

Upsetting, sure – but surprising?

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March 23, 2004

NCAA tournament upsets are of great interest both to fans and to the sports media that cater to them. Fans often enjoy rooting for David over Goliath (unless of course you grew up in Goliath's home state or attended his university), and "Cinderella" teams give sportswriters great story angles for the long dry period between when the Round 2 or 4 games end on Sunday and when the next games begin the following weekend. Most importantly from a modern fan's perspective, upsets encourage participation in office pools because they add to the overall uncertainty as to the ultimate winner, and thus make it feel more like a lottery (where winning is purely a matter of luck) than a poker game (where luck matters but skilled players have a decided edge). When favorites go down, it's often the guys who thought they were playing it safe and smart that start tearing up their pool sheets, while many participants who made their picks based on the color of the teams' uniforms keep smiling. Indeed, I myself am currently luxuriating in a five-way tie for 129th place out of 138 participants in an office pool; thank you Nevada, Xavier, Alabama, and, of course, UAB.

So upsets can be upsetting, but are they really surprising? One can easily look to history, and the possibly surprising answer is that they should not be. In the 19 complete years (1985–2003) since the NCAA men's tournament became a 64-team affair, #1 seeds are 66-10 in second round games, a winning percentage of 87%. This year in the same situation, #1 seeds went just 2-2 (50%); worse than what we might have expected, but not breathtakingly so. A statistician would probably say this year's Round 2 results are not "significantly different" from those seen in the past; indeed, the data suggest we would *expect* almost one of every six #1 seeds in this situation to get beat.

The numbers for #2 seeds are even more telling: their 19-year Round 2 record is just 49-23 (68%); we expect about one of every three #2 seeds to bow out in Round 2. And while no #1 seed has yet vanished in Round 1, 5% of the #2 seeds have (anybody remember Hampton over Iowa State a few years ago?). So again, the fact that half of the #2's lost in Round 2 this year is a little worse than usual, but hardly shocking.

Probabilistic reasoning bears this out. Statisticians often use point spreads (of the sort offered by casinos or sports bookmaking operations) to infer the probability that a favorite will defeat an underdog. While some may find this use of gambling-related information distasteful, point spreads' connection to wagering is precisely what gives them their value as predictive tools: the betting public as a whole is well-informed regarding the teams, their records, current injuries, and so on, and the point spread is the result of wagers putting their money where their brains are. More specifically, the outcomes of the games turn out to be centered around the point spread (the favorite "covers the spread" roughly half the time), and arranged in the shape of a normal distribution, the familiar "bell curve." Given a measure of how wide this bell curve is (what statisticians call the standard deviation), one can then easily derive a team's expected win probability for any matchup.

Applying this thinking to the most talked-about recent upset, #9 UAB over #1 (and #1 overall seed) Kentucky in the St. Louis bracket, is illustrative. Kentucky was favored by 10 points; this converts into a win probability of 82%, or a little less than $5/6$. While it would have taken nerves of steel to predict such an upset, in hindsight it is not so startling. UAB essentially needed to "roll a six" to beat Kentucky, and in probabilistic terms this is precisely what happened: the underdog played better than it ever had, and made a clutch shot with time winding down; the favorite by contrast played beneath its usual level, missed a tip-in at the buzzer, and another thrilling upset victory was sealed.

What's more, Kentucky's 10-point predicted advantage equalled the largest of any of those

assigned to the #1 seeds in Round 2 (Duke favored by 10, 82% win probability; Stanford 7, 74%; St. Joseph's 6.5, 72%). All of these win probabilities are smaller than the aforementioned overall historical 87% win percentage of #1 seeds in Round 2 games. This provides further support for the case that a higher state of "parity" currently exists among college basketball programs, a recent subject of substantial interest among coaches, fans, and sportswriters. But it also suggests the enormity of the task faced by fans when filling out their office pool brackets every March, and the unfathomable odds against winning the large cash prizes offered by some websites for picking all 63 games correctly (you'd be more likely to be hit by lightning on your way to the championship game).

Upsets happen; you just don't want to be there when they do. But whether you are or not is largely a matter of luck. Next year I'm going back to picking the teams with the blue shorts.

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