Pace and Power: Removing unconscious bias from soccer broadcasts

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In collaboration with Sportlogiq

SPORT LOGiQ

Pace and Power

Senegal are more than their 'pace and power'

Senegal beat Poland in their World Cup match not because of their physicality, but because they were the better team.

By Zito Madu | @_Zeets | Jun 19, 2018, 4:30pm EDT |

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Photo by Shaun Botterill/Getty Images

Paul Pogba's 'pace and power' stresses need for rethink over BAME coverage

Sachin Nakrani

Language used to describe Frenchman's revival highlights importance of the debate sparked by Raheem Sterling

▲ Paul Pogba's physical attributes are often praised rather than his creative and technical prowess. Photograph: Oli Scarff/AFP/Getty Images

Research on Racial Bias in Professional Sport

- College basketball commentators describe Black players as "naturally athletic, quick and powerful" while White players "touted for their hard work, effort and mental skill" - *Eastman and Billings 2001*

- NFL Draft profiles focus much more on Black players physical characteristics - race of a player is more likely indicator weight will be mentioned in profile than actual weight of player - *Boylan, McMahon and Munro 2017*

- Strikes more likely to be called if umpire and pitcher match race - *Parsons et al 2007*

- Popular Dutch soccer program found comments about physicality twice as likely to be made about Black players - *van Sterkenburg, Knoppers and de Leeuw 2012*
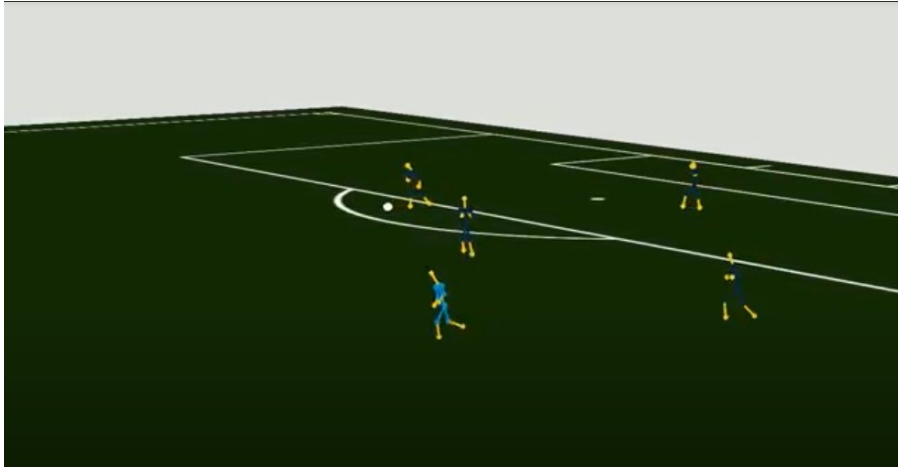
Gender Wage Gap

Soccer's Embarrassing Gender Wage Gap

Total annual salary of the top-7 women's soccer leagues in 2017

League		Salary
D1 Féminine	🇫🇷	$13.6m
Frauen Bundesliga	🇩🇪	$12.2m
FA Women's Super League	🏴󠁧󠁢󠁥󠁮󠁧󠁿	$5.5m
National Women's Soccer League	🇺🇸	$5.4m
Damallsvenskan	🇸🇪	$3.4m
W-League	🇦🇺	$1.7m
Liga MX Femenil	🇲🇽	$838,656

Neymar's annual Salary At PSG
$43.8m*

Top 7 Women's Soccer Leagues
$42.6m

@StatistaCharts   * Converted from GBP to USD on 27/11/17
Source: Sporting Intelligence
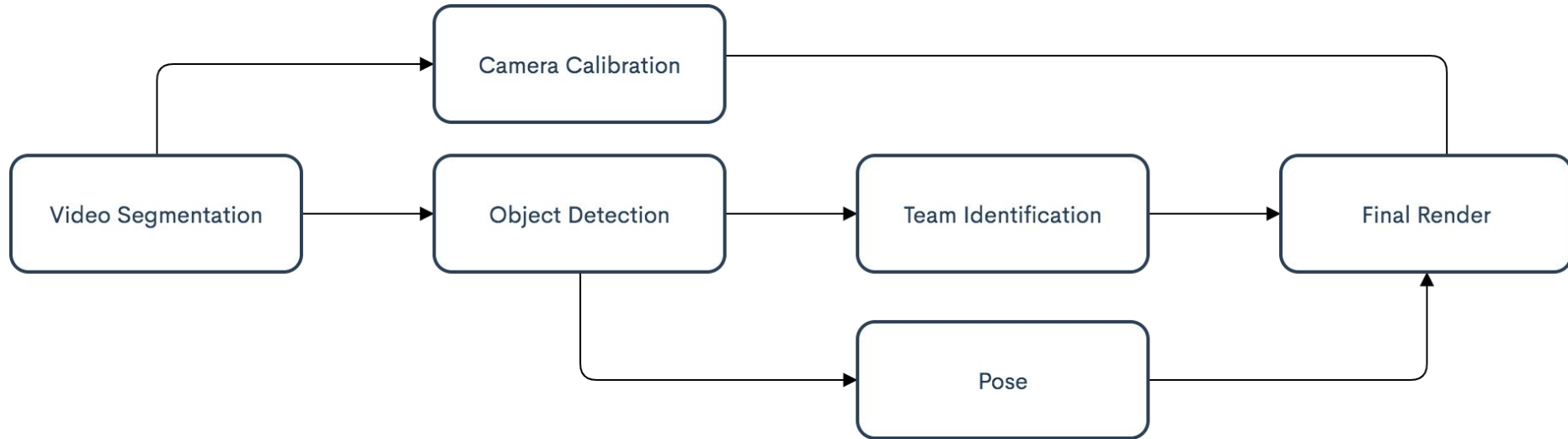
Forbes   **statista**

Computer Vision: Creating 2D Renders

Broadcast Renders

CV Pipeline

CV Pipeline

1. Video Segmentation: Separate game play from cutaways, replays etc.

2. Human/Object Detection: Bounding boxes around players and ball

3. Team Identification: Based on jersey colour identify team

4. Pose: Generate 2D skeletons

5. Camera Calibration: Estimate position and orientation of camera to convert broadcast coordinates to on-pitch coordinates

Pipeline uses a Convolutional Neural Net based-architecture and a PTZ model to make generated template smooth and stable.

Survey

Survey Set-Up

- Survey sample split into two groups half given original video other half skeletal recreations

- 105 responses - 58 skeletal recreations, 47 original video broadcasts

- Video A: NWSL Championship, North Carolina Courage 4 - 0 Chicago Red Stars, October 27, 2019

- Video B: EFL League 2 (English 4th division), Crawley Town 4 -0 Swindon Town, October 26, 2019

- Video C: 2018 World Cup Group Stage, Poland 1 - 2 Senegal, June 19, 2018

- Questions are identical except for team identifiers and additional quality control questions given to skeletal recreation group "ex. How well can you follow what is happening"

Survey Questions

Hypothesis	Match	Main Survey Question
Gender Bias in Assessment of the Quality of the Play	Video A: NWSL Championship, North Carolina Courage 4 - 0 Chicago Red Stars, October 27, 2019	Comparing the quality of play in Video A to Video B
	Video B: EFL League 2 (English 4th division), Crawley Town 4 -0 Swindon Town, October 26, 2019	
Racial Bias in Assessment of the Style of the Play	Video C: 2018 World Cup Group Stage, Poland 1 - 2 Senegal, June 19, 2018	Comparing the playing styles of the two teams in Video C

Self-Identified Level of Soccer Fan
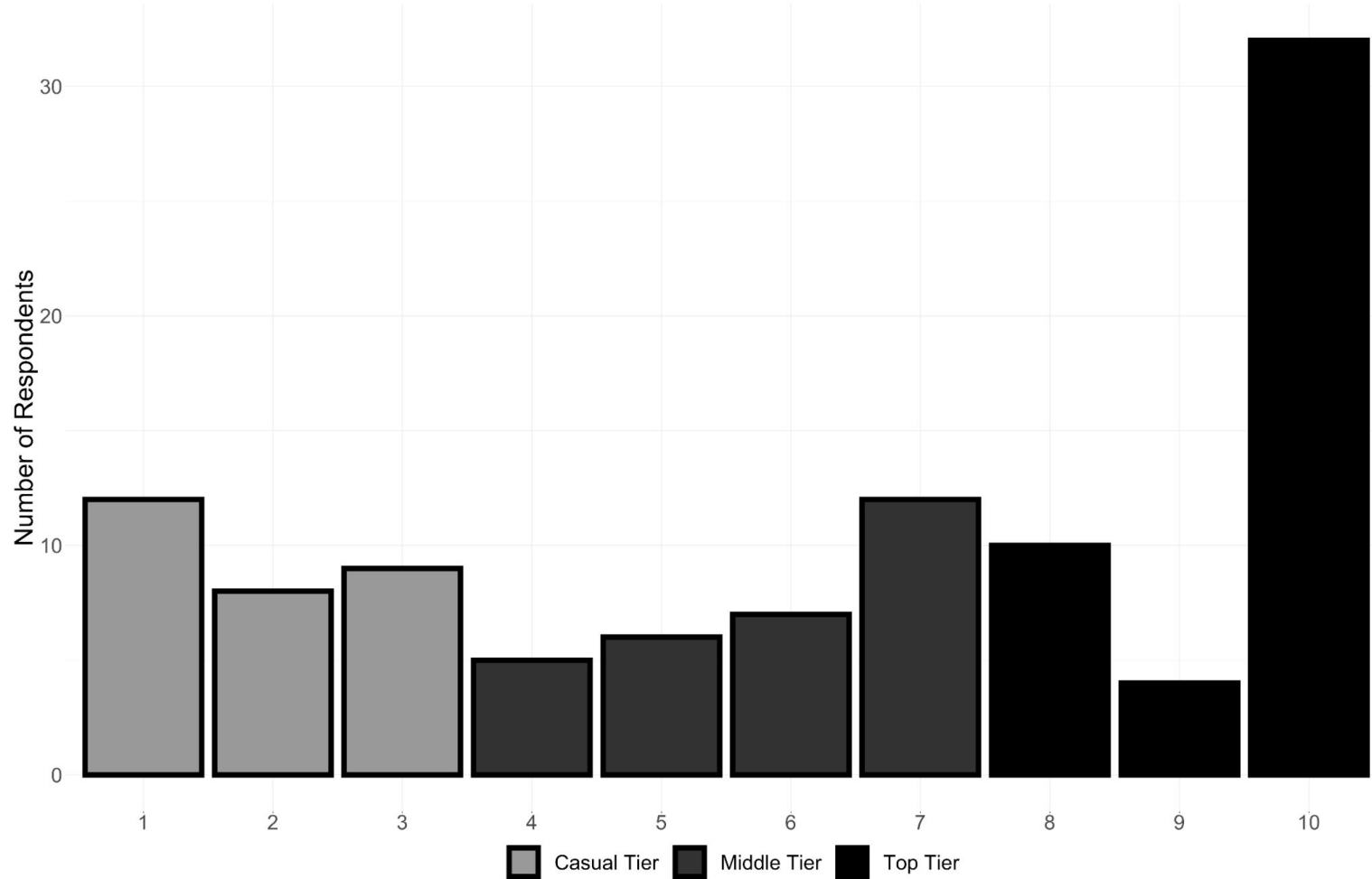
Effect of Gender in Quality of Play Assessment

# Which game had a high quality of play?
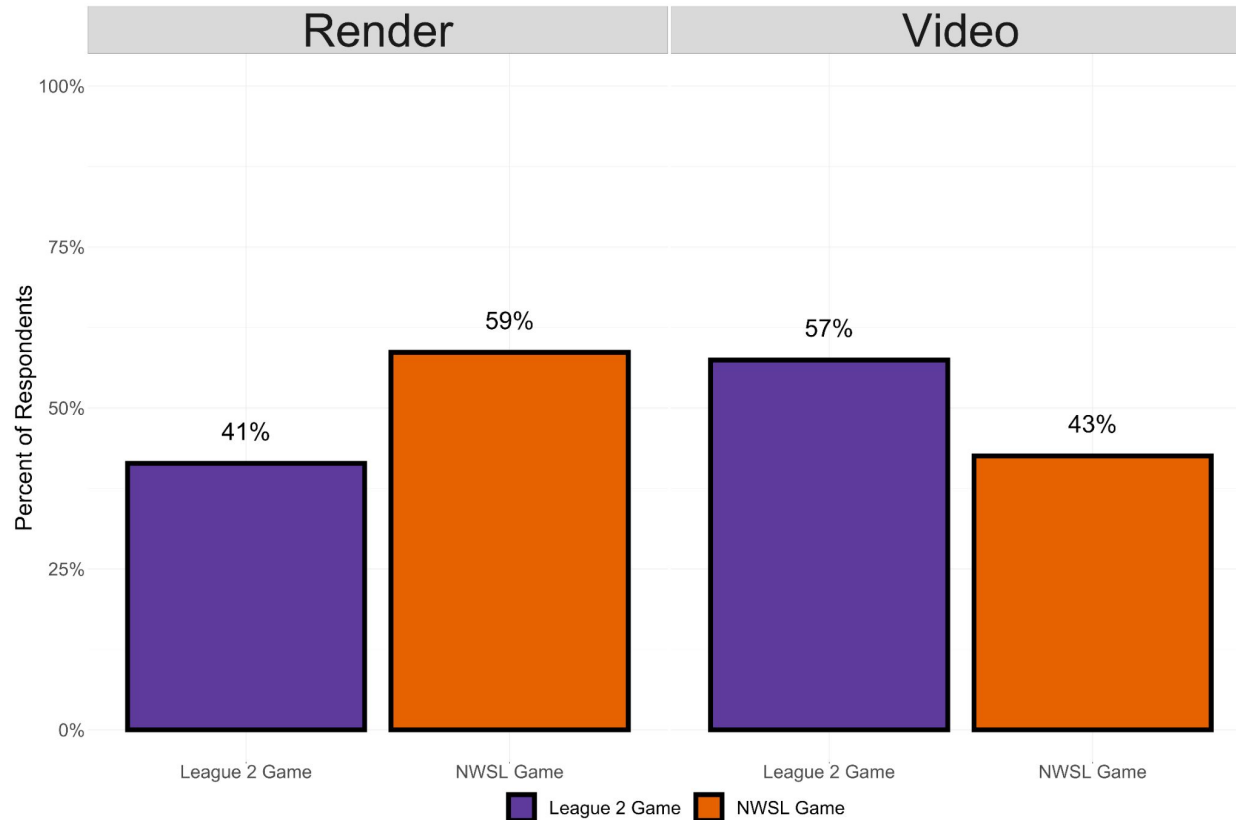
Study 1 Results: Gender Bias

	Recreations (n=58)	Original Broadcast (n=47)	*t*-value	p-value
NWSL Game	34 *(59 %)*	20 *(43 %)*	1.643	0.103
League 2 Game	24 *(41 %)*	27 *(57 %)*		

- A greater proportion of respondents said the NWSL game was of a higher quality if they saw the 2D render

- The difference in responses across the two groups is not enough to overturn the null hypothesis that the perception of quality of play between these two matches is indifferent to whether or not viewers can identify the gender of players involved

Effect of Race in Tactical Assessment
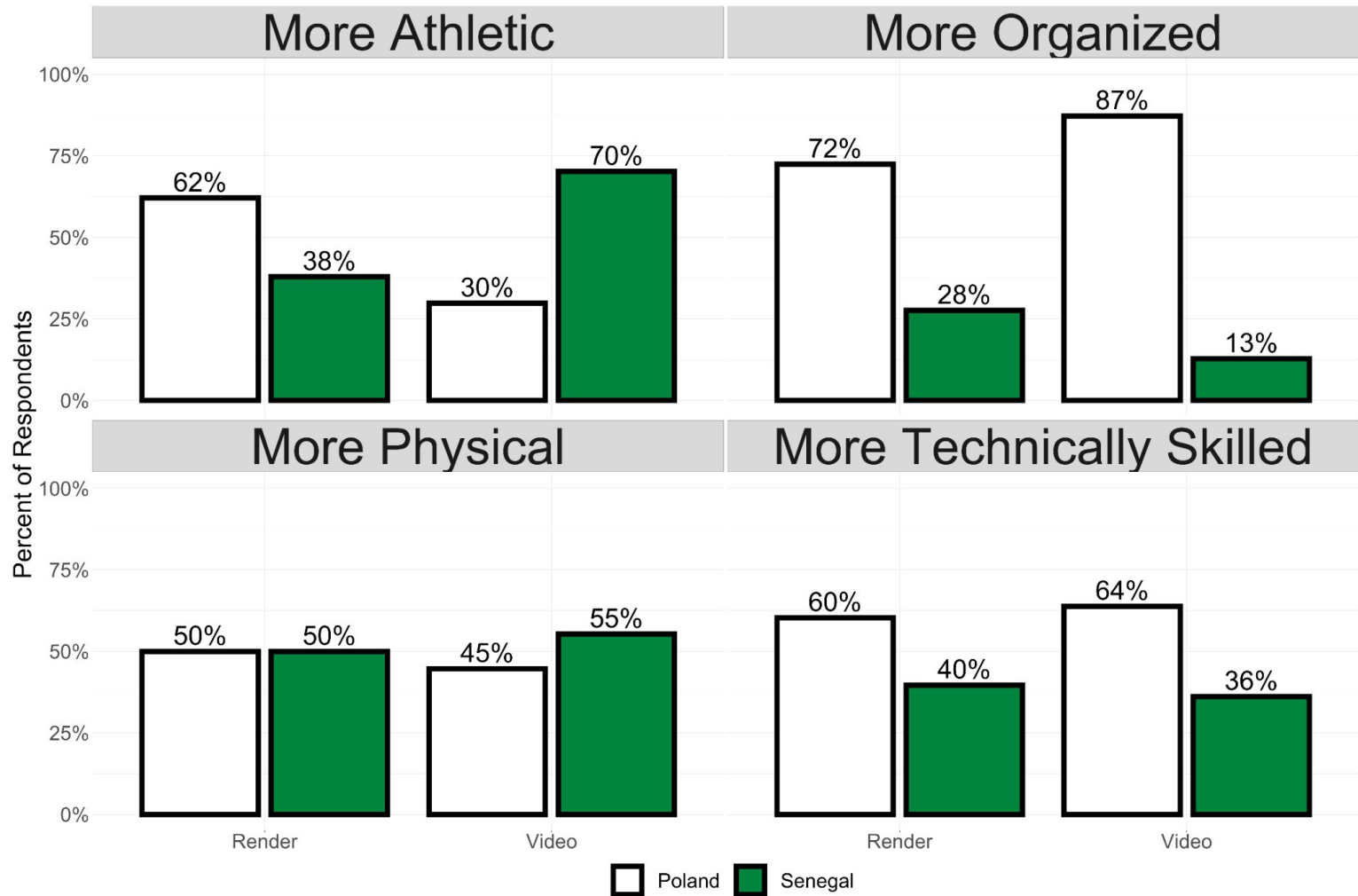
Study 2 Results: Racial Bias

More athletic: Poland or Senegal

	Render (n=58)	Original Broadcast (n=47)	*t*-value	p-value (H-S adjusted)
Poland	36 *(62 %)*	14 *(30 %)*	3.445	0.003**
Senegal	22 *(38 %)*	33 *(70 %)*		

More organized: Poland or Senegal

	Render (n=58)	Original Broadcast (n=47)	*t*-value	p-value (H-S adjusted)
Poland	42 *(72 %)*	41 *(87%)*	1.869	0.181
Senegal	16 *(28 %)*	6 *(13 %)*		

More physical: Poland or Senegal

	Render (n=58)	Original Broadcast (n=47)	*t*-value	p-value (H-S adjusted)
Poland	29 *(50 %)*	21 *(45 %)*	0.538	0.833
Senegal	29 *(50 %)*	26 *(55 %)*		

More technically skilled: Poland or Senegal

	Render (n=58)	Original Broadcast (n=47)	*t*-value	p-value (H-S adjusted)
Poland	35 *(60 %)*	30 *(64 %)*	0.362	0.833
Senegal	23 *(40 %)*	17 *(36 %)*		

Conclusions

Limitations

- 105 respondents is still a small sample size - relatively homogenous group (lots of soccer fans, mostly men)

- Clips picked mostly at random but relatively short (to ensure high participation rate)

- CV technology is very good but still not a perfect re-creation of the match

- There are other confounding factors that may be outside of the scope of race or gender which affects the responses

Conclusions

- Results are in-line with the vast majority of literature on the effects of race and gender bias in sports

- First time these sources of bias have been tested with a control group unaware of the race or gender of players involved

- Provides a template to remove physically-defining features in analyzing sports that may have future applications in scouting, coaching, media and broadcasting

- Right now a tool to challenge stereotypes more than replace existing processes

Acknowledgements

Questions