28th ECSS Anniversary Congress, Paris/France, 4-7 July 2023

The Influence of Scoreline on Passing Performance in Elite Soccer

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INTRODUCTION:
Passing value (i.e. number of passes or the percentage of successful passing) is regarded as a performance indicator for quantifying a team's style of football [1] with scoring teams achieving greater passing success in the five minutes leading up to a goal [2]. Furthermore, the losing or drawing team typically prefer holding a long possession period, while the winning team play with shorter possession periods [3]. However, the behaviour of passing (i.e. the location, the aim, the type of the passes) has not been examined. Therefore, the aim of this study is to use a self-organising map (SOM) [4] to detect passing patterns and find the association between scoreline and passing behaviours in elite soccer matches.
METHODS:
A SOM neural network was trained to classify 192,538 passes in to 12 passing behaviours from 835 high-performance soccer matches. Wilcoxon signed rank tests were used to investigate the changes in passing behaviour frequencies 5 minutes before a goal and during 8 potential scorelines (ATA: Ahead-to-ahead, ATC: Ahead-to-conceded, ATA: Ahead-to-Level, BTB: Behind-to-Behind, BTL: Behind-to-Level, BTC: Behind-to-Score, LTA: Level-to-ahead, LTB: Level-to-Behind). The different percentage of passing behaviour between paired scoring and conceding scoreline was examined by a Chi square test.
RESULTS:
4 significant changes were found in the frequency of passing behaviours between scorelines (except scoreline ATL and BTS). The frequency of pass type 8, Short- and mid- range passes in the central of the pitch towards to the lateral direction (left or right), was different before (0.88±0.33) and after (0.35±0.43) the ATL scoreline ($P < 0.001$). Significant differences were found in the percentage of passing behaviours among total passes before different paired scorelines (scoring teams and conceding teams). Normally, the conceding team played more defensive passes and sided passes (for example ATL: 39.50% defensive, 33.3% aggressive, 77.2% sided, 22.6% central) while the scoring teams play more aggressive and central passes (for example ATA: 31.3% defensive, 39.4% aggressive, 74.8% sided, 25.2% central).
CONCLUSION:
Out of 192,538 passes, the chosen artificial intelligence system created 12 classifications 5 minutes before and after goal scoring. Passing behaviours differed significantly across the pre- and post-scorelines, as well as between relative-paired scorelines. This result means in practice, coaches could give instruction to players on how to maintain or change the scorelines in games by tracking and changing the passing behaviours. The influence of scorelines during different times of the game and a unique series of contests on non-location-based passing behaviour in varying leagues with diverse playing styles should be the subject of future research.

1. Hewitt, Greenham, & Norton (2016), 2. Redwood-Brown (2008), 3. Paixão et al (2015), 4. Kohonen (2001)

Topic: Statistics and Analyses

Presentation Oral

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33885