Performance Benchmarks June 2020

Know the Stats that Matter

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Performance Benchmarks FOR THE REST OF US

- There are lots of stats shared at clinics run by USAV, AVCA, GMS, AOC

- However, the bulk of the data is high end
  - FIVB international play
  - Olympic stats
  - NCAA Division 1

- But what about the "rest of us"?
  - D2, D3, NAIA, Junior College
  - High School – JV and Varsity
  - Middle School
  - Club 12-18s

Goals

- For Your Level of Play
  - Know the Stats that Drive WINNING
  - The key performance benchmark numbers
  - Stats that are easiest to influence through training

The Data Source: **SoloStats WebReports**

- More than 40 million stat entries

- Analyzed over 1 million sets for this presentation

- Breakdowns by level and age

- Available in WebReports for SoloStats users

How We Analyzed the Data

- Purged bad matches and games
  - Scrimmages
  - Incomplete matches
  - Teams with less than 10 matches

- Look at the underlying stats to make sure they have consistency
  - All sets are 25 points for consistency
  - Valid values of stats like kills and digs
  - Counts relative to scores
  - We don't use in-rally counts for attacks because numbers are not consistent hence no HE or K%

Correlation to Winning or Losing

- Does a specific Stat correlate to winning or losing

- Counted the number of wins vs losses

- Here's an example of # of Aces (x axis) compared to Win % (wins/wins+losses)

- You can see that for Club 18s at 3 or more Aces your chances of winning exceed 65%

- Used Pearson correlation

club18

# of Aces
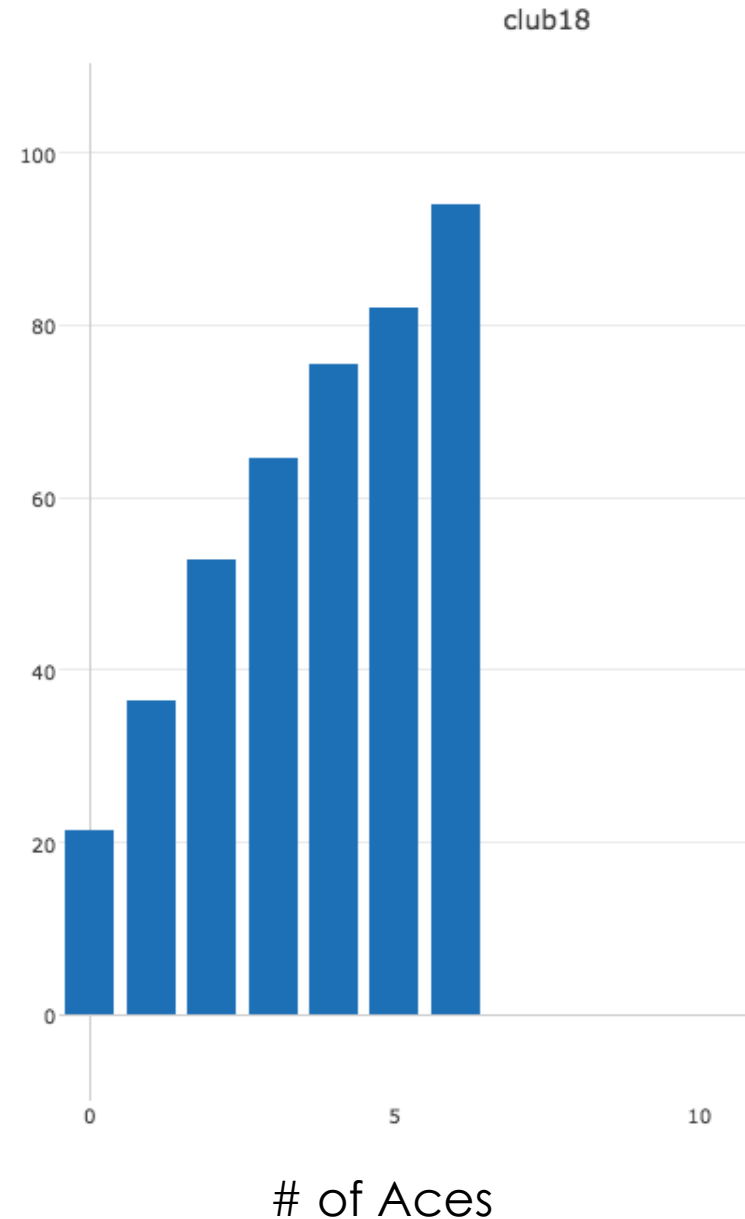
Number of Sets per Level
From Over 23,000 Teams

Female
- High School Varsity: 384,446
  - Club 16: 134,219
- High School JV: 99,691
  - Club 14: 89,416
  - Club18: 81,036
  - University: 60,401
  - Club 12:   20,450
- Middle School: 19,698
- Junior College: 14,314

Male
- High School Varsity: 41,804
  - University: 10,532
- High School JV: 10,105
  - Club18: 8,896
  - Club 16: 6,716
  - Club 14: 2,922
- Middle School: 1,335
  - Club 12: 698
- Junior College: 915

General Comments

- Rankings for your team is provided automatically in WebReports if you take stats in SoloStats
  - http://www.solostatslive.com/performance-benchmarks.html

- We are continuously improving our understanding for the results

- You can contribute to the analysis.
  - Email – kyle@rotate123.com
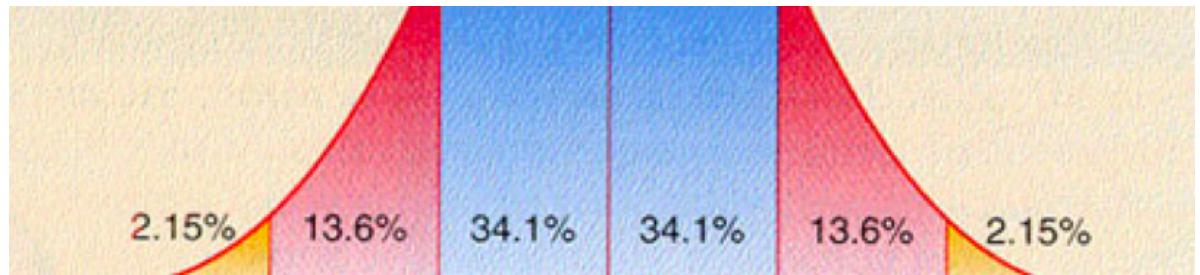
Key Correlations

BY LEVEL OF PLAY

Look at Key Stats per Set Win or Loss

- Serve Attempts

- Aces

- Serve Errors

- Passing Rating

- Passing Errors

- Dig

- Dig Error

- Attack Attempts

- Kills

- Attack Errors

- Block

- Block Errors

- Side Out %
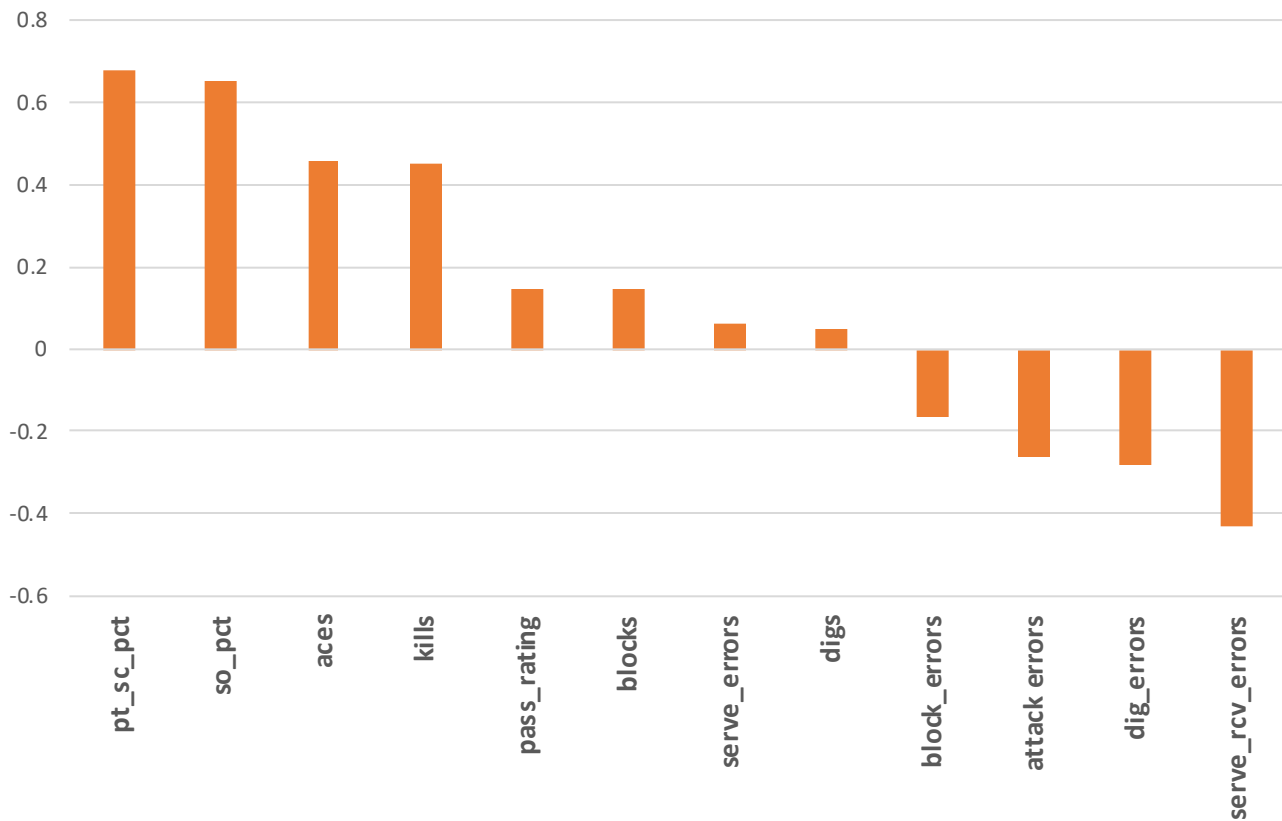
- Point Score %
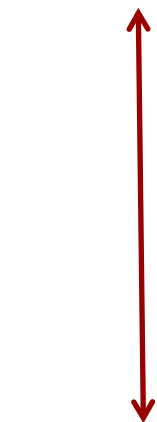
One Example – High School Varsity

- Chose high school varsity because it's the largest data set for a single level of play

- Look at correlations of stats relative to winning or losing

- Then look at each stat's relationship to Win%

High School Correlation

Girl's High School Varsity

Positive Correlation

Negative Correlation

More Wins

More Losses

x-axis labels: pt_sc_pct, so_pct, aces, kills, pass_rating, blocks, serve_errors, digs, block_errors, attack errors, dig_errors, serve_rcv_errors

y-axis: 0.8, 0.6, 0.4, 0.2, 0, -0.2, -0.4, -0.6

Analysis

- Point Scoring and Side Outs being important is pretty obvious

- Aces and Kills - higher priority over Pass Rating is a bit of a surprise

- Dig not being important is also surprising

- Serve Receive Errors is the largest negative correlation
  - makes sense since it is the inverse of Aces

Tipping Point

- For each important stat, what does the curve look like? Is it linear or is there a point at which winning or losing increases dramatically?
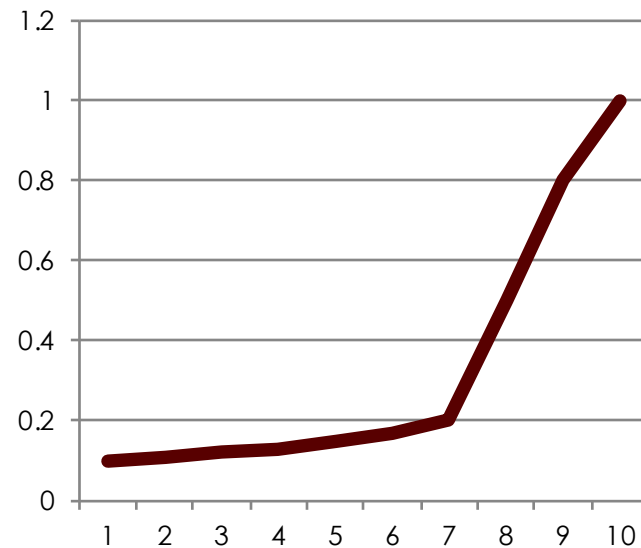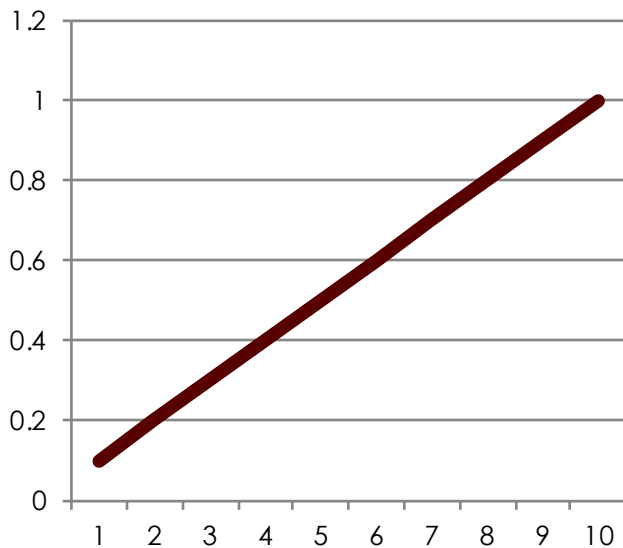
How to Use Stats

- It's important to note that these are statistical averages and since a rally is a continuous series of touches each stat has an impact on another

- We need to think in terms of groups of stats.
  - Example:
  - If you hold all factors the same and increase the Kill rate by 2 kills how does that change the probable outcome?
 - It's a Probability NOT an exact Outcome

High School
Point Scoring %

- At 50% Point Scoring, Win Rate is 60%

- At 60% PS, Wins go to 80%

- Difficulty is that high Point Scoring rates are difficult at higher levels of play since SO% is high (the inverse of PS%)
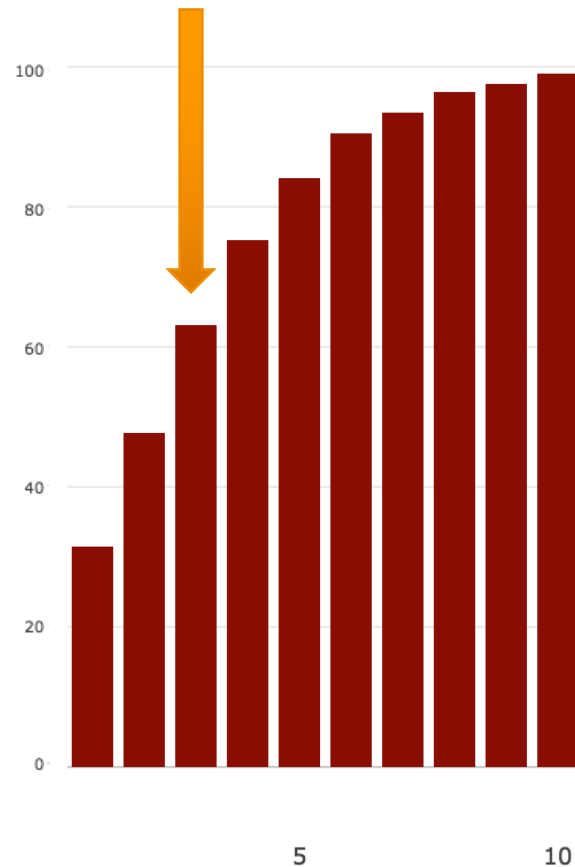
50% PS = 60% wins
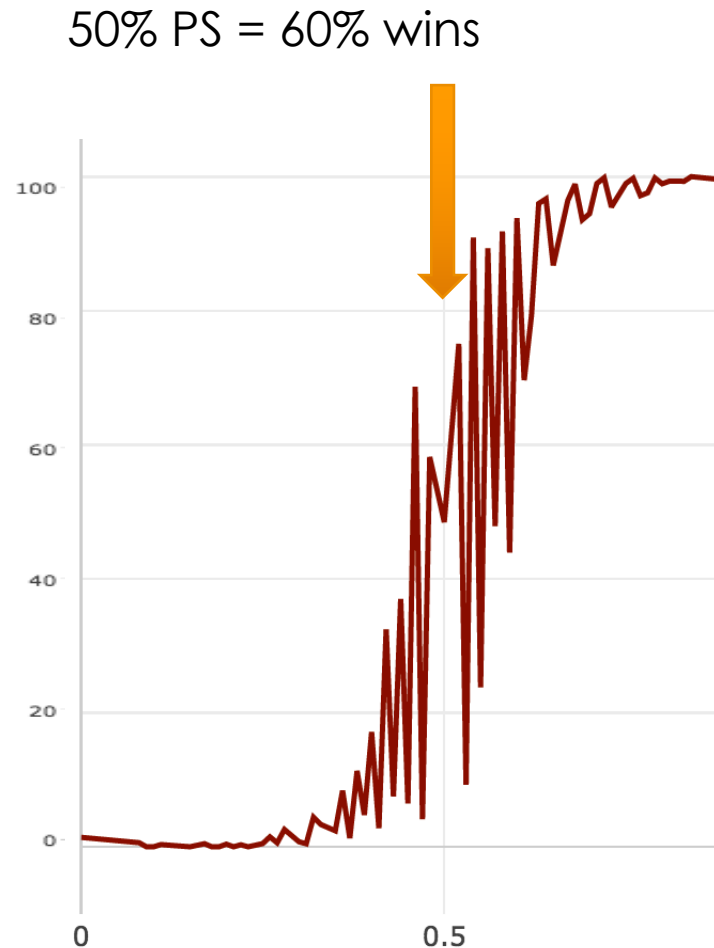
High School Side Out %

- Not surprisingly a 50% SO percentage gives you about a 50% win rate

- At 55%+ SO, Win % Exceeds 60%

50% SO = 50+% wins
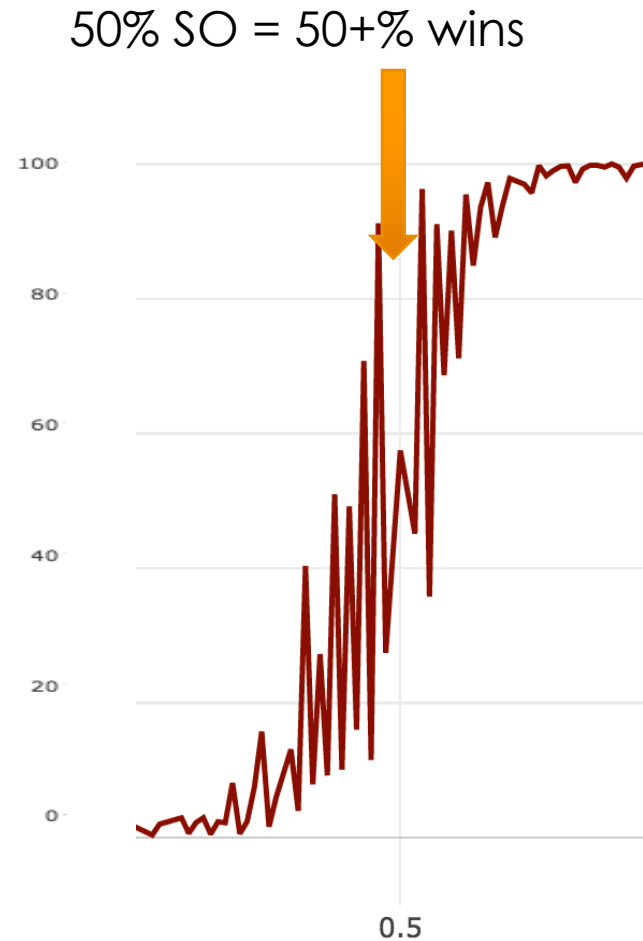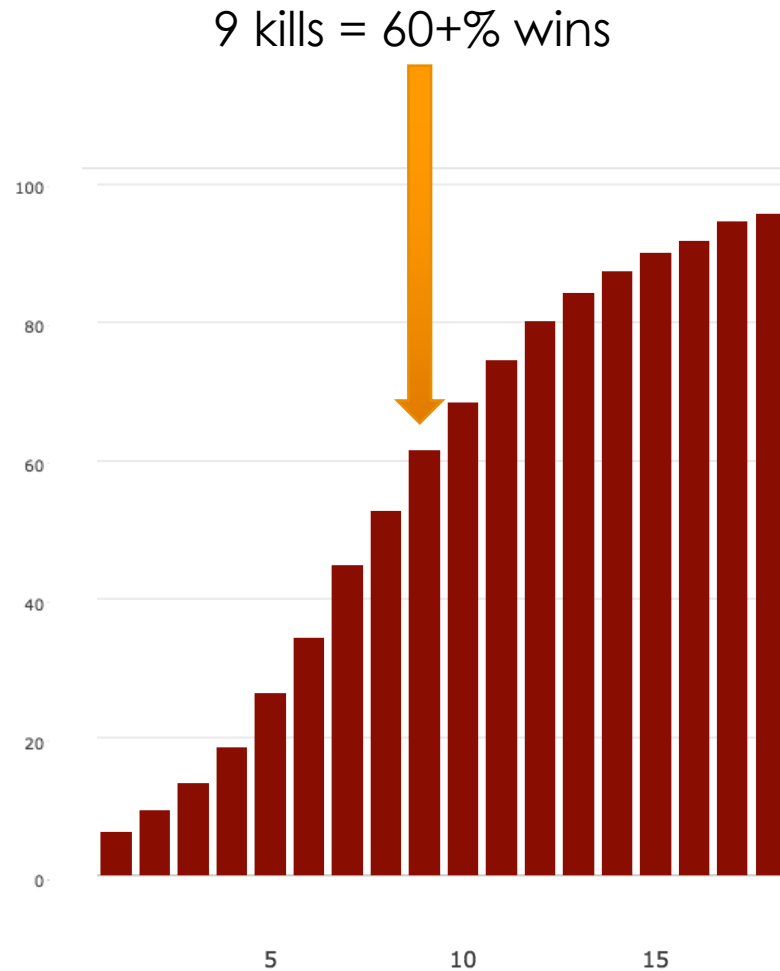
High School Aces

- At 2 Aces your win rate is 50%

- Anything above increases your win rate

3 aces = 60+% wins

High School Kills

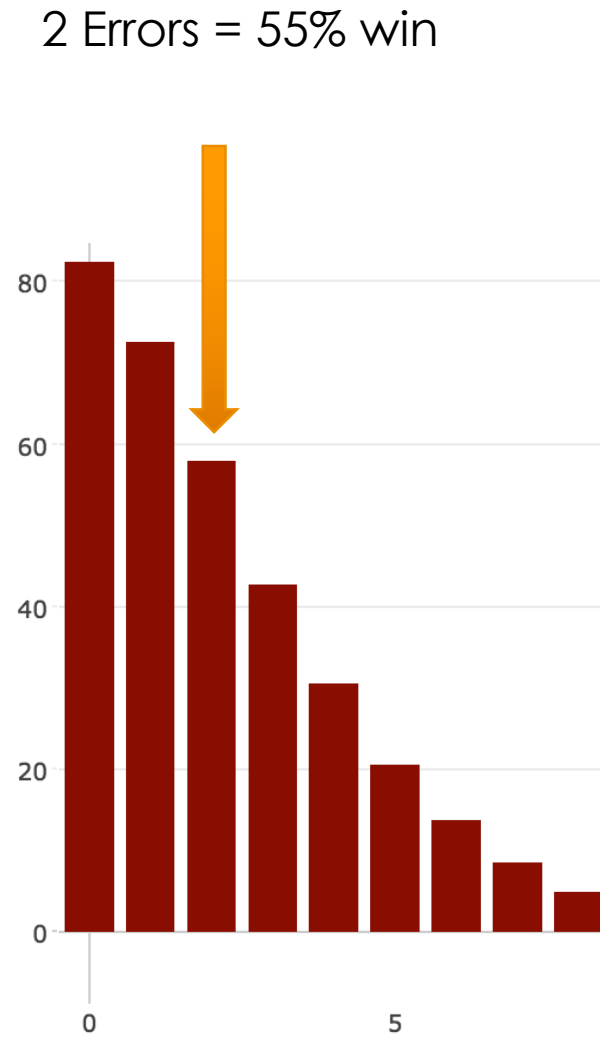- At 8 Kills per Game, you are above 50 % win rate
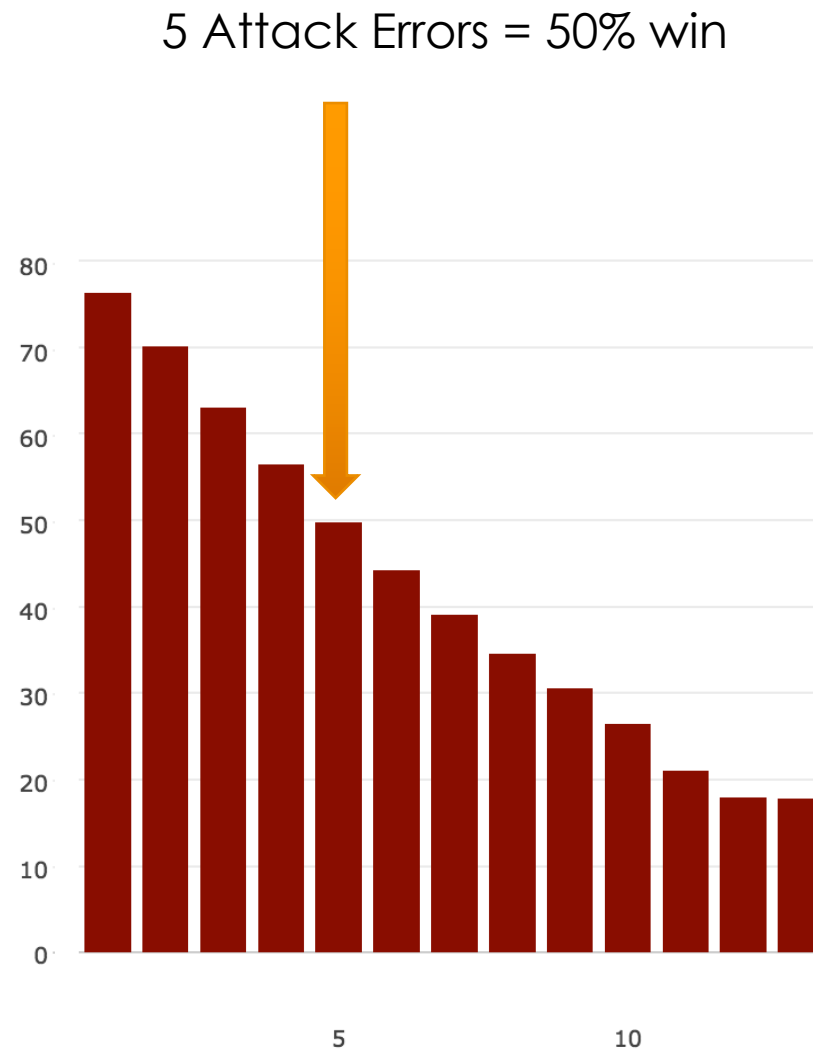
- At 12 Kills = 80% win rate

9 kills = 60+% wins

High School Receive Errors

- 3 or more Receive Errors per Game will dramatically increase your Losses

2 Errors = 55% win
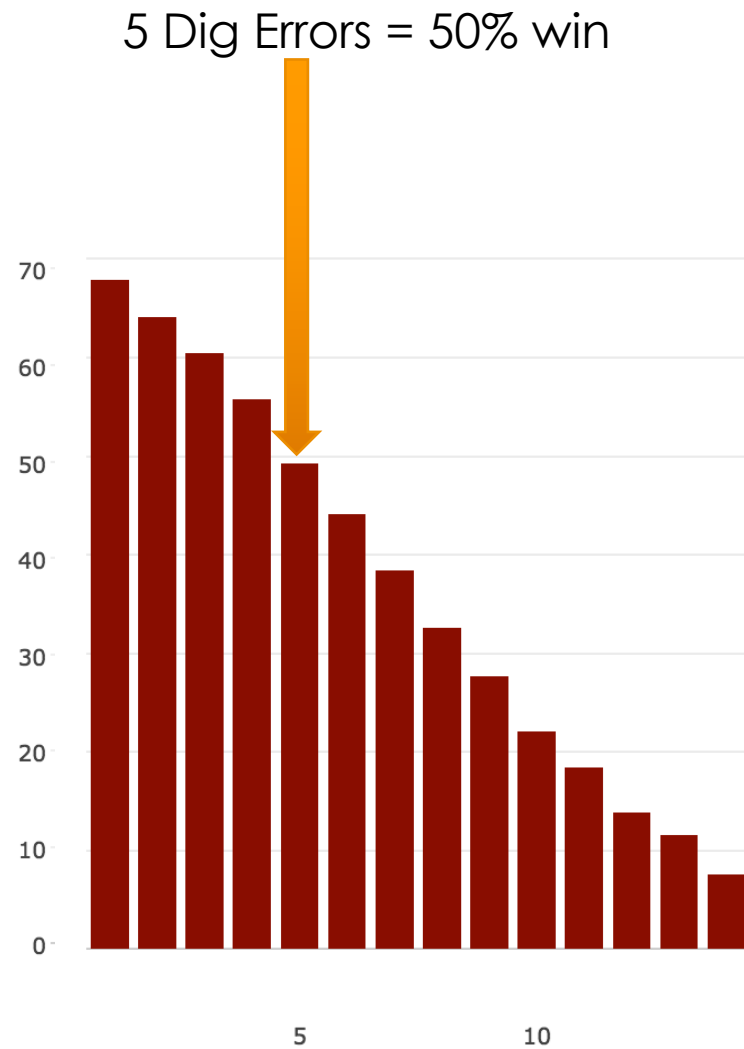
High School Attack Errors

- 5 or more Attack Errors per Game, losses will increase

5 Attack Errors = 50% win

High School Dig Errors

- 5 or more Dig Errors per Game, losses will increase

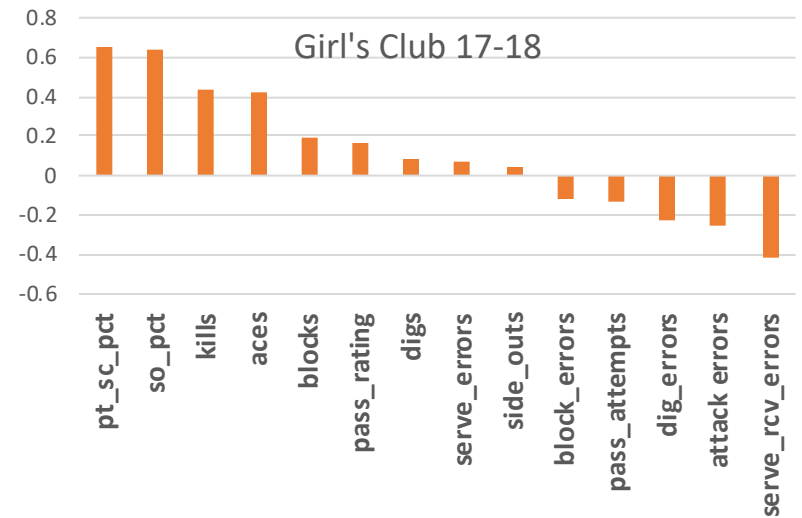5 Dig Errors = 50% win

Comparison of Stats by Level
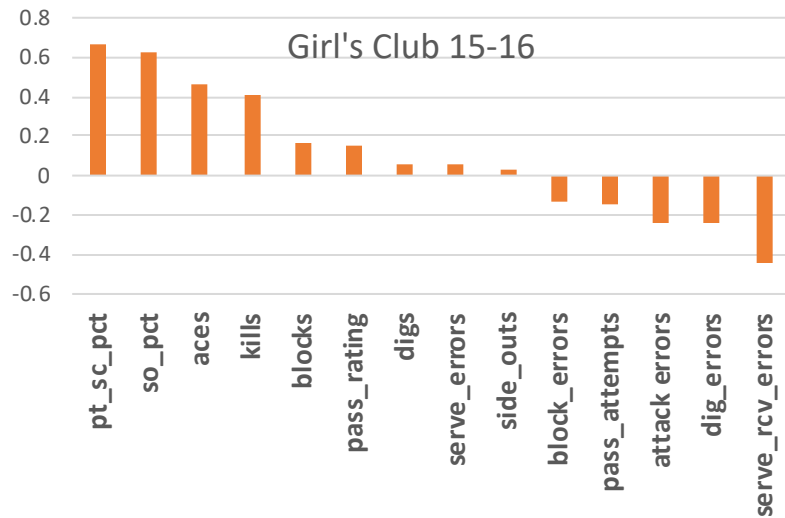
How Correlations Change with Age and Skill

Compare Correlations by Level/Age Groups

- Some stats will change in importance

- Second level details will also change as curves will shift and change in slope

- Will provide a summary table of key stats in order of importance and actual Tipping Point value

Stats vs Winning/Losing – Female
Club Data

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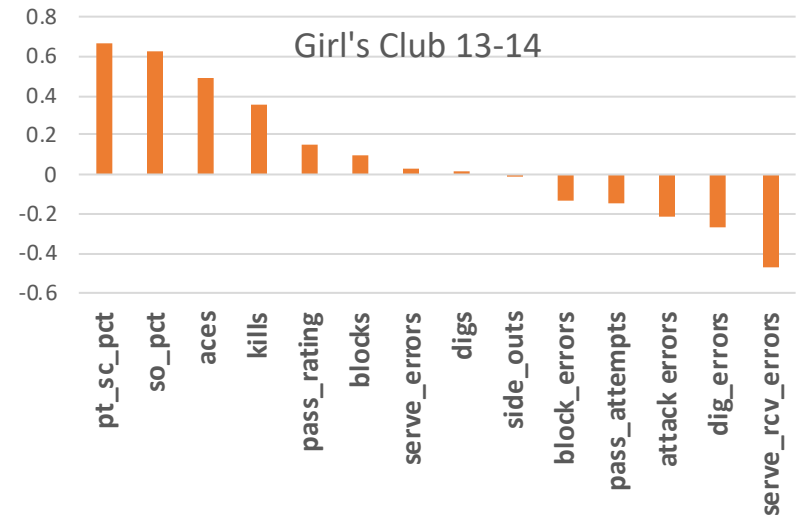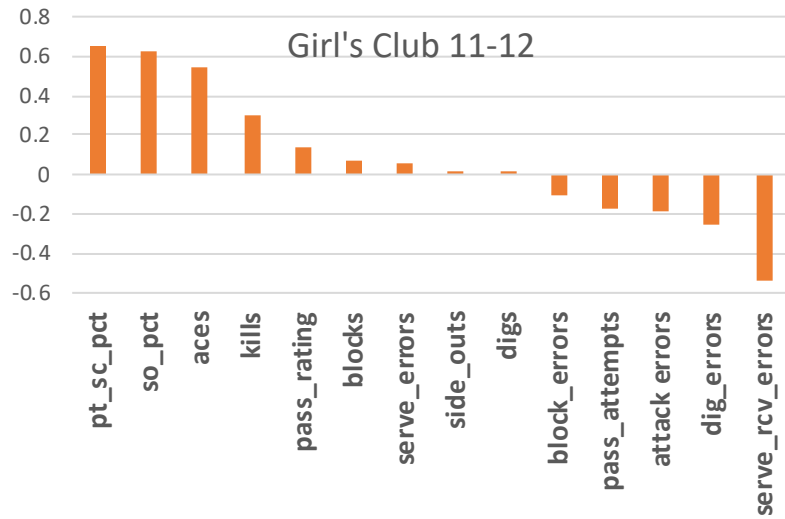
Stats vs Winning/Losing – Female
School Data

Girl's High School JV

Girl's High School Varsity

Women's Junior College

Women's Unversity
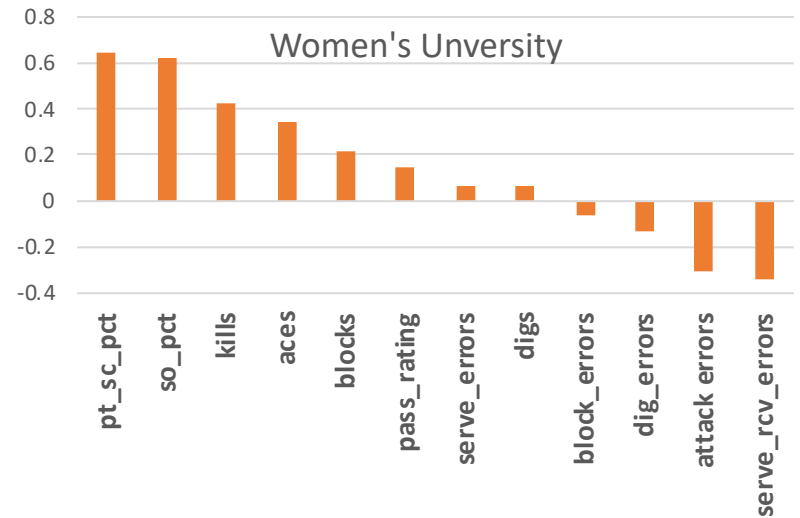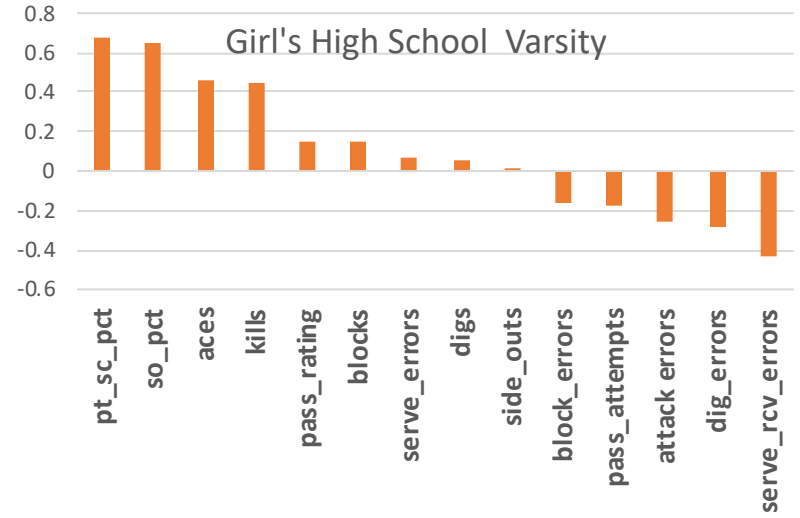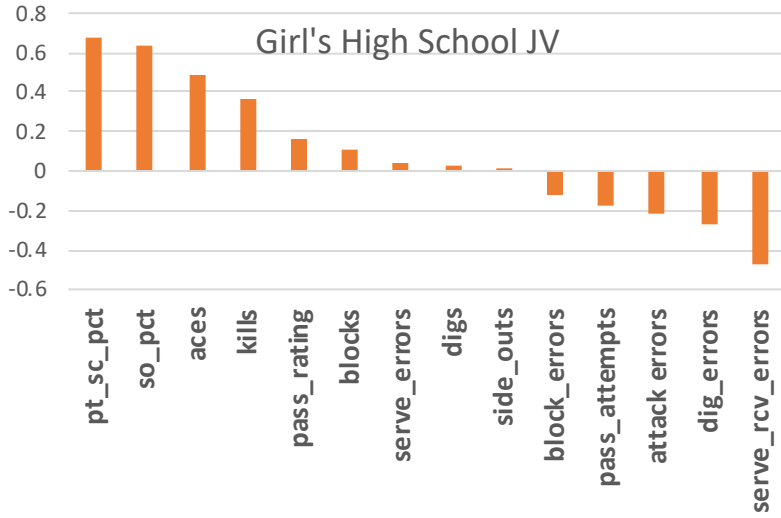
Stats vs Winning/Losing – Male
Club Data

Boy's Club 11-12

Boy's Club 13-14

Boy's Club 15-16

Boy's Club 17-18
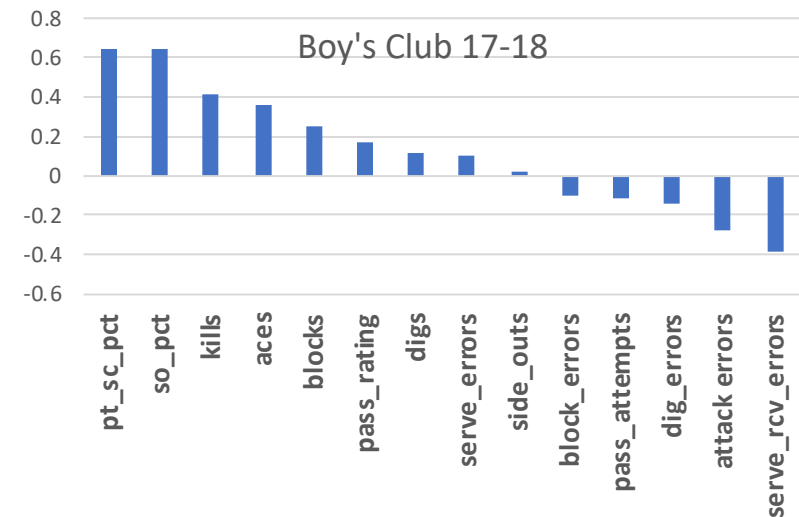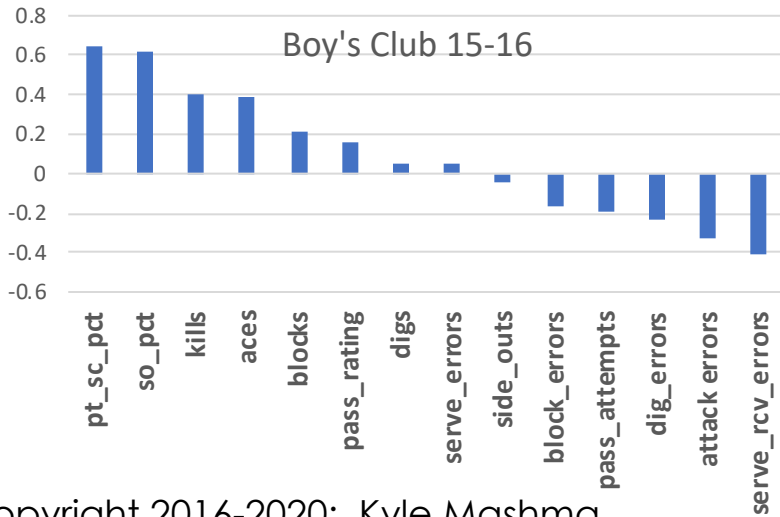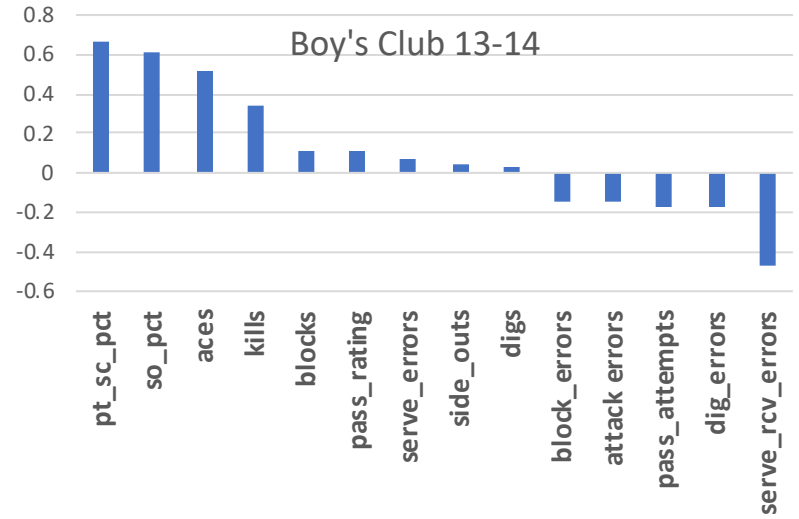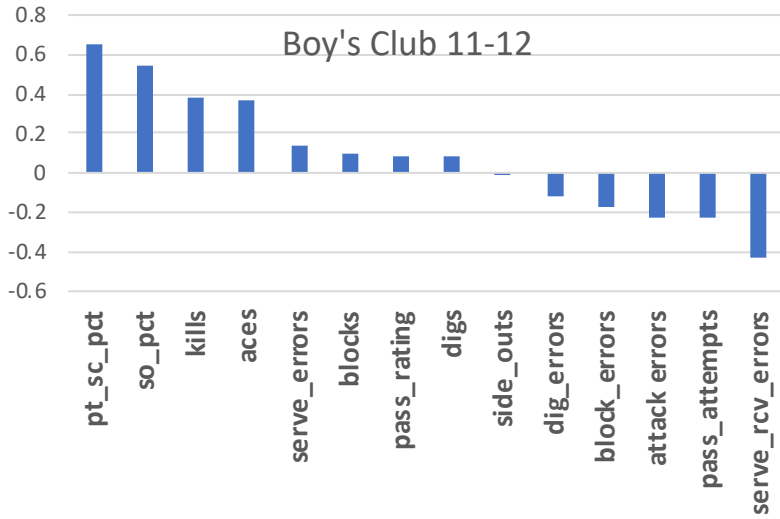
Stats vs Winning/Losing – Male
School Data

Boy's High School JV

Boy's High School Varsity

Men's Junior College

Men's University
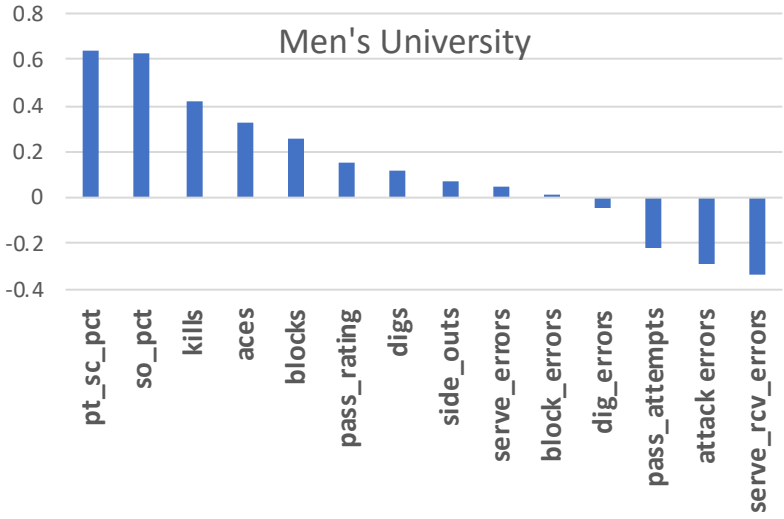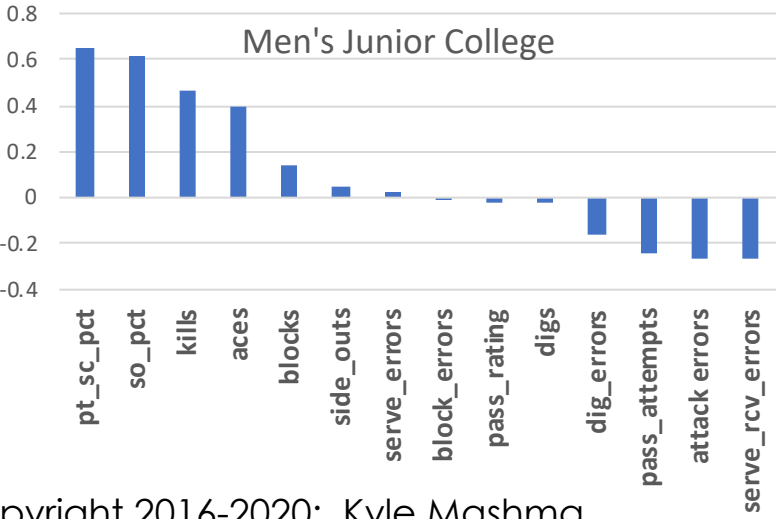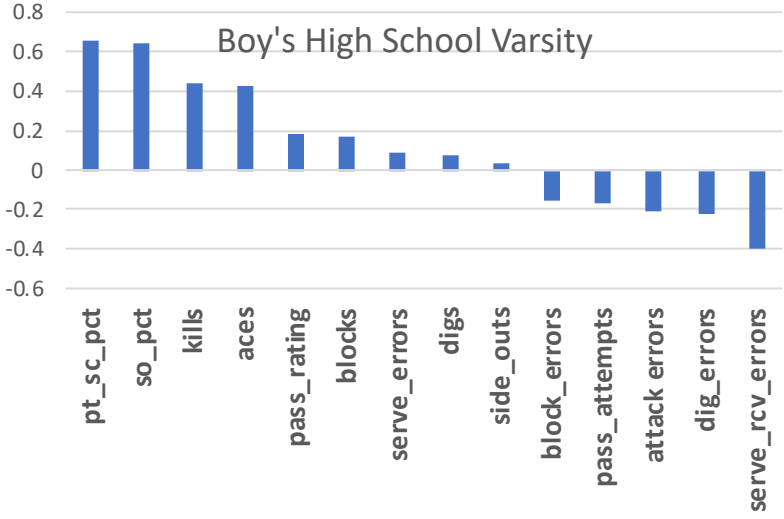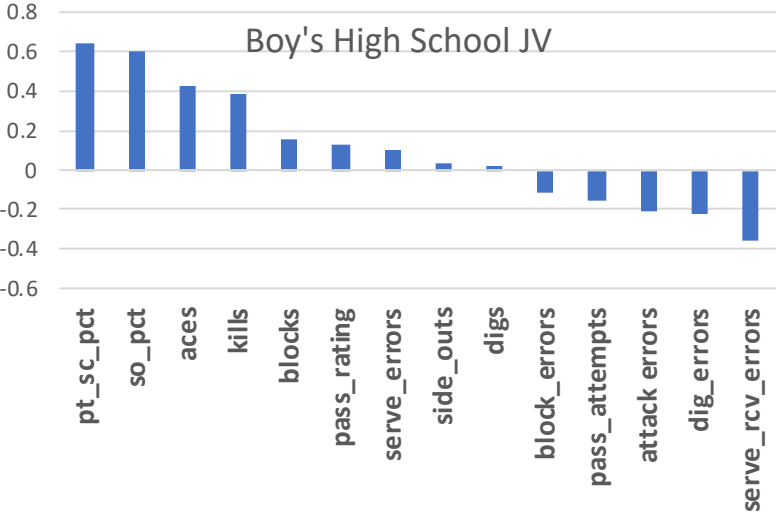
Comment on Overall Stats

- No surprise
  - Game moves from serves overpowering receivers to receivers getting stronger as the teams get older
  - Ace your way to a win at Club 12
  - Kill your way to a win at 18 and older

- Surprise
  - Low correlation to winning or losing for
    - Pass rating
    - Service Errors
    - Dig Success
  - These are indirect actions that don't lead immediately to a point – but still seems odd

General Coaching Thoughts

- Point Scoring – by Rotation
  - I don't do too much analysis here because the matchups have a lot of impact on results and it's hard to control
  - Focus mostly on Serve with best servers in early rotations
  - Work generally on holding the serve (good team defense)

- Side Out – by Rotation
  - Definitely look by Rotation because there's typically one or two "Pot Holes" – big point loser rotations
  - Good software will give you in-depth stats in each rotation and isolate specific errors

General Coaching Thoughts – continued

- Aces and Kills
  - At higher levels of play, the relationship between the action and the win rate is a high ratio. So one extra kill or ace might be 10-20% more wins

- Just because a stat is low correlation doesn't mean it's not important
  - Digs and Pass Ratings don't directly contribute to points
  - But they setup points
  - For Passing – focus on reducing Errors First before improving Accuracy (Rating Number)
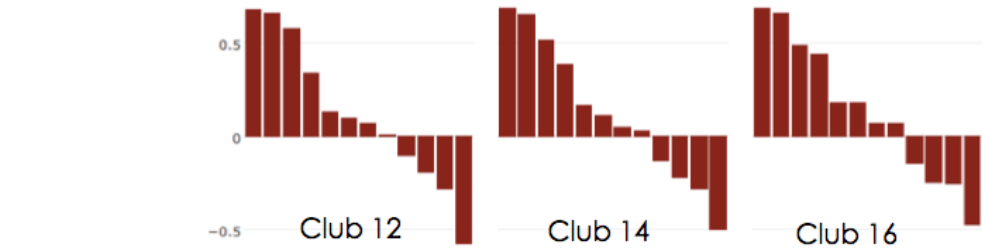
Key Stats by Level

Understand the Stats That Matter Most for YOUR Team

Key Stats by Level

- Show **7 Key Stats** that impact Winning most

- Find **Tipping Point** for each Key Stat
  - Typically one increment above (or below) the 50% win rate

- Show impact of crossing Tipping Point

- Provide possible coaching actions

Club 12– Key Stats

Priority	Key Stat	Tipping Point	Win %
1	Point Scoring %	60%	60%
2	Side Out %	50%	60%
3	Aces	6	65%
4	Kills	5	57%
5	Serve Rec Errors	6	38%
6	Dig Errors	5	43%
7	Attack Error	7	40%

Club 12 – Coaching Actions

- This is a Servie and Receive only, kind of game where there's not much in-rally play

- You need to work on a lot of serving and receiving and probably not that much else

- When serving, go for low error since opponent's side out capabilities are poor

- When receiving, forget quality, just get the ball up and avoid "duck and cover" volleyball

- Scrambling and saving balls is way more important than attacking for kills (it only takes 4 kills to be at 50% but probably very hard to achieve this)

Club 14 – Key Stats

Priority	Key Stat	Tipping Point	Win %
1	Point Scoring %	60%	55%
2	Side Out %	50%	60%
3	Aces	4	62%
4	Kills	6	57%
5	Serve Rec Errors	5	35%
6	Dig Errors	6	41%
7	Attack Error	8	38%

Club 14s – Coaching Actions

- At this level, the game is starting to look more like volleyball. Kill rates exceed Ace rates.

- You need to think about long term development vs winning today

- To improve Side Out, get Lower Rec Errors and Attack Errors
  - Go for every ball aggressively and get it up rather than getting a perfect pass
  - Set off the net, let hitters learn to hit well from off the net, and avoid hitting errors

Club 16 – Key Stats

Priority	Key Stat	Tipping Point	Win %
1	Point Scoring %	60%	75%
2	Side Out %	60%	85%
3	Aces	3	57%
4	Kills	8	57%
5	Serve Rec Errors	4	36%
6	Dig Errors	6	43%
7	Attack Error	7	41%

Club 16 – Coaching Actions

- This is an inflection point in the level of play where the game shifts from Acing to Killing for points

- Receive control is better for all teams

- More emphasis on setting and hitting but a lot of emphasis on doing this out of system

- Teach players to hit hard but over the net, long is ok while learning

- Learning to serve aggressively but consistently is always important

Club 18 – Key Stats

Priority	Key Stat	Tipping Point	Win %
1	Point Scoring %	50%	60%
2	Side Out %	60%	85%
3	Kills	9	56%
4	Aces	3	66%
5	Serve Rec Errors	3	41%
6	Attack Error	6	43%
7	Dig Errors	6	44%

Club 18 – Coaching Actions

- Now Kills correlate more to winning than Aces because it's hard to get an Ace since the Receive is better

- Systems will matter more to get an extra 1 or 2 kills. So receive and setting accuracy will be more important than before.

- Dig Errors – must practice aggressive defense to reduce dig errors

High School JV – Key Stats

Priority	Key Stat	Tipping Point	Win %
1	Point Scoring %	60%	70%
2	Side Out %	50%	60%
3	Aces	4	66%
4	Kills	7	59%
5	Serve Rec Errors	4	39%
6	Dig Errors	6	42%
7	Attack Error	7	43%

High School JV – Coaching Actions

- A blend of Club 14 and 16

- Same suggestions apply
  - This is an inflection point in the level of play where the game shifts from Acing to Killing for points
  - Receive control is better for all teams
  - More emphasis on setting and hitting but a lot of emphasis on doing this out of system

High School – Key Stats

Priority	Key Stat	Tipping Point	Win %
1	Point Scoring %	60%	80%
2	Side Out %	55%	60%
3	Kills	9	61%
4	Aces	3	63%
5	Serve Rec Errors	3	42%
6	Dig Errors	7	38%
7	Attack Error	7	39%

High School – Coaching Actions

- This is a blend of Club 16 and 18

- Point Scoring highly connected to serving – aggressive serving is key since serve errors have lower impact on losing vs aces to winning

- Side Outs & Receive Error + Kills tie together
  - Teach team to go after every serve and get the ball up vs make perfect passes
  - Attack smart, avoid errors

- Dig Errors – must practice aggressive defense

Junior College – Key Stats

Priority	Key Stat	Tipping Point	Win %
1	Side Out %	60%	70%
2	Point Scoring %	50%	70%
3	Kills	11	64%
4	Aces	3	66%
5	Serve Rec Errors	2	46%
6	Attack Error	6	38%
7	DIG ERRORS	5	41%

Junior College – Coaching Actions

- Continue to work on receive and serve

- Develop more sophisticated attack and blocking

- Still need to focus on out of system play

University – Key Stats

Priority	Key Stat	Tipping Point	Win %
1	Point Scoring %	50%	60%
2	Side Out %	60%	70%
3	Kills	11	57%
4	Aces	2	61%
5	Serve Rec Errors	2	45%
6	Attack Error	6	38%
7	Dig Errors	7	42%

University – Coaching Actions

- Aces count is lowest here
  - but serve aggressively to force out of system play – watch where the received pass goes – if it doesn't break the 10ft line then you have eliminated their middle attack

- Must control receive and attack for efficient kills

- Out of system attacking skill are critical for staying in the game

Conclusions

Conclusions

- The key skill stats for all levels of play are:

  1. Serve
  2. Receive
  3. Kills
  4. Attack Errors
  5. Dig Errors

- At all levels of play, serve and receive are critical skills however, the way you score points changes
  - Youth play – is win by Aces
  - Older play – is win by Kills

Questions?

- Contact
  - Kyle@rotate123.com