much in studies of Chinese football matches. The aim of the study was to explore whether the macro-level network characteristics would show difference among teams with different outcomes (win, lose, draw) in Chinese Football Association Super League (CSL).
METHODS:
Passing data from each match in the 2017-2018 CSL season (a total of 16 teams and 240 matches) were analyzed using SNA to establish 480 passing networks. A total of four network measures, including clustering coefficient, network density, average path length and total links, were calculated for each team from every match with Pythons NetworkX. After testing the normality of the data, we ran one-way ANOVA and post-hoc tests to identify significant different pairs among winning 、 drawing and losing teams.
RESULTS:
The descriptive statistics are as follows: clustering coefficient(win:0.70±0.07,draw:0.68±0.08,lost: 0.69±0.06), network density (win:0.55±0.08,draw:0.56±0.08,lost: 0.56±0.06),average path length(win:1.41±0.11,draw:1.39±0.11,lost: 1.41±0.10), and total links(win:90±14,draw:90±12,lost: 97±11).We found that only the total links($P<0.0001$) showed significant differences under the three competition results. Next, the post-hoc comparison told us that there were significant differences in total links between winning and losing teams ($P<0.0001$) and between drawing and losing teams ($P<0.001$). The differences in both pairs yielded large effect size ($d=-0.502$ for win vs. lost; $d=-0.544$ for draw vs. lost). The network analysis of knockout phase of FIFA World Cup 2018 revealed that teams do not change macrostructures according to match status (i.e., losing, drawing, or winning) [2]. But in CSL, teams in the losing statuses have greater total links than the teams in the other two match statuses. This indicated that the high number of passes does not contribute much but somehow hinder to winning in CSL.
CONCLUSION:
Under the premise of maintaining the overall strength level of the team, the coaches should train the team members to establish a compact and effective passing network instead of a structure with as many passes as possible. This study provided insights into the training and performance evaluation of CSL teams.
1 Kothari,et al. (2014)
2 Gibson Moreira Praça, et al. (2019)

DECISION-MAKING PRACTICE IN YOUTH SOCCER: A CROSS-COMPARISON OF COACHING CONTEXTS FROM TOP-DIVISION PROFESSIONAL CLUBS IN ENGLAND, GERMANY, PORTUGAL, AND SPAIN

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Decision-making practice in youth soccer: A cross-comparison of coaching contexts from top-division professional clubs in England, Germany, Portugal, and Spain
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INTRODUCTION:
A key performance attribute that discriminates highly-skilled soccer players from their lesser-skilled counterparts is the ability to anticipate and make effective decisions under pressure during match play (e.g., [1]). Researchers have shown that these 'game intelligence' skills are primarily acquired through activities in which practice has the same underlying structure as competition (e.g., [2]). The aim of this study was to investigate the structures of practice activities used by youth soccer coaches working in the youth academies of professional top-division clubs from England, Germany, Portugal, and Spain. This was the first study to assess the microstructure of coach-led practice in youth soccer across multiple countries.
METHODS:
Altogether, 53 male soccer coaches working with under- 12 to under-16 age group male players across 16 youth academies of professional top-division clubs in four European nations took part. A total of 83 practice sessions were analysed in situ. Sessions were analysed for the proportion of time in 'non-active decision-making' (e.g., unopposed technical or tactical skills practices, fitness training) and 'active decision-making' activities (e.g., small-sided games, skills practice with opposition), with the latter deemed superior for the transfer of 'game intelligence' skills to match play.
RESULTS:
More time was spent in active decision-making (M = 62%) compared to non-active decision-making activities (M = 20%) and transitioning between activities (M = 17%). Players from Portugal and Spain spent a higher amount of time in active decision-making activities compared to English and German players. English players spent more time in unopposed technical-based drills and German players in improving fitness aspects of the game without the ball.
CONCLUSION:
Our findings extend previous research assessing coach-led youth soccer practice in single countries by demonstrating differences in specific training activities and environments between youth academies at professional clubs in multiple European countries.
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TRAINING LOAD RESPONSES MODELLING IN ELITE SPORTS: HOW TO DEAL WITH GENERALISATION ?

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INTRODUCTION:
Training load responses modelling in the way of performance optimisation is one of the most sport science studied topic since decades. While Banister et al. (1975) aimed to model the relationship between training and performance, statistics and informatics fields provides some further benefits. However, the generalisation ability of traditional models remains unknown and physiological interpretation drawn from these models have to be carefully reconsidered. Elite sport data are generally characterised by a few observations to model but also plenty of explanatory variables, according to the rise of wearable sport devices. Thus, we hypothesised that cross-validation procedures