



NBA Team 2

MEASURING ASSIST QUALITY IN THE NBA



INTRODUCTION

- **Goal:** Reveal the true value of assists
- **Focused:** 2024-2025 NBA season
- **Data Sources:** PBP Stats API
 - >200,000 total shots
 - ~65,000 assists
- **Logics:**
 - Build an Assist Quality Rating
 - Rank Players and Assists
 - Visualize Findings
 - Other adjustments and factors



EQUATION

AQR = CreationBoost * ShooterSkill * DefenseFactor * ClutchFactor * DistanceFactor

- **Creation Boost:** Measures how good the generated shot quality was relative to the league baseline for that zone

$$0.5 + 0.5 \times \left(\frac{\text{shot_quality}}{\text{league_avg_shot_quality}(\text{zone})} \right)$$

- Caps at 1.25 to prevent inflated values
- Zones =
 - {AtRim, ShortMidRange, LongMidRange, Arc3, Corner3}

EQUATION

$$\text{AQR} = \text{CreationBoost} * \text{ShooterSkill} * \text{DefenseFactor} * \text{ClutchFactor} * \text{DistanceFactor}$$

- **Shooter Skill:** Captures how good the receiving shooter is in that shot zone:
 - Uses player's historical shooting % by zone
 - Bayesian-smoothed with league priors to stabilize low samples
 - Shooters with strong zone accuracy → boost AQR
- **Defense Factor:** Adjusts assist value based on opponent defensive strength
 - Uses opponent relative defensive rating
 - Stronger defense → higher multiplier
 - Helps reward passes that create shots vs elite defensive teams

EQUATION

$$\text{AQR} = \text{CreationBoost} * \text{ShooterSkill} * \text{DefenseFactor} * \text{ClutchFactor} * \text{DistanceFactor}$$

- **Clutch Factor:** Adds value for assists during high-pressure, late-game moments
 - Final Quarter
 - Time & score-based tiers (up to 1.20× boost)
 - Shots created in clutch moments are worth more
- **Distance Factor:** Encourages value for creating shots that are inherently difficult due to distance
 - At rim / midrange → slight reduction (0.97–0.99)
 - 3-pointers → no penalty (1.00)
 - Rewards creating spacing for more valuable shots (3s)

VIDEO TIME



Top 10 by AQR (with usage):					
Player	Team	AQR	Usage	Assists	

Darius Garland	CLE	61.3	27.0%	503	
Ja Morant	MEM	58.3	31.9%	363	
Donovan Mitchell	CLE	56.8	30.8%	359	
Damian Lillard	MIL	56.5	27.5%	417	
James Harden	LAC	55.4	29.2%	698	
Jalen Williams	OKC	55.1	27.5%	341	
Jaylen Brown	BOS	55.0	28.7%	286	
Luka Dončić	LAL	55.0	33.4%	385	
Caris LeVert	CLE	54.8	19.5%	216	
Giannis Antetokounmpo	MIL	54.8	35.3%	436	

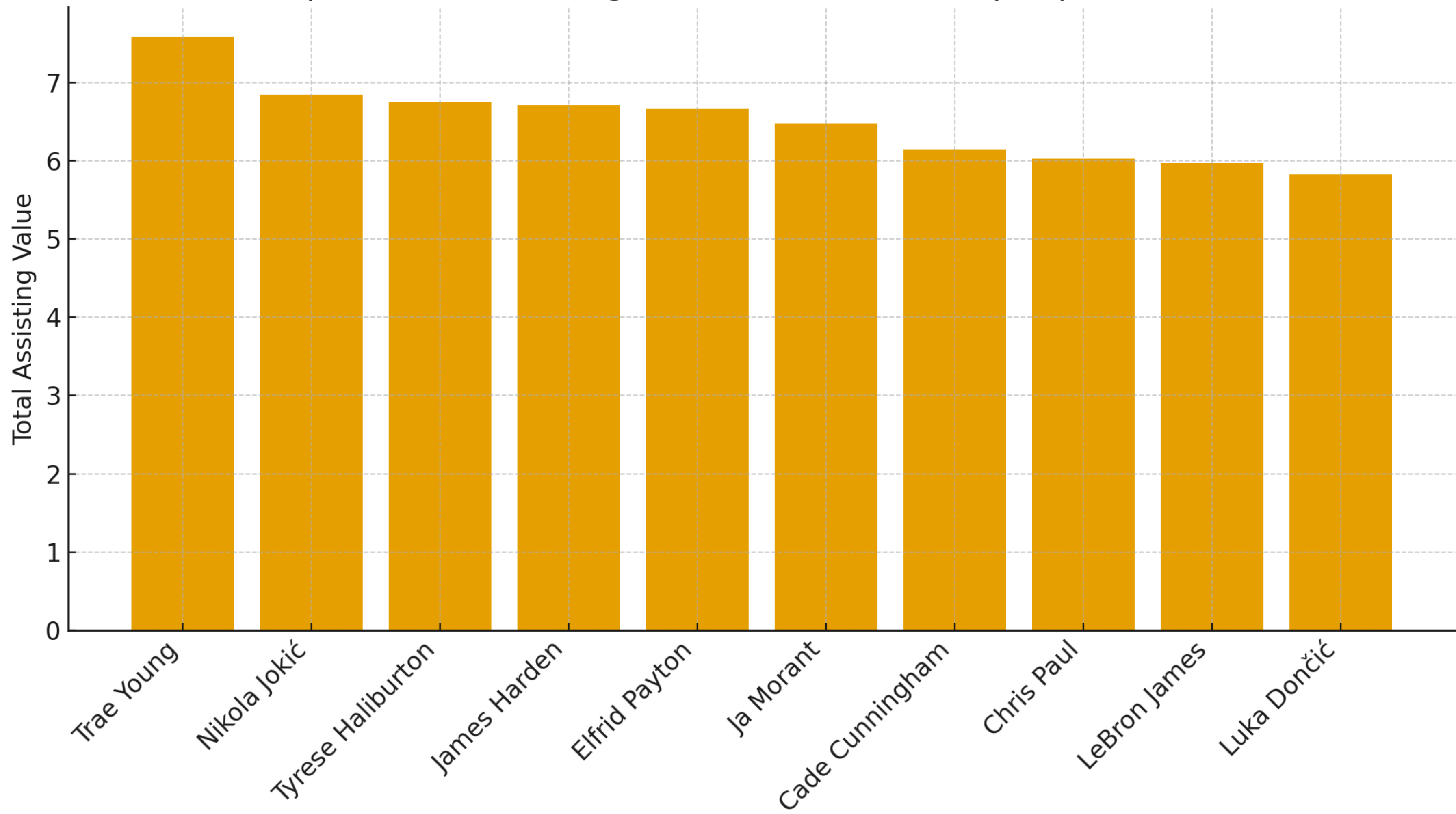
Notable Players not in top 10:

- #19 LeBron James (AQR: 52.1)
- #23 Nikola Jokic (AQR: 51.9)
- #28 Tyrese Haliburton (AQR: 51)
- #33 Trae Young (AQR: 50.7)

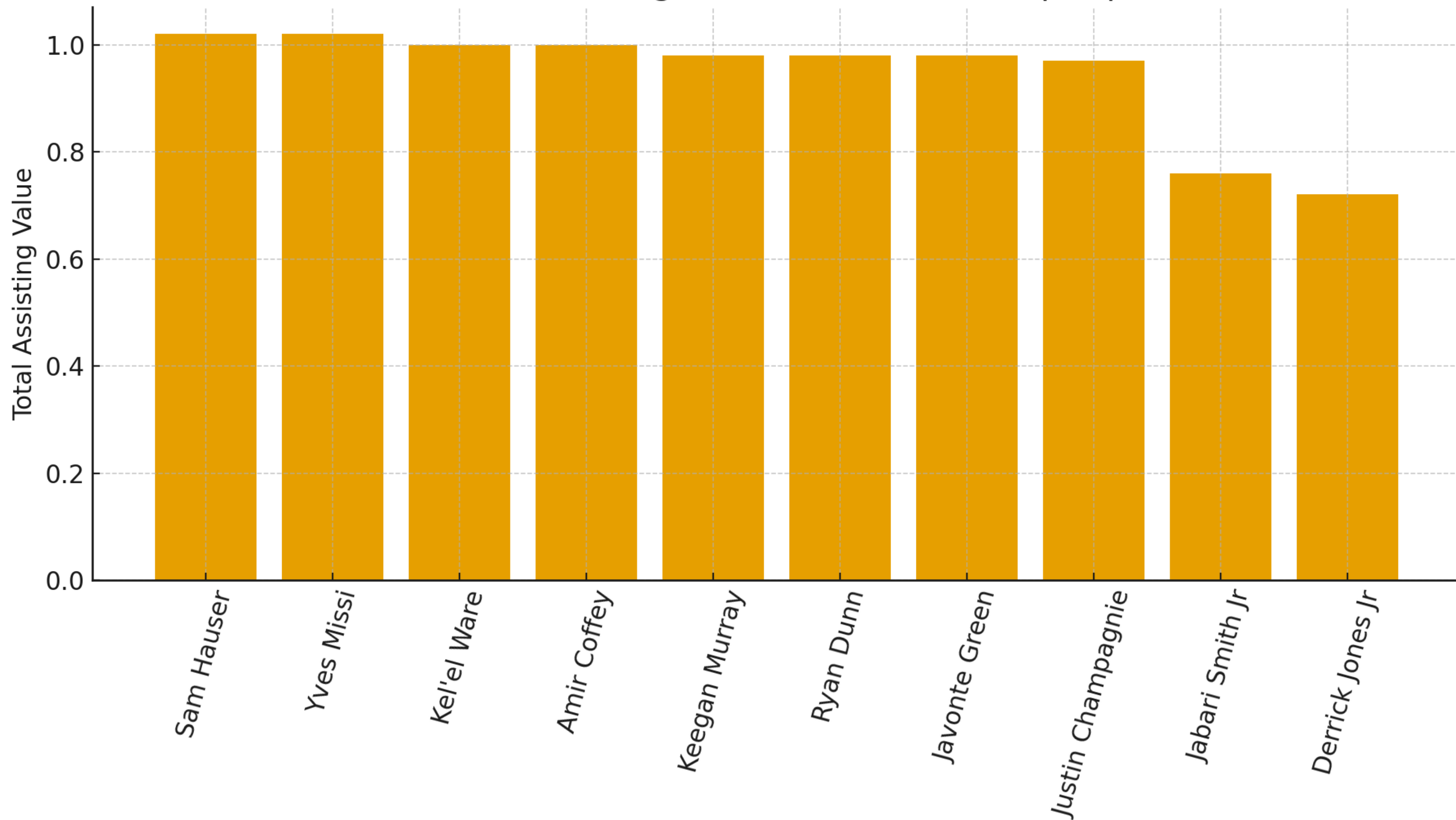
Notable Players in top 20:

- #11 Max Strus (AQR: 54.5)
- #14 Taurean Prince (AQR: 53.2)
- #17 Ty Jerome (AQR: 52.6)
- #18 Naji Marshall (AQR: 52.3)

Top 10 Total Assisting Value (AQR × assists per possession)

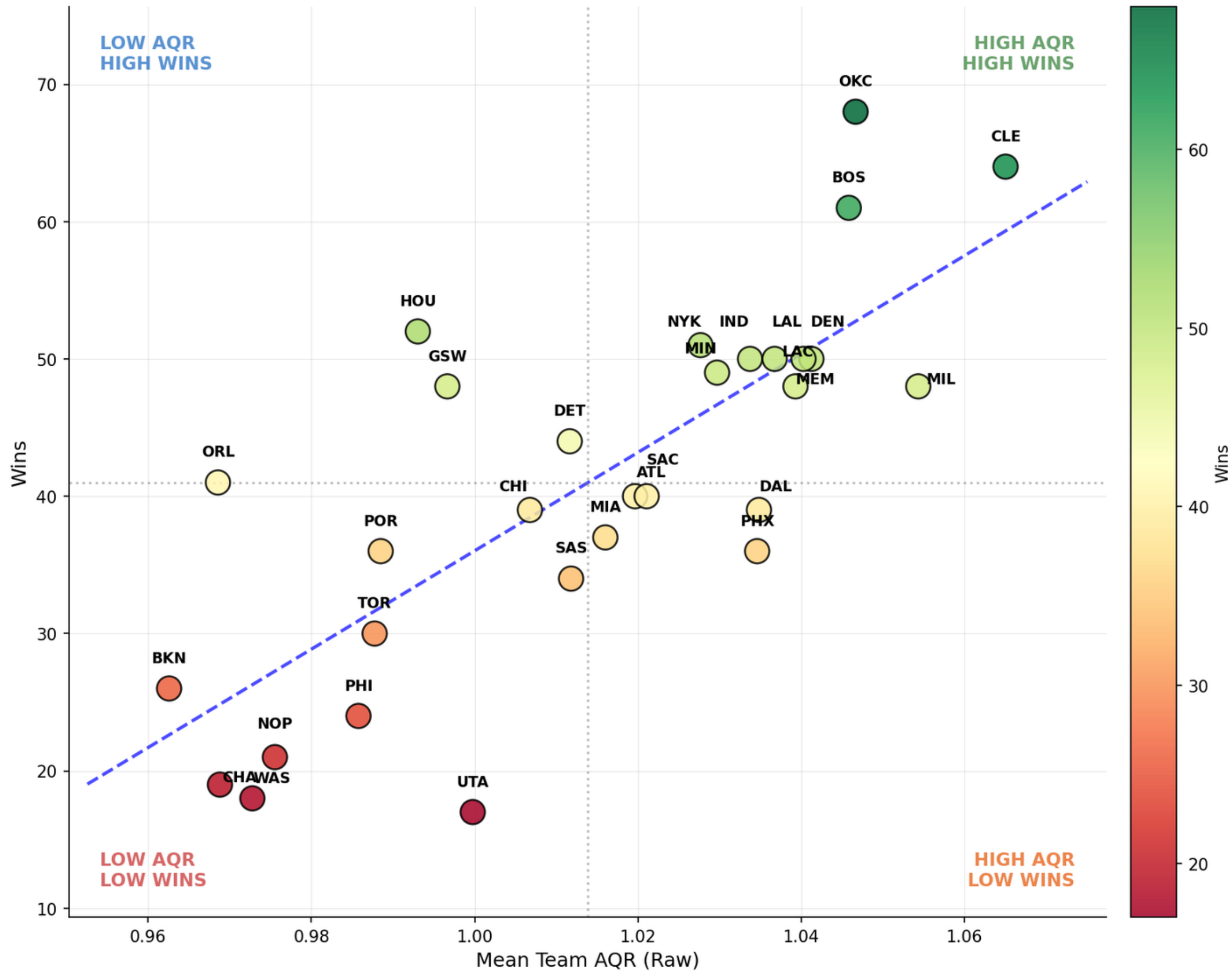


Bottom 10 Total Assisting Value (AQR × assists per possession)

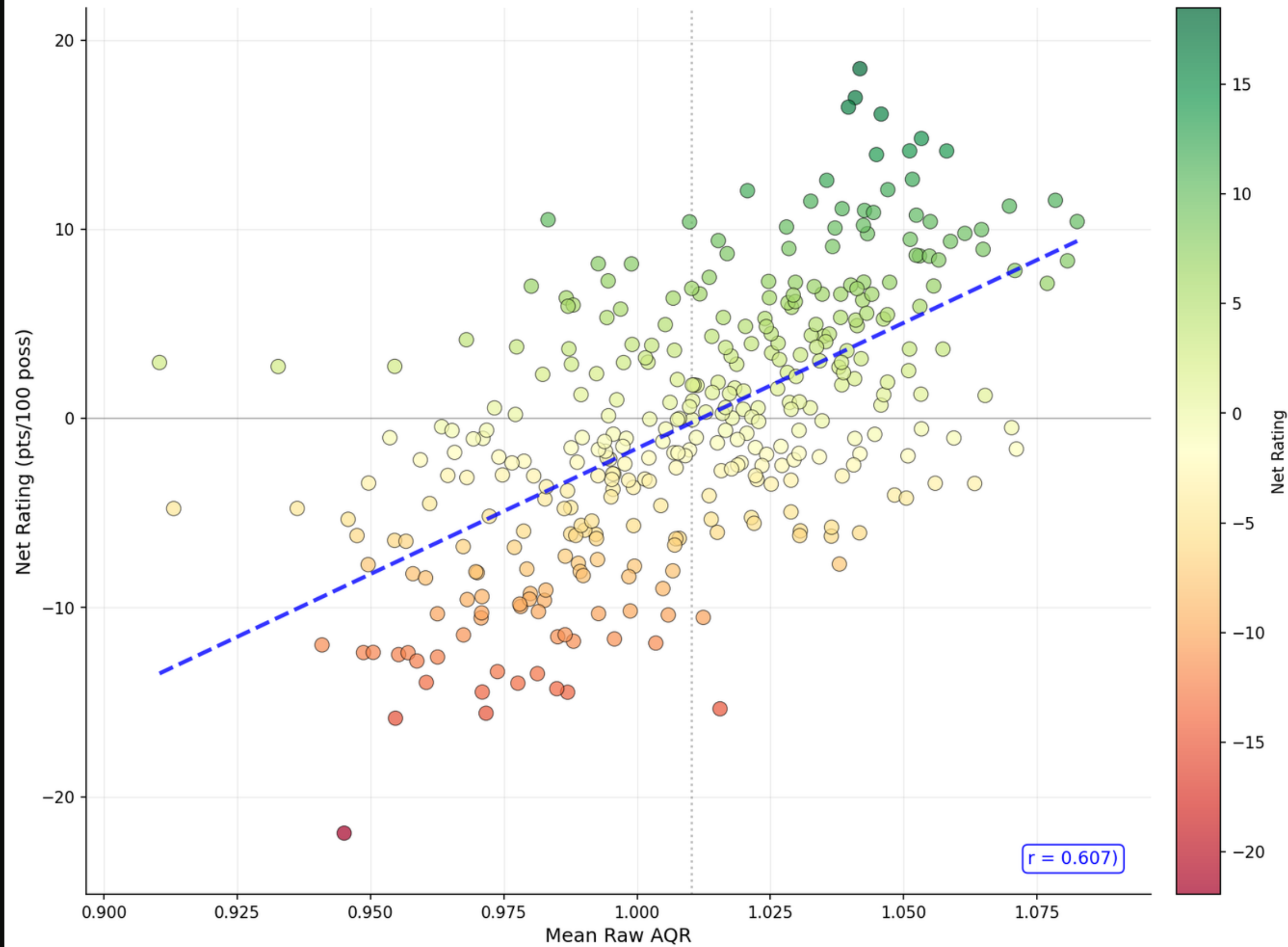


Trend Line: $r = 0.767$

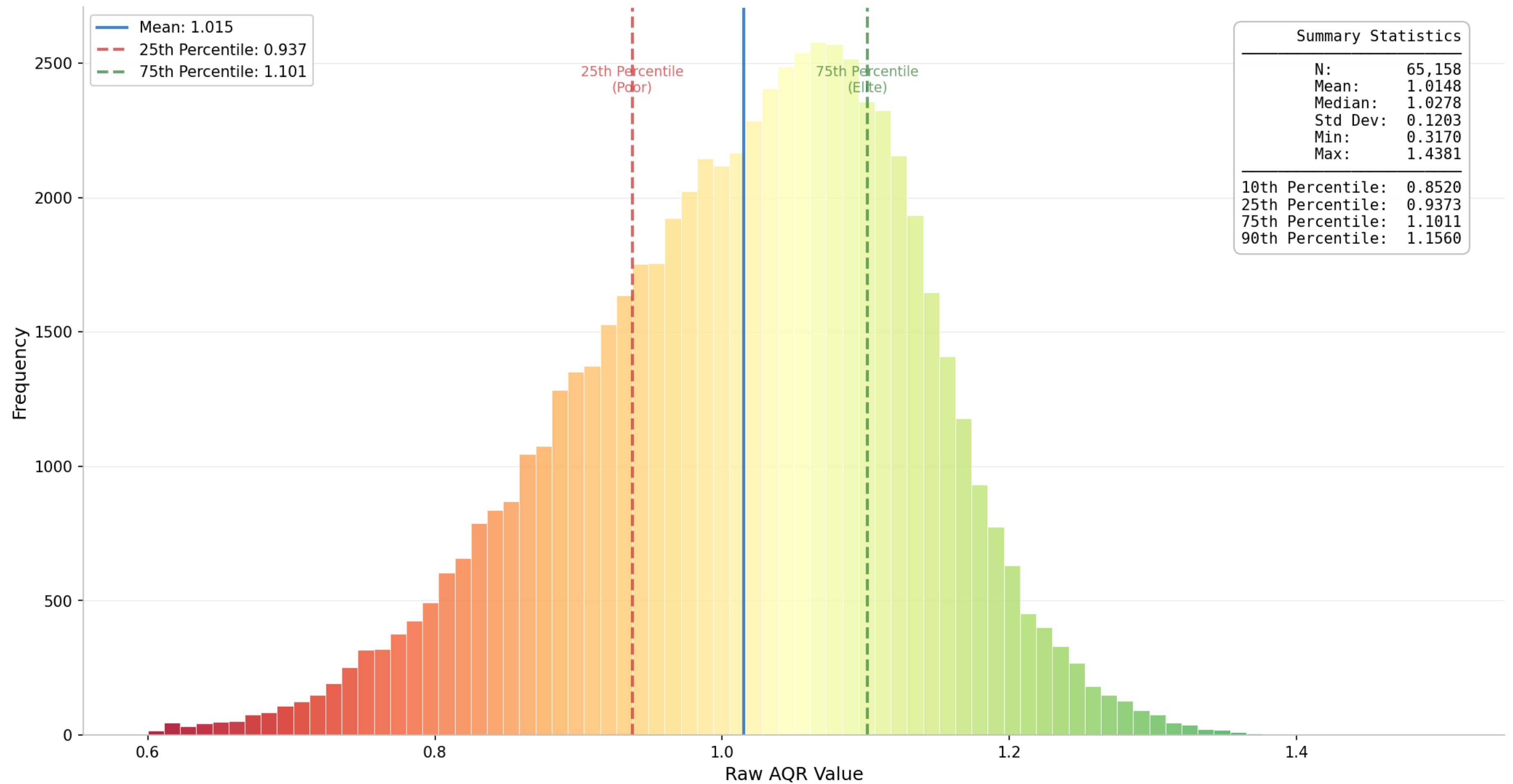
Team Assist Quality vs Wins 2024-25 Season



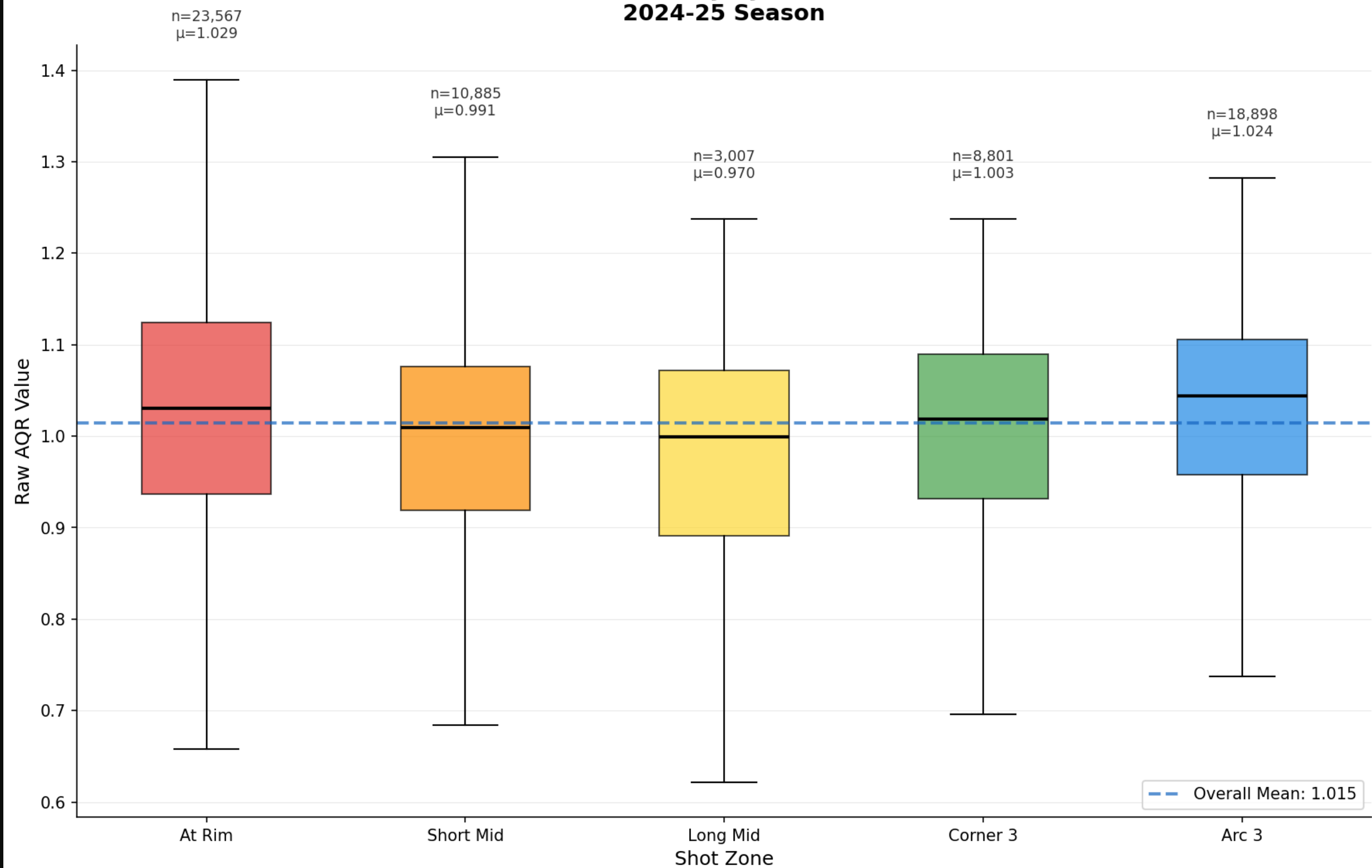
Player Assist Quality vs On-Court Impact
2024-25 Season (min 50 assists)



Distribution of Assist Quality Ratings (AQR)
2024-25 Season — 65,158 Total Assists



Assist Quality by Shot Zone
2024-25 Season



CHALLENGES & LIMITATIONS



Deciding factors

Some variables we wanted to track isn't easily accessible (eg. pass distance, nearest defenders, etc.) so not really 1 to 1 proxy for creation ability



Finding the data



NBA API rate limiting → PBP Stats API

FUTURE PLANS

- **Considering more factors**
 - e.g., Nearest Defender Distance, Pass Distance
- **Application of the algorithm**
 - Identify undervalued passers
 - Adjust lineups to optimize best quality looks
 - Diagnose offensive inefficiencies





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THANK YOU

