Evaluating the Impact of Contextual Factors on Shot Success in Basketball

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Purpose

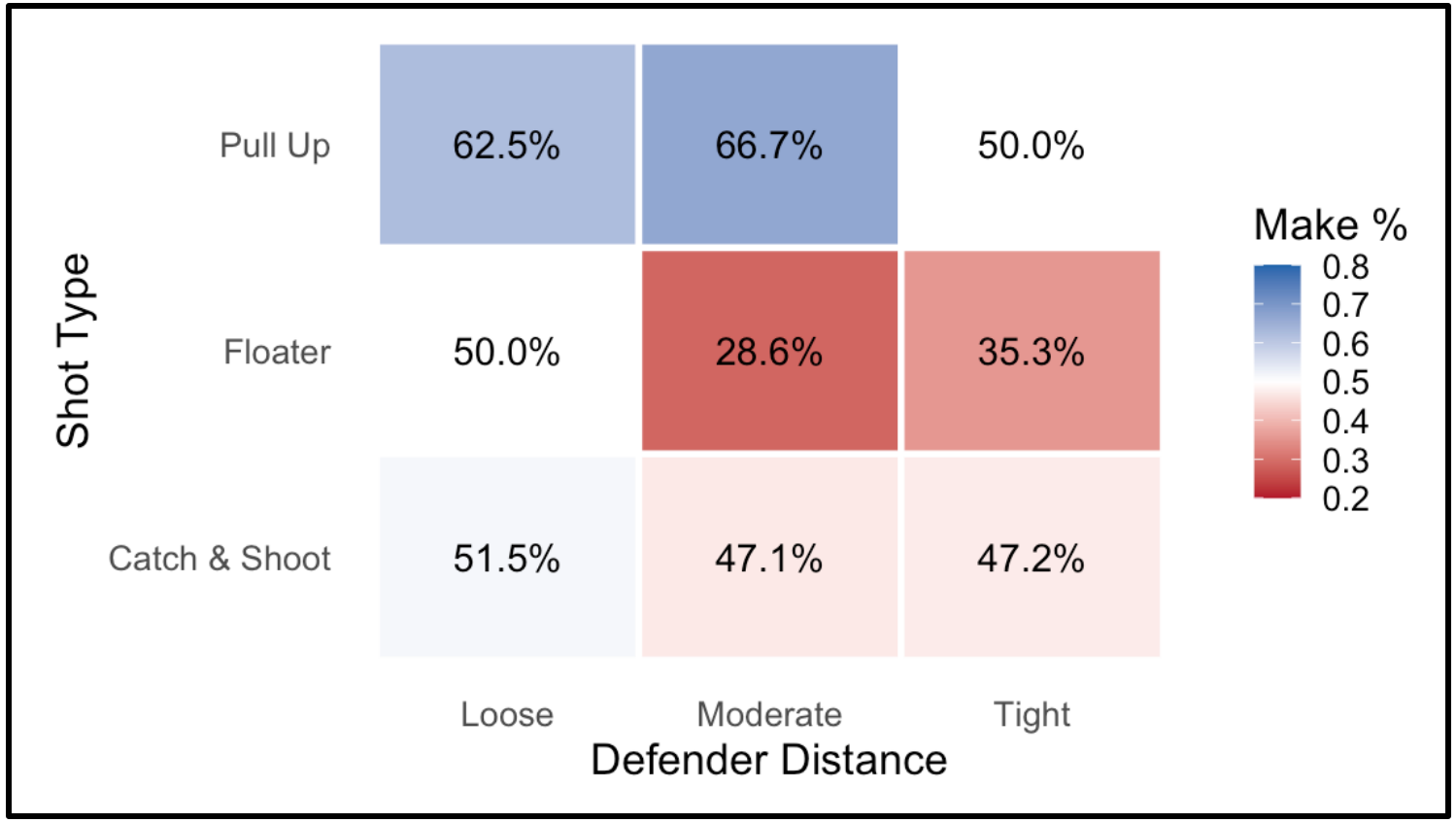
GOAL: EXAMINE HOW DEFENSIVE PRESSURES AFFECT SHOT SUCCESS AND IDENTIFY AFFECTIVE STRATEGIES

HYPOTHESES: DEFENDER DISTANCE & HAND POSITION MOST INFLUENCE SHOT OUTCOME

Data Collection

- Observed 5 NBA games
- Manually recorded each shot using shared criteria
- Collected:
  - Shot type: Floater, Pull-Up, and Catch & Shoot
  - Defender distance: Loose, Moderate, and Tight
  - Hand up/down: 0/1
  - Shot outcome: Make/Miss
- Total shots: 253

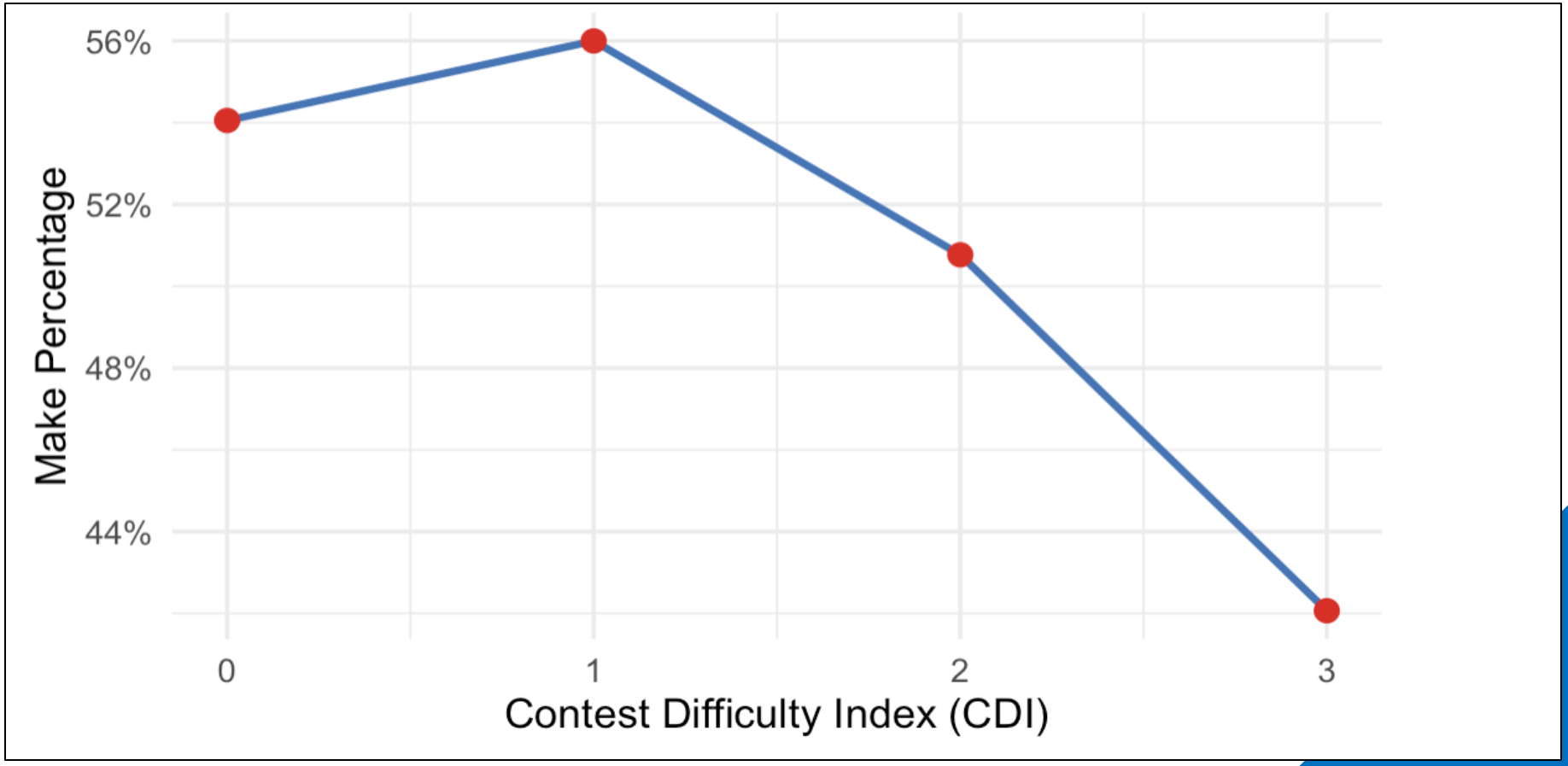
How Shot Types Respond to Defensive Pressure



Contest Difficulty Index (CDI)

Contest Difficulty Index = **Hand** + **Defender Distance**

Shot Success by Contest Difficulty (CDI)



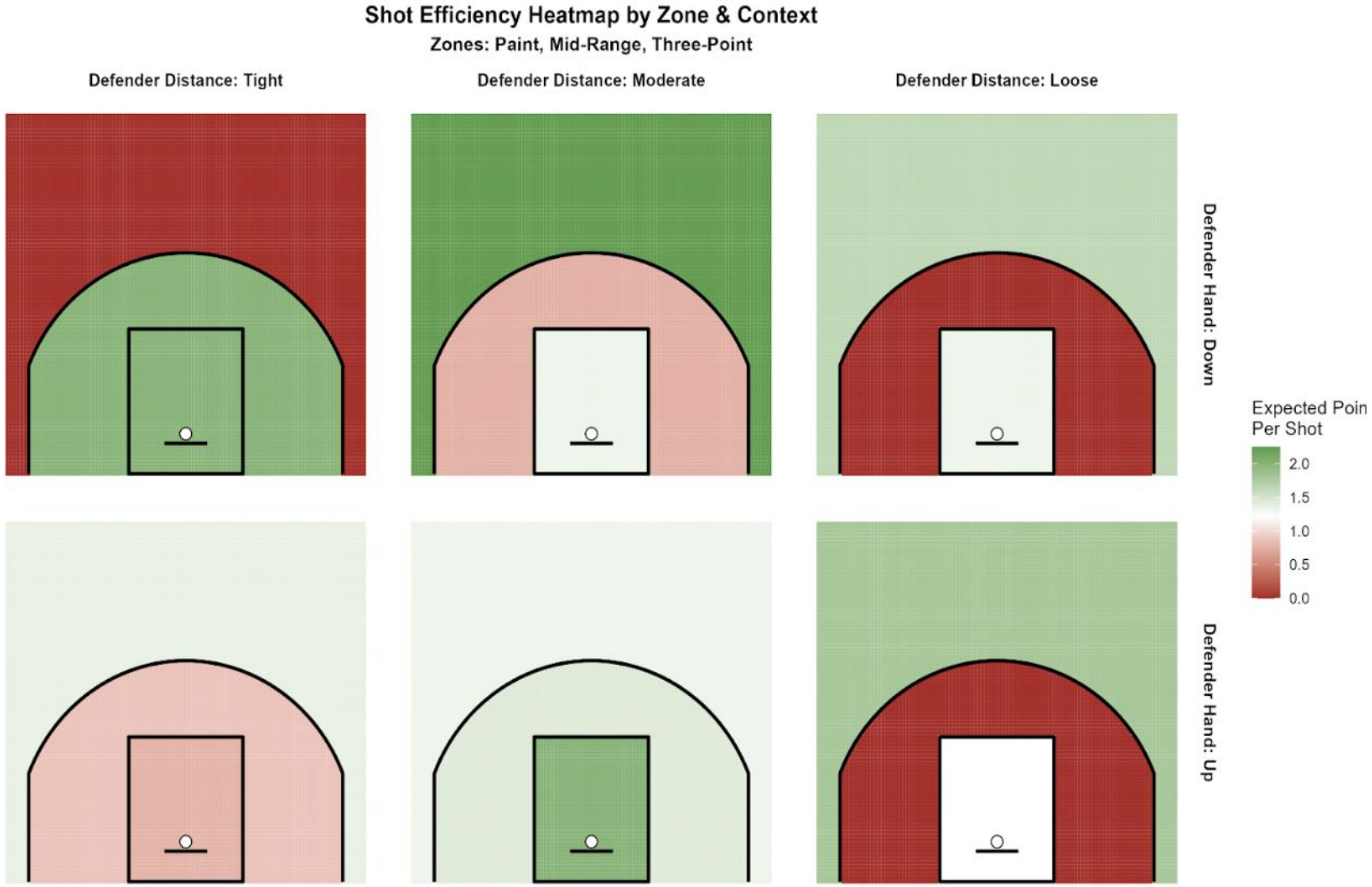
Shot Value Across Locations (EPPS)

- Needed to evaluate shot value, not just shot success
- Created a metric to evaluate the expected value of specific shots

$$Expected\ Points\ per\ Shot = \frac{Total\ Points\ Scored\ in\ the\ Group}{Total\ Shots}$$

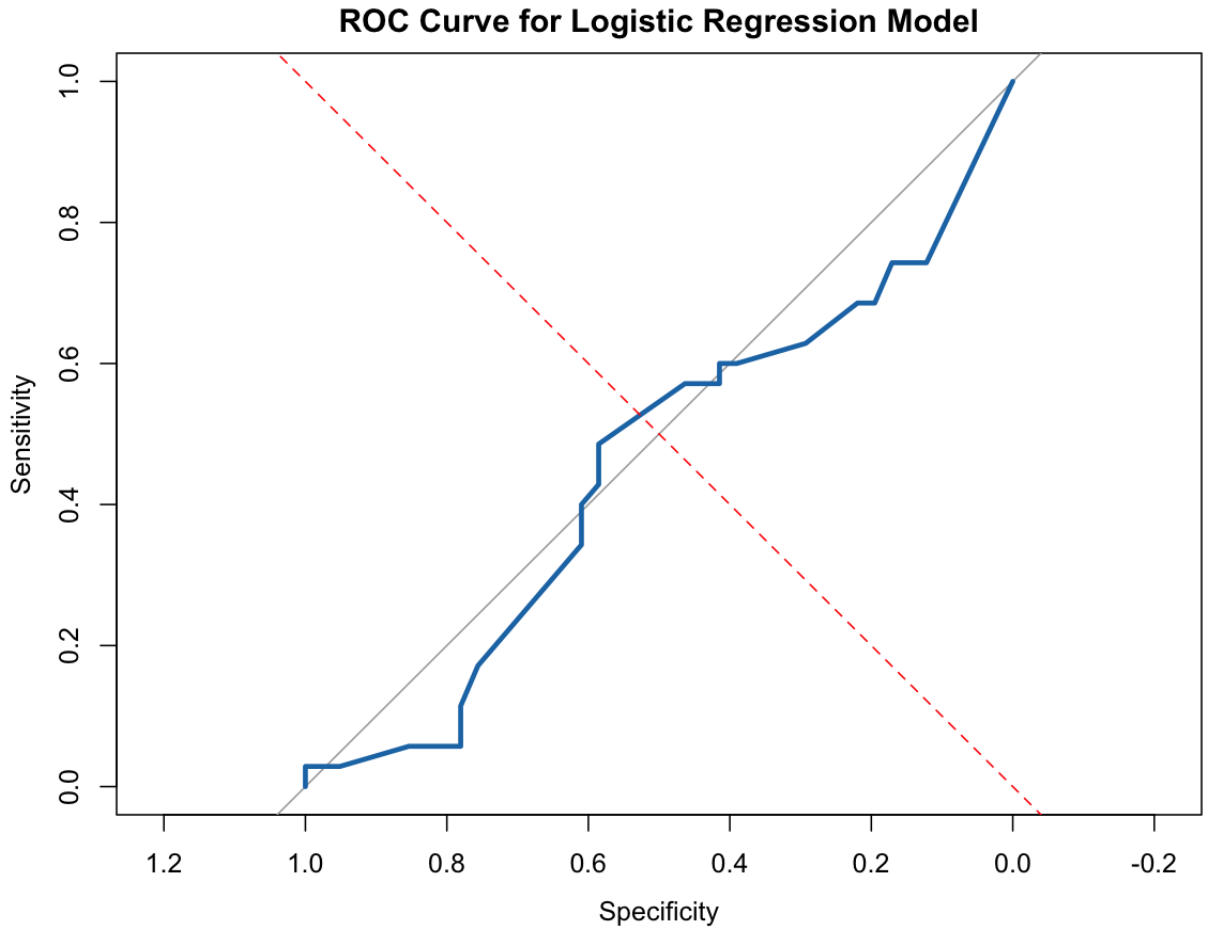
Location	Attempts	Makes	Field Goal Percentage	Expected Points per Shot
Paint	62	22	0.452	0.903
Mid	48	28	0.458	0.917
Three	143	70	0.49	1.47

Shot Value Based on Defense

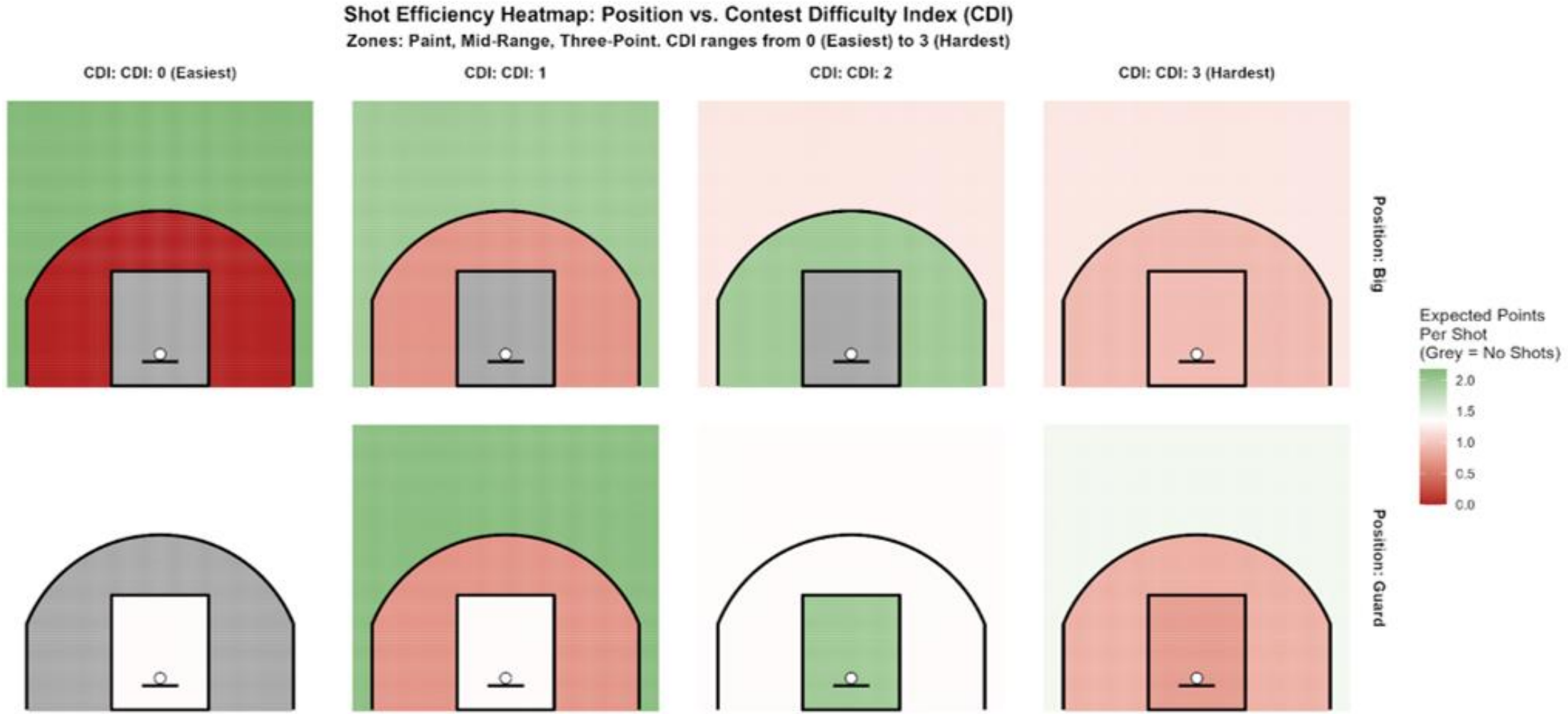


Predicting Shot Outcome

- Logistic Regression
- All our variables as is
- 48.7% accuracy
- No significant variables



Shot Value Across CDI and Player Position



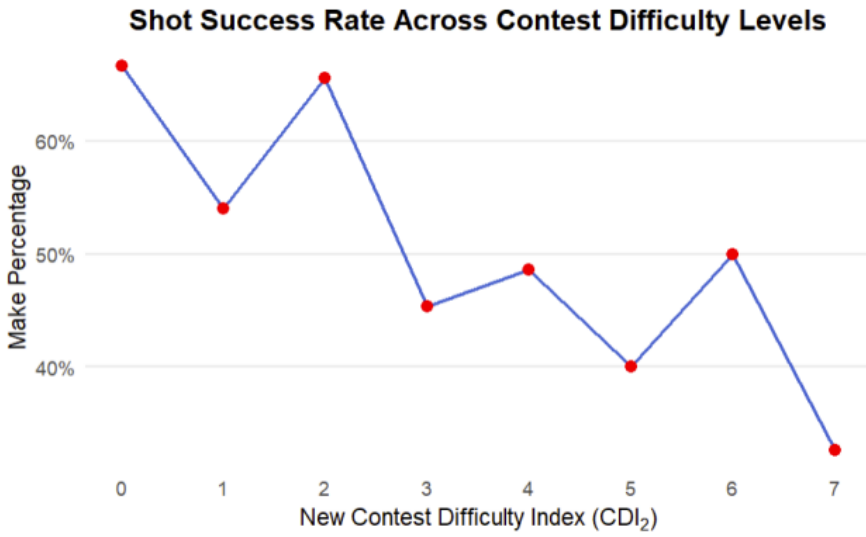
CDI_2: Better Measure of Contest Quality

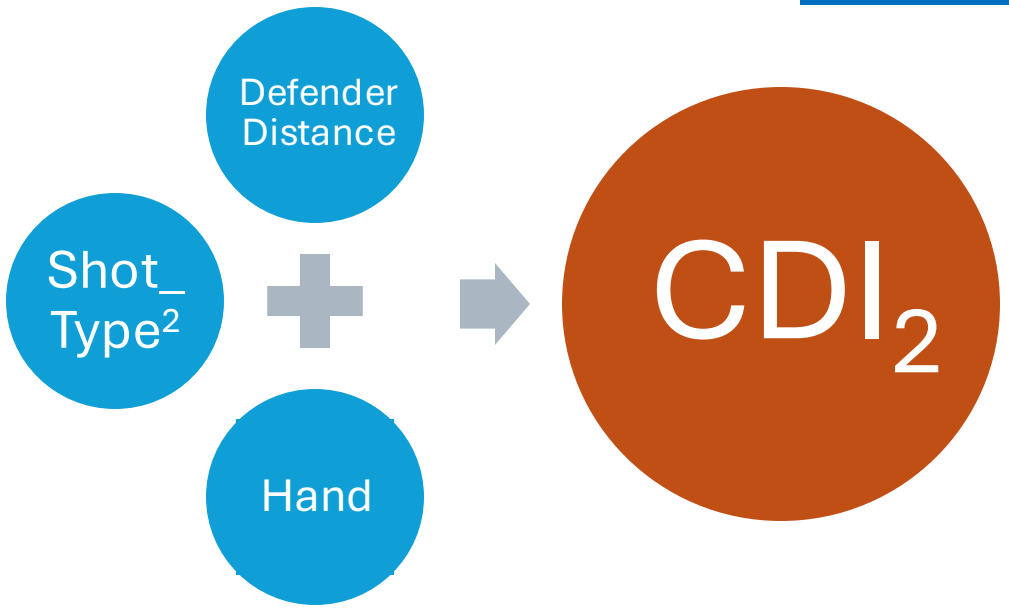
Continues the same trend as the previous CDI, but now ranges from 0 to 7

Follows the success rate of the type of shots completed

Captures non-linear jump in shot difficulty from pull-ups → floaters

Becomes a statistically significant predictor of Makes. p=.009 <.01





Next Steps & Future Improvements

IMPROVE DATA QUALITY

ADD MISSING GAME CONTEXT

STRENGTHEN MODELING APPROACH

Thank You!