what tennis research tells us about tennis scoring systems

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A series of articles on tennis scoring systems which have appeared in sport scientific publications are summarised below. Coaches interested in obtaining more information from these articles can find them using the relevant references.

No-ad scoring

The paper asserts that no-ad scoring modifies tennis tactics and strategy. The author states that it permits a two-set match to be played in under an hour, yet giving the players a better opportunity to test their skills in a competitive situation.

The author indicates that when not playing advantage the duration of the matches is shortened and every point becomes crucial. Tactics and strategy are more conservative than in the traditional scoring, mainly because a point is far more valuable.

One feature of no-ad scoring is that considerable effort and energy go into a point. In traditional scoring, at deuce, an error may be costly but not so much so that it is always decisive. In the no-ad scoring however, the player has no second chance. This led the author to recommend that players should learn to think no-ad and limit their attempts at outright winners. Coaches should in turn help their players to evaluate game situations and to make appropriate decisions.

Goldstein, B.J. (1977). No-ad scoring in tennis. *Scholastic coach*, 58-64.

Tie-break versus "win-by-two games" tennis rules

This paper compares the "win-by-two games" tennis rule with the effect of the tie-break rule on the

expected outcome and duration of a tennis set once the game score has reached 6-6. Within these situations, the probability of a particular player winning each point (when playing a specific opponent) may be estimated from previous matches between the two players.

If a player in a social match is given the option between the two rules, and she feels that her estimated probability of winning each point is less that 0.50, then her prospects for victory will be enhanced by choosing the tie-break rule.

The probabilities obtained indicate that the winner of the set will often be decided in less than half the number of points when the tie-break system is used.

Croucher, J.S. (1982). The effect of the tennis tie-breaker. Research Quarterly for Exercise and Sport, 53, 4, 336-339.

Probability of winning games

This paper analyses the status of each point played in a game of tennis. As well as giving the probability of each player winning from any score, it also determines the relative importance of each point.

The paper states that every point is equally important to both players. Additionally, the importance of a point is weighed by the expected number of times the point is played in a game. Several of the paper's conclusions are: 1. The point 30—40 always ranks higher in terms of importance than the point 15-30, 2. The first point (0-0) is always of only average importance, 3. No point has a consistently high or low ranking for all probabilities.

Croucher, J.S. (1986). The conditional probability of winning games of tennis. Research Quarterly for Exercise and Sport, 57, 1, 23-26.

New tennis scoring system

This study addressed the problem of delays incurred in the scheduled starting times of tennis matches as a result of unexpectedly long previous matches and devises a new scoring system to reduce the problem.

The subsequent aim was to take the present tennis scoring system and modify it as little as possible to produce a new scoring system with a more predictable duration. The new system is a best of five half sets system. This system is very similar to the present best of three tie-breaker sets system with only one exception – the standard deviation of the number of points in a match is typically considerably smaller with the new system.

The half sets operate in the following way: A half unit is awarded to a player as soon as that player's game score reaches four (4-0, 4-1, 4-2). The player would therefore also win the half set and receive one unit score. If the game score reaches 3-3, the half set counts as a draw and each player receives a half unit. The next half set is played. The match is over as soon as one player's score reaches 3 units. However, if the unit score reaches 2.5 to 2.5, a tie-break as is currently used, is played to determine the winner.

Pollard, G.H. (1987). A new tennis scoring system. Research Quarterly for Exercise and Sport, 58, 3, 229-233.

Reaction time and tie-breaks

The aim of this paper was to evaluate the reaction time of the return of serve while also comparing the speed of the serve with the percentage of tie-breaks at Roland Garros, Wimbledon and the US Open (1999). Results showed that:

1. Receivers decrease their success of returning when the serve is above approximately 100 mph,
2. Service speed is related to the surface played upon with grass having the fastest serves and clay the slowest,
3. The number of tie-breaks increase significantly at speeds above 110 mph, and
4. The higher the speed of the serve and the faster the surface, the greater number of tie-breaks that are played in matches.

Haake, S.J., Rose, P. & Kotze, J. (2000). Reaction time testing and Grand Slam tie-break data. In S.J. Haake & A.O. Coe (Eds.). Tennis Science & Technology. Blackwell Science. Oxford. (269-275).

Other references

Schutz, R.W. (1970). A mathematical model for evaluating scoring systems with specific reference to tennis. Research Quarterly for Exercise and Sport, 41, 552-561.