

1125-I5-249

James R Henderson* (jrh66@psu.edu). *Maximizing Utility of Challenges in Professional Tennis.*

It is well documented that most incorrect line calls in tennis are made on balls landing on or inside the lines but which are nevertheless called "out." This means that of the calls players want to challenge, most are made at the far end of the court. Unfortunately, there are several reasons that it is much more difficult to see the impact points of balls landing tens of yards away than those bouncing nearby. Thus, given that players want to challenge all and only (disadvantageously) incorrect calls, they are pulled in two directions: the potential for lineperson error leads players to challenge calls made on the far side of the court, and the potential for player error (with respect to linesperson error) leads players to challenge calls on the near side of the court. Further, speed of shot, direction of shot (with respect to the line it approaches), lighting conditions, and a variety of other factors make shots easier or more difficult to call correctly. How might players maximize the utility of their challenges? IBM and tournaments own (and do not generally release) Hawkeye challenge data, so figures have been independently collected from recorded matches to study this question. (Received August 18, 2016)