- Does it make sense for NL pitchers to practice batting? Probably.
- MLB now?

NERV

NERV:



		MEN ON BASE							
		0	1	2	3	1,2	1,3	2,3	1,2,3
OUTS	0	0.537	0.907	1.138	1.349	1.515	1.762	1.957	2.399
	1	0.294	0.544	0.720	0.920	0.968	1.140	1.353	1.617
	2	0.114	0.239	0.347	0.391	0.486	0.522	0.630	0.830

The matrix shows the expected number of runs scored, on average, in each of 24 possible game situations. A batter comes up with 0, 1, or 2 outs (rows) and one of eight possible scenarios of men on base (columns). Men on first and third, for example, appears in the table as "1,3."

NERV

ENDING SITUATION – STARTING SITUATION = NERV

wWPA

(WINNING TEAM WIN PROBABILITY ADDITION)

1998 World Series

- Yankees (AL) vs. Padres (NL)
- Yankees lead 3-0
- Game 4
- Kevin Brown vs. Andy Pettitte

Kevin Brown AB #1

Bottom of the 2nd, Padres Batting, Tied 0-0, Yankees' Andy Pettitte facing 4-5-6

b2	0-0	0	---	2,(0-1)	O	SDP	K. Caminiti	A. Pettitte	2%	47%	Groundout: 3B-1B (Weak 3B)
b2	0-0	1	---	6,(3-2)		SDP	J. Leyritz	A. Pettitte	-3%	45%	Walk
b2	0-0	1	1--	1,(0-0)		SDP	R. Rivera	A. Pettitte	-4%	41%	Single to SS (Ground Ball to Weak SS); Leyritz to 2B
b2	0-0	1	12-	5,(2-2)	O	SDP	C. Hernandez	A. Pettitte	5%	46%	Strikeout Swinging
b2	0-0	2	12-	4,(3-0)		SDP	C. Gomez	A. Pettitte	-3%	42%	Walk; Leyritz to 3B; Rivera to 2B
b2	0-0	2	123	2,(0-1)	O	SDP	K. Brown	A. Pettitte	8%	50%	Bunt Groundout: C-1B

0 runs, 1 hit, 0 errors, 3 LOB. Yankees 0, Padres 0.

Kevin Brown AB #1

- $wWPA = 8\%$
- $NERV = -.830$ runs

Andy Pettitte AB #1

Top of the 3rd, Yankees Batting, Tied 0-0, Padres' Kevin Brown facing 7-8-9											
t3	0-0	0	---	3,(0-2)	O	NY Yankees	R. Ledee	K. Brown	-2%	48%	Strikeout Looking
t3	0-0	1	---	6,(3-2)	O	NY Yankees	J. Girardi	K. Brown	-2%	46%	Flyball: RF (Short RF Line)
t3	0-0	2	---	3,(0-2)	O	NY Yankees	A. Pettitte	K. Brown	-1%	45%	Strikeout Swinging
0 runs, 0 hits, 0 errors, 0 LOB. Yankees 0, Padres 0.											

Andy Pettitte AB #1

- $wWPA = -1\%$
- $NERV = -0.114$

Kevin Brown AB #2

Bottom of the 5th, Padres Batting, Tied 0-0, Yankees' Andy Pettitte facing 7-8-9											
b5	0-0	0	---	7,(1-2)	O	SDP	C. Hernandez	A. Pettitte	3%	46%	Strikeout Swinging
b5	0-0	1	---	5,(2-2)	O	SDP	C. Gomez	A. Pettitte	2%	49%	Groundout: P-1B
b5	0-0	2	---	1,(0-0)		SDP	K. Brown	A. Pettitte	-2%	47%	Single to CF (Line Drive)
b5	0-0	2	1--	2,(1-0)	O	SDP	Q. Veras	A. Pettitte	3%	50%	Groundout: P-1B
									0 runs, 1 hit, 0 errors, 1 LOB. Yankees 0, Padres 0.		

Kevin Brown AB #2

- $wWPA = -2\%$
- $NERV = 0.239 - 0.114 = +0.125$

Andy Pettitte AB #2

Top of the 5th, Yankees Batting, Tied 0-0, Padres' Kevin Brown facing 5-6-7										
t5	0-0	0	---	4,(1-2)		NY Yankees	T. Martinez	K. Brown	5%	55% Single to SS (Ground Ball to SS-3B Hole)
t5	0-0	0	1--	4,(1-2)	O	NY Yankees	S. Brosius	K. Brown	-4%	50% Strikeout Looking
t5	0-0	1	1--	3,(1-1)		NY Yankees	R. Ledee	K. Brown	12%	62% Double to 1B (Line Drive to Deep 1B); Martinez to 3B
t5	0-0	1	-23	1,(0-0)	O	NY Yankees	J. Girardi	K. Brown	-11%	51% Groundout: P-1B
t5	0-0	2	-23	6,(3-2)	O	NY Yankees	A. Pettitte	K. Brown	-8%	44% Strikeout Swinging
									0 runs, 2 hits, 0 errors, 2 LOB. Yankees 0, Padres 0.	

Andy Pettitte AB #2

- $wWPA = -8\%$
- $NERV = -0.630$

Andy Pettitte PA #3

Top of the 5th, Yankees Batting, Tied 0-0, Padres' Kevin Brown facing 5-6-7										
t5	0-0	0	---	4,(1-2)		NY Yankees	T. Martinez	K. Brown	5%	55% Single to SS (Ground Ball to SS-3B Hole)
t5	0-0	0	1--	4,(1-2)	O	NY Yankees	S. Brosius	K. Brown	-4%	50% Strikeout Looking
t5	0-0	1	1--	3,(1-1)		NY Yankees	R. Ledee	K. Brown	12%	62% Double to 1B (Line Drive to Deep 1B); Martinez to 3B
t5	0-0	1	-23	1,(0-0)	O	NY Yankees	J. Girardi	K. Brown	-11%	51% Groundout: P-1B
t5	0-0	2	-23	6,(3-2)	O	NY Yankees	A. Pettitte	K. Brown	-8%	44% Strikeout Swinging
									0 runs, 2 hits, 0 errors, 2 LOB. Yankees 0, Padres 0.	

Andy Pettitte PA #3

- $wWPA = -2\%$
- $NERV = 0.347 - 0.544 = -0.197$

Total NERV, wWPA Game 4

- Kevin Brown total:
 - wWPA = 6% during his 2 at bats
 - NERV = -0.705
 -
- Andy Pettitte total:
 - wWPA = -11% during his 3 plate appearances
 - NERV = -0.941

Conclusions

- Little evidence to suggest a strong influence in World Series outcomes

Possible Explanations

- Not enough ABs for pitchers in World Series

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- American League DH advantage

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- Not enough ABs for pitchers in World Series
- American League DH advantage
- Limited Sample Size

END