

Successive Wins

The three-set series containing two wins in a row are WWW , WWL , and LWW (where W is a win, and L is a loss). Let p be the probability that Elmer beats his father, and let q be the probability that he beats the champion.

Using the champion-father-champion ordering, the probability of two wins in a row is:

$$qpq + qp(1 - q) + (1 - q)pq = 2pq - q^2p$$

Using the father-champion-father ordering, the probability of two wins in a row is:

$$pqp + pq(1 - p) + (1 - p)qp = 2pq - p^2q$$

Since, $p > q$, we know that:

$$p > q$$

$$pq > q^2$$

$$p^2q > q^2p$$

It follows that $2pq - q^2p > 2pq - p^2q$. Thus, Elmer should choose the champion-father-champion ordering.