

20/19

A very warm welcome to my first Uniblog of 2019! For this one I've interrupted my numbered series on dart flight dynamics (don't cheer too loudly – number 6 is waiting in the wings!), partly to congratulate MvG on his well-deserved PDC victory (good effort Bully Boy, though) as well as Glen "Duzza" Durrant on an impressive third BDO World title in a row and "Miracle" Mikuru Suzuki and 13-year-old Leighton Bennett on what may be the first of many for them. Well done to all!

Mostly, though, I'm going off-piste since the advent of 2019 presents an irresistible opportunity to look again at a question I have mentioned briefly before, whether treble 19 could have advantages over treble 20 as the main aim point for scoring.

Using the standard statistical concept of a "normal" distribution, it can be shown that, assuming equal accuracy at either target, a T20 aimpoint yields higher scores than T19 for players with a 3-dart scoring average above about 60. For we less accurate folk, the adjacent numbers to 19, 7 & 3, being greater than the 20 equivalents, 5 & 1, actually makes aiming at treble 19 slightly more productive.

So far so good. However, even with the equal accuracy assumption, for top players with a scoring average around 100, the 7&3 v 5&1 factor means that the actual numerical advantage of aiming at 20s is not huge, around 4 per 3 dart go.

Now for the main discussion point of this blog. Is that equal accuracy assumption valid? Theory indicates maybe not as, for an average height player releasing their darts around bull level (5'8" or 1.73m), the assistance of gravity at the lower target means the time of flight is less by around 3% for a typical throw speed.

That means 3% less time for any unwanted lateral velocity imparted at release to act. Although the verticality of 20s compared to the tilt of 19s may be a counter factor, at least psychologically, aiming at 19s may also have an advantage in that the trajectory will be flatter, more directly along the player's line of sight

Shorter players might obviously gain even more advantage from aiming at T19 as the time of flight difference from a T20 target when a dart is released from a height of, say, 5' is around 4.5%, 50% greater than that from 5'8". If that related directly to an increase in accuracy, in theory only players with a scoring average greater than around 80 would gain anything from aiming at T20 rather than T19.

Enough theory. Does real-life data show any signs of such effects in practice?

For just such data I am indebted to the PDC statistics king Christopher Kempf for diligently logging all the many thousands of darts thrown in the last two years' PDC Worlds (and do check out Chris's piece "Running For Cover" on the PDC website on how MvG's accuracy on T19 helped him gain his third World Title).

In the data from the two Worlds, the average chances of hitting both treble 20 and treble 19 were about the same, around 39%. That's interesting since not only do most players practice aiming at 20s a lot more than 19s, but also because the latter is likely to be mostly a "switch" target rather than a consistent one for three darts, which should reduce the hit chance. In fact Chris tells me his 2019 data shows the hit chance of a first dart at T20 is just 33.54%.

One way to eliminate such factors and give a fair comparison between accuracy at the top and bottom of the board might be to look at the hit success for lower-board as opposed to upper-board doubles (ie all those below 11 and 6 compared to all those above). Here the Worlds' data shows a 2% difference in favour of the lower doubles in 2018 (43% v 41%) and more than 3% in 2019 (40.5% v 37%).

So what am I saying in all this? I'm certainly not suggesting that top-flight players who have thrown at the lipstick in the attic for their whole careers with good success should suddenly completely switch to the 57 variety in the basement. What I am saying is that players of any standard, especially shorter ones, who are not achieving the results they think they deserve around the treble 20, should not be too proud to set their sights a little lower, if only to see how they do for a while.

Of course, if things go so well they get to start legs with five treble 19s in a row, they better remember to switch back upstairs if they ever want to get a 9-darter!

