NBA Comeback Clutchness

Sandy Huang

Toa Lohe

OUTLINE

- Introduction
- Previous Work
- Methodology
- Comeback Clutchness MVPs
- Value of Comeback Clutchness
- Comeback Clutchness vs. Escape Clutchness
- Clutch vs. Regular Performance
- Repeatable Skill or Noise?
- Conclusion

INTRODUCTION

DEFINITION OF COMEBACK CLUTCHNESS

1) Last 5 minutes of the 4^{th} quarter or overtime
2) Player's team is behind by at most 5 points or tied but not ahead

DEFINITION OF COMEBACK CLUTCHNESS

1) Last 5 minutes of the 4th quarter or overtime
2) Player's team is behind by at most 5 points or tied but not ahead

In contrast, escape clutchness is defined as:

1) Last 5 minutes of the 4th quarter or overtime
2) Player's team is ahead by at most 5 points or tied but not behind

The inclusion of ties in both is because the NBA does not exclusively track non-ties (i.e. they do not track ahead only or behind only)

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PREVIOUS WORK

- http://www.82games.com/clutchplayers.htm
- http://www.82games.com/clutchplay2.htm
- http://www.82games.com/clutchplay3.htm
- http://www.libertyballers.com/2012/2/29/2832299/lebron-james-kobe-bryant-dwyane-wade-clutch-nba-playoffs-4th-quarter
- No previous study has specifically studied comeback clutchness

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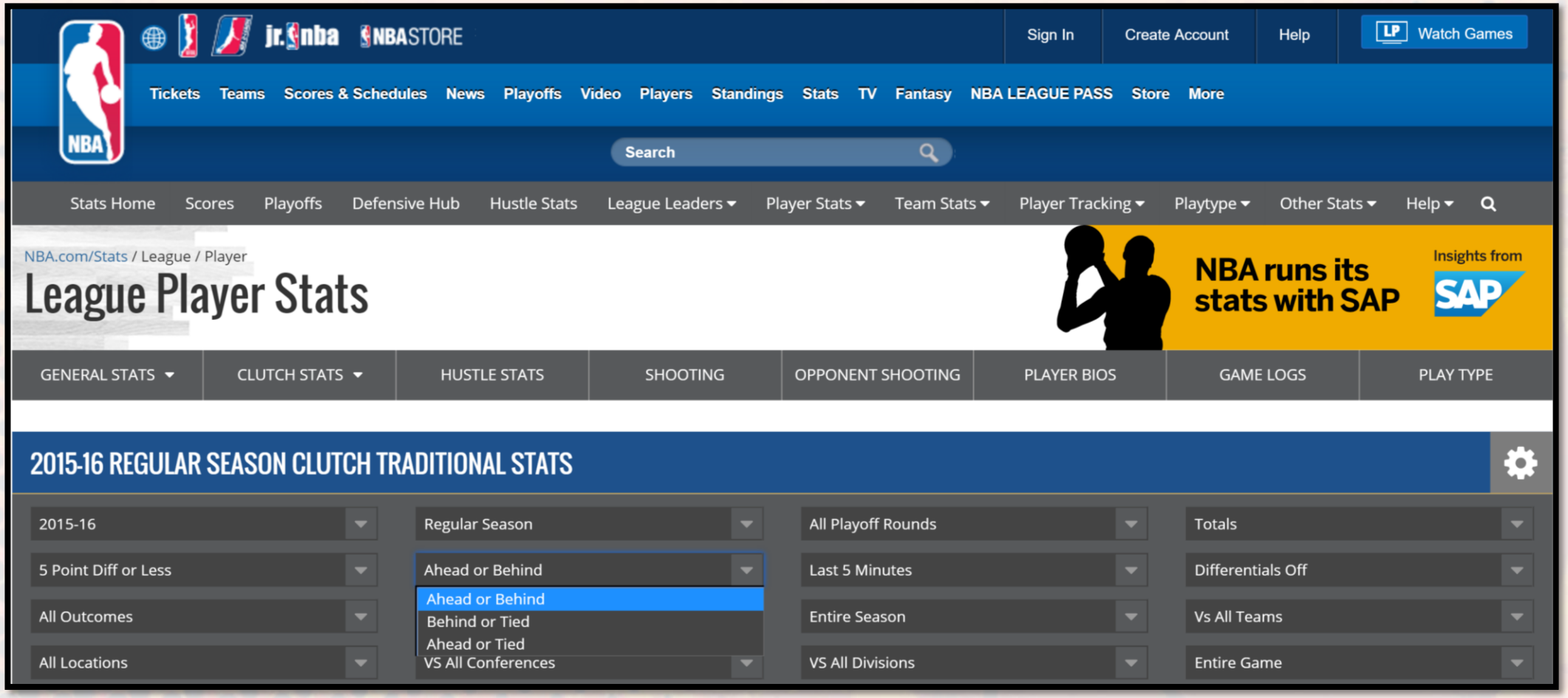
METHODOLOGY



METHODOLOGY

2015-16 REGULAR SEASON CLUTCH ADVANCED STATS

Net Rating - Net Rating is the difference in a player or team's Offensive and Defensive Rating. The formula for this is: Offensive Rating - Defensive Rating.

Player	TEAM	AGE	GP	W	L	MIN	OffRtg	DefRtg	NetRtg	AST%	AST/TO	AST Ratio	OREB%	DREB%	REB%	TO Ratio	eFG%	TS%	USG%	PACE	PIE
Aaron Brooks	CHI	31	12	6	6	3	113.0	119.2	-6.2	15.8	1.00	12.7	3.3	12.5	8.1	12.7	60.0	62.4	24.8	95.71	8.7
Aaron Gordon	ORL	20	27	9	18	3	92.9	102.2	-9.4	7.1	1.50	11.3	10.7	31.5	22.0	7.5	43.3	53.2	13.2	102.62	17.1
Adreian Payne	MIN	25	2	1	1	0	0.0	100.0	-100.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	211.76	0.0
Al Horford	ATL	29	40	21	19	4	108.2	104.5	3.7	8.6	1.17	8.9	6.9	16.8	11.8	7.7	58.2	59.6	19.6	100.02	12.0
Al Jefferson	CHA	31	9	4	5	3	88.3	84.0	4.2	9.1	0.00	8.3	8.8	15.2	11.9	0.0	36.4	36.4	18.7	82.65	10.5
Al-Farouq Aminu	POR	25	32	17	15	3	111.7	111.9	-0.2	6.5	1.00	10.1	8.7	24.4	16.5	10.1	31.7	36.2	15.3	105.03	6.0
Alan Anderson	WAS	33	1	0	1	5	95.8	102.5	-6.6	33.3	0.00	50.0	0.0	16.7	11.1	0.0	0.0	0.0	7.4	103.49	0.0
Alec Burks	UTA	24	14	4	10	4	101.0	113.4	-12.4	16.7	1.33	10.6	0.0	11.1	5.3	7.9	56.7	58.3	28.7	102.42	13.0
Alex Len	PHX	22	20	7	13	2	90.9	126.4	-35.6	0.0	0.00	0.0	6.2	12.5	9.4	15.4	54.5	54.5	12.0	100.41	3.2
Alex Stepheson	MEM	28	1	0	1	0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	564.71	0.0
Alexis Ajinca	NOP	28	6	2	4	2	58.1	122.5	-64.4	0.0	0.00	0.0	0.0	25.0	12.5	25.0	33.3	33.3	23.3	95.82	0.0
Allen Crabbe	POR	24	37	20	17	2	113.2	112.3	0.9	9.8	6.00	23.6	3.4	9.1	6.3	3.9	63.9	65.1	8.4	108.08	8.0

METHODOLOGY

GENERAL STATS | CLUTCH STATS | HUSTLE STATS | SHOOTING | OPPONENT SHOOTING | PLAYER BIOS | GAME LOGS | PL

Player Impact Estimate - PIE is an estimate of a player's or team's contributions and impact on a game. PIE shows what % of game events did that player or team achieve.

2015-16 REGULAR SEASON CLUTCH ADVANCED STATS

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Al Horford	ATL	29	40	21	19	4	108.2	104.5	3.7	8.6	1.17	8.9	6.9	16.8	11.8	7.7	58.2	59.6	19.6	100.02	12.0
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Alan Anderson	WAS	33	1	0	1	5	95.8	102.5	-6.6	33.3	0.00	50.0	0.0	16.7	11.1	0.0	0.0	0.0	7.4	103.49	0.0
Alec Burks	UTA	24	14	4	10	4	101.0	113.4	-12.4	16.7	1.33	10.6	0.0	11.1	5.3	7.9	56.7	58.3	28.7	102.42	13.0
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METHODOLOGY

$$Offensive\ Win\ Shares = \frac{Marginal\ Offense}{Marginal\ Points\ Per\ Win}$$
$$= \frac{Player\ Points - 0.92 \times League\ Points\ Per\ Possession \times Player\ Possessions}{0.32 \times League\ Points\ Per\ Game \times \frac{Team\ Pace}{League\ Pace}}$$

$$Defensive\ Win\ Shares = \frac{Marginal\ Defense}{Marginal\ Points\ Per\ Win}$$
$$= \frac{\frac{Player\ Minutes}{Team\ Minutes} \times Team\ Defensive\ Possessions \times \left(1.08 \times League\ Points\ Per\ Possession - \frac{Defensive\ Rating}{100}\right)}{0.32 \times League\ Points\ Per\ Game \times \frac{Team\ Pace}{League\ Pace}}$$

Win Shares = Offensive Win Shares + Defensive Win Shares

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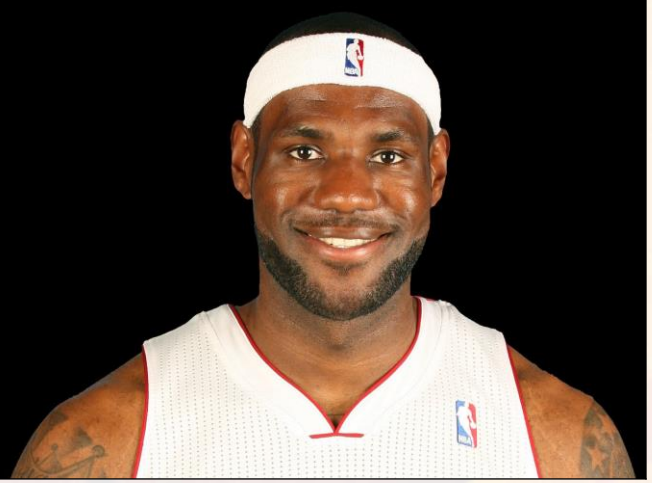
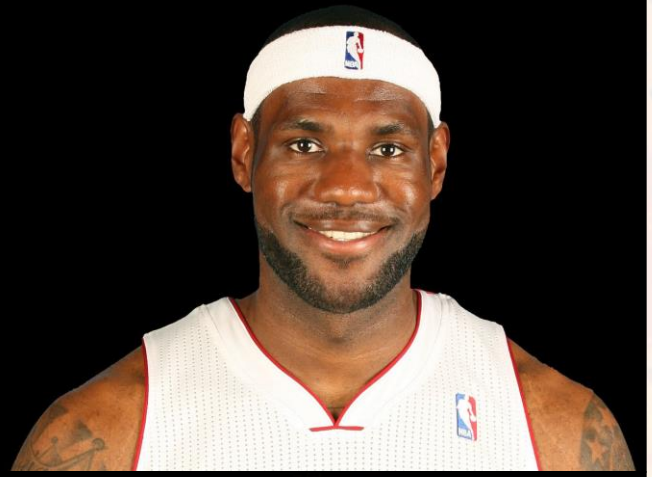
COMEBACK CLUTCHNESS MVPS

Season	Win Shares Per 48	Net Rating	PIE
2015-2016			
2014-2015			

COMEBACK CLUTCHNESS MVPS

Season	Win Shares Per 48	Net Rating	PIE
2013-2014			
2012-2013			

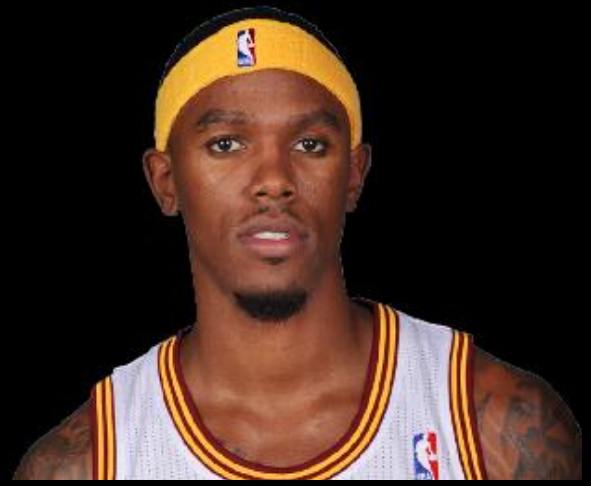
COMEBACK CLUTCHNESS MVPS

Season	Win Shares Per 48	Net Rating	PIE
2011-2012			
2010-2011			

COMEBACK CLUTCHNESS MVPS

Season	Win Shares Per 48	Net Rating	PIE
2009-2010			
2008-2009			

COMEBACK CLUTCHNESS MVPS

Season	Win Shares Per 48	Net Rating	PIE
2007-2008			
2006-2007			

COMEBACK CLUTCHNESS MVPS

Season	Win Shares Per 48	Net Rating	PIE
2005-2006			
2004-2005			

COMEBACK CLUTCHNESS MVPS

Season	Win Shares Per 48	Net Rating	PIE
2003-2004			
2002-2003			

COMEBACK CLUTCHNESS MVPS

Season	Win Shares Per 48	Net Rating	PIE
2001-2002			

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VALUE OF COMEBACK CLUTCHNESS

Rank by Differential	Player	Comeback Clutchness Win Shares Per 48	Regular Win Shares Per 48	Differential
1	Andre Drummond	1.10	0.13	0.97
2	Draymond Green	1.06	**0.19**	0.87
3	Klay Thompson	0.90	0.14	0.76
4	Stephen Curry	1.06	0.32	0.74
5	Dirk Nowitzki	0.87	0.14	0.73
6	Deron Williams	0.79	0.08	0.71
7	Chandler Parsons	0.78	0.11	0.67
8	Jeff Green	0.70	0.07	0.63
9	LeBron James	0.85	0.24	0.61
10	Jeremy Lin	0.68	0.08	0.60

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COMEBACK VS. ESCAPE CLUTCHNESS WS/48

F-Test Two-Sample for Variances		
	Ahead	*Behind*
Mean	0.399744153	0.314479098
Variance	0.116108959	0.115400413
Observations	1630	1630
df	1629	1629
F	1.006139892	
P(F<=f) one-tail	0.450852491	
F Critical one-tail	1.084946995	

F < F Critical one-tail so assume equal variance
(note though: p-value > 0.05)

t-Test: Two-Sample Assuming Equal Variances		
	Ahead	*Behind*
Mean	0.399744153	0.314479098
Variance	0.116108959	0.115400413
Observations	1630	1630
Pooled Variance	0.115754686	
Hypothesized Mean Difference	0	
df	3258	
t Stat	7.154521473	
P(T<=t) one-tail	5.16225E-13	
t Critical one-tail	1.645321462	
P(T<=t) two-tail	1.03245E-12	
t Critical two-tail	1.960692388	

t >> t Critical two-tail so **significantly different**
(note: p-value << 0.05)

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CLUTCH (BEHIND) VS. REGULAR WS/48

F-Test Two-Sample for Variances		
	Behind	*Regular*
Mean	0.283649742	0.11589044
Variance	0.120707021	0.002725993
Observations	1862	1862
df	1861	1861
F	44.28001294	
P(F<=f) one-tail	0	
F Critical one-tail	1.079261758	

F >> F Critical one-tail so unequal variance
(note: p-value << 0.05)

t-Test: Two-Sample Assuming Unequal Variances		
	Behind	*Regular*
Mean	0.283649742	0.11589044
Variance	0.120707021	0.002725993
Observations	1862	1862
Hypothesized Mean Difference	0	
df	1945	
t Stat	20.60443832	
P(T<=t) one-tail	8.74521E-86	
t Critical one-tail	1.645637431	
P(T<=t) two-tail	1.74904E-85	
t Critical two-tail	1.961184408	

t >> t Critical two-tail so **significantly different**
(note: p-value << 0.05)

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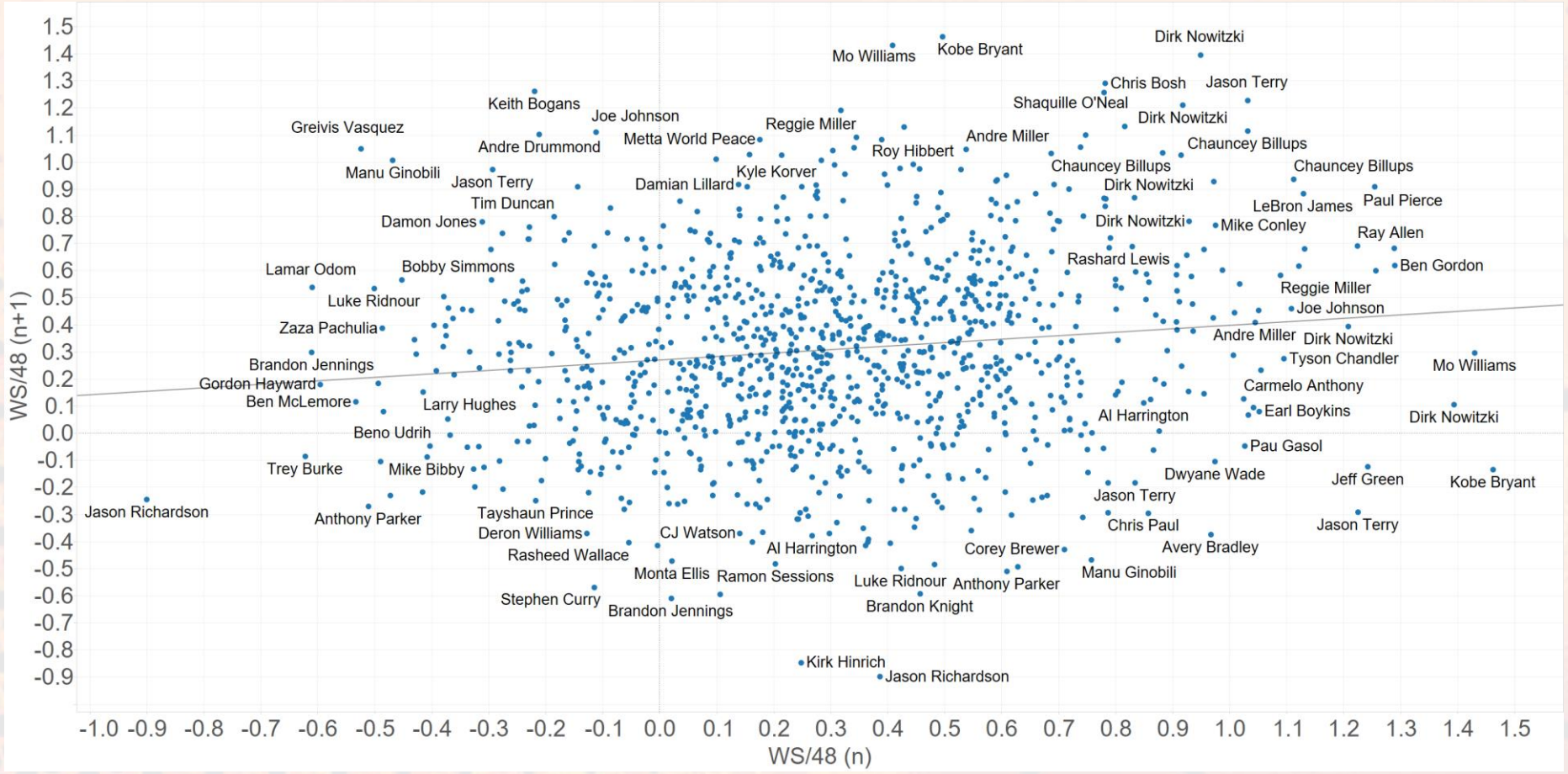
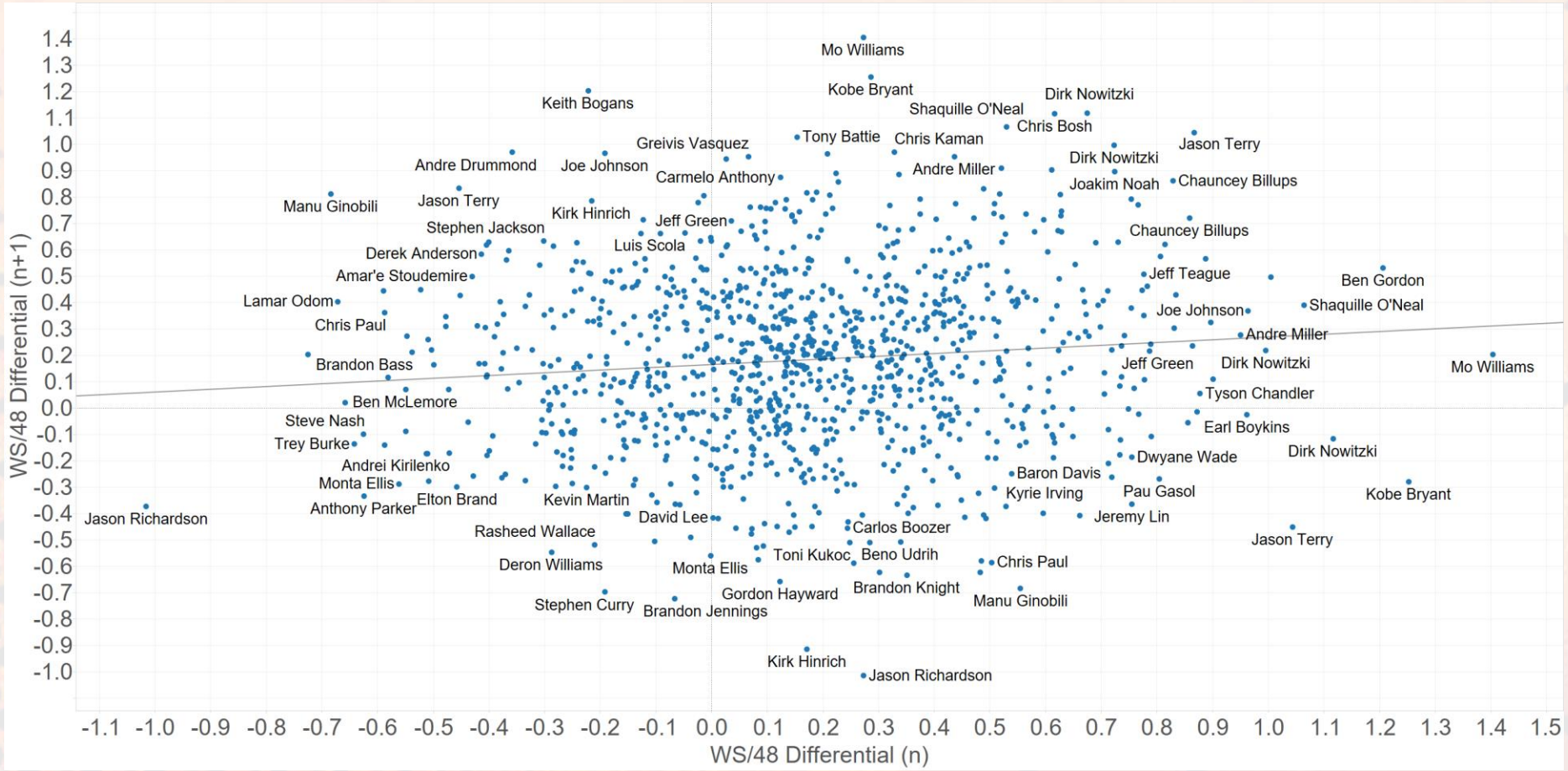
YTY CORRELATION OF WS/48



R-Squared = 0.02 (**no correlation**)

YTY CORRELATION OF WS/48 DIFFERENTIAL



R-Squared = 0.01 (**no correlation**)

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CONCLUSION

- Comeback clutchness is…
  - just noise (i.e. rarely repeatable)
  - significantly different from regular season performance
  - significantly different from escape clutchness
  - more valuable when the player's team has middle-of-the-road talent
  - fun to think about
- Many limitations on the data set but future work could focus on…
  - adjusted plus-minus (pending play-by-play data scraping)
  - PIE (gives more intuitive results but does not adjust for pace)