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Original Articles

Distinctiveness in combat sport aesthetics

Jason Holt

School of Kinesiology, Acadia University, Wolfville, NS, Canada
jason.holt@acadiau.ca

ABSTRACT

According to some philosophers, sports where athletes actively struggle against their opponents are aesthetically enhanced because of the increased potential for drama arising from dynamics of social interaction. I argue that combat sports further increase the potential of such dramatic aesthetic appeal. In contrast to the comparatively abstract struggles of team sports, suggesting a more detached Kantian aesthetic, combat sports involve competitive struggles that are less abstract and more primal, suggesting a more engaged Deweyan aesthetic. I also argue for a hierarchy of primal appeal within combat sports from the minimally constrained primal appeal of mixed martial arts to the more abstract, less primal appeal of fencing. Between these extremes, grappling sports (e.g., wrestling, judo, and jiu jitsu,) have a more primal (and intimate!) but less dramatic appeal than striking sports (e.g., boxing, kickboxing, and taekwondo). I conclude by raising and resolving an apparent paradox suggested by my account.

KEYWORDS

aesthetics; fighting; drama; grappling; striking

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INTRODUCTION

There is a tendency in sport and philosophy of sport to adopt monolithic approaches to questions of aesthetic value. For one example, in debates about what makes sport movement graceful, most theorists propose universal accounts applying to sports generally. Best proposes that a movement in sport will be aesthetically pleasing insofar as it appears economical and efficient, whereas one that involves wasted effort or motion will appear ungraceful (1978, p. 107). For Cordner, on the other hand, grace consists in the fluid integration of different movement elements (1984, p. 308). Others argue that graceful movement in sport has no underlying properties (Davis, 2001, p. 92), or that in every instance we can cite natural properties that help explain achieving or failing to achieve aesthetic value (Mumford, 2012, pp. 27–28). For another example,

in many sports there is a presumption of homogenized technique such that there is only one correct way to perform a given skill, both the most effective and the most beautiful technique, such that departures from the presumed ideal are assumed to be less effective and considered less aesthetically appealing, even ugly, irrespective of the athlete's unique physiology, for which the presumed ideal might be inappropriate (Holt & Holt, 2010, pp. 212–214). These are but two examples.

In contrast to such monolithic approaches to sport aesthetics, others have proposed more pluralistic approaches. For one thing, it is fairly obvious than different sports and different types of sports appeal to different tastes. People tend to find certain sports and often a favorite sport more aesthetically rewarding than others. In the debate about graceful movement, one proposal that resolves the entire debate employs Best's distinction between aesthetic sports, in which aesthetic judgment and the awarding of style points are involved in determining scores, and purposive sports, which do not involve either (1978, pp. 104–105). The proposal to resolve the debate is that the functional account of grace proposed by Best holds for aesthetic sports but not purposive sports, whereas the fluidity account proposed by Cordner holds for purposive sports but not aesthetic sports, which coheres both with the lack of a single reductive basis for grace in all sports and allows for case-by-case explanation of the presence or absence of grace in terms of natural properties (Holt, 2020, p. 25). As far as univocal approaches to technique go, especially in purposive sports, a more pluralistic approach that acknowledges physiological, technical, and creative differences among athletes, and celebrates technical diversity from both a functional and an aesthetic point of view, seems superior to monolithic approaches that tend to express aesthetic bias and injustice in unrealistically denying or problematically repressing such athletic diversity (Holt, 2020, pp. 69–70). These examples should suffice to show the further significance of my discussion of combat sport aesthetics below. It is such a pluralistic approach to the aesthetics of sport that frames and informs my analysis of combat sports here.

AESTHETICS AND DIFFERENT TYPES OF SPORT

From an aesthetic point of view, many people find sports, and combat sports in particular, to be either uninteresting or even ugly. However, for those who are naturally drawn to combat sports as viewers or participants, or who acquire such a taste, these contests provide a wealth of aesthetically rewarding experiences, as do sports generally. Here I briefly examine a significant part of the aesthetic appeal of combat sports as distinct from, though similar to, that of other sports, team sports in particular. By doing so I hope to kick off a fresh attack on the aesthetics of sport and movement.

Let us note, again, that the subcategory to which a sport belongs can affect both the nature and the importance of its aesthetic properties. Alongside Best's distinction between purposive and aesthetic sports (e.g., hockey and figure skating, respectively), consider Joseph Kupfer's (1988, pp. 392–394) threefold categorization of sport. First, quantitative (or linear) sports are those whose outcomes are determined by measurement. One wins by running fastest, jumping farthest, lifting greater weight, or whatnot. Second, qualitative (or formal) sports are those where the outcome is determined by who performs best, usually in terms of both how difficult the performance is and how well or beautifully it is executed. One wins by having the best gymnastics rou-

tine, the best series of dives, or the best figure skating program, for instance. Third are what Kupfer calls *competitive* sports – a somewhat misleading term, since all sports are competitive – in which competing sides actively struggle against each other. Examples here include team sports like soccer, baseball, and hockey, and combat sports like boxing, wrestling, kickboxing, taekwondo, judo, jiu jitsu, and mixed martial arts (MMA), among others. To avoid confusion, I will substitute 'adversarial' for 'competitive' in designating these sports. It is adversarial sports, in particular combat sports and team sports, that concern me here, although each of Kupfer's types of sport tends to have its own sort of aesthetic appeal. High-level linear sports, for instance, tend to impress us with a "factual" aesthetic, where sheer achievement may be seen as beautiful in itself (Holt, 2020, p. 47). By contrast, formal sports, otherwise known as aesthetic sports, have a more artistic aesthetic appeal. Indeed, many of these sports are dancelike (figure skating, artistic swimming, gymnastics floor routines, etc.), with judgment, as already mentioned, informing the determination of outcomes. My focus, however, is adversarial sports, and combat sports in particular and in contrast to other types of adversarial sports, team sports in particular.

There are, of course, other helpful ways to distinguish different types of sport. Consider, for another example, the proposed distinction between mono and duo sports (Parry & Giesbrecht, 2023, pp. 14–15). Mono sports are characterized by trying to achieve a single competitive goal, whereas duo sports involve trying to achieve a competitive goal *and* preventing one's opponent from doing the same. In cycling, for instance, time trials involve racing only against the clock whereas sprints require racing against others.[1] Thus time trials are mono sports and sprints are duo sports. The latter could be seen as coextensive with the adversarial category, or alternatively as a broader category cutting across the distinction between linear and adversarial sports. The fact that it is unclear whether cycling sprints should count as quantitative (as time-decided) or adversarial (as interactive) could be seen as a deficiency. However, whether adversarial and duo sports are coextensive, or the interactive struggles of adversarial sports, as in wrestling, are more demanding than simply jockeying for position in a race, my focus and preferred terminology here is adversarial sports in the possibly though not necessarily narrower sense, where some duo events such as cycling sprints may fail to count as adversarial because the interaction is minimal in comparison with the types of sport that concern me here: combat sports like MMA and team sports like soccer. Nor am I concerned with specifying the outer limits of this category, since standard team sports and combat sports will clearly qualify as paradigm cases. My concern is rather the relationship between these paradigms and corresponding differences among various examples of the latter kind.

Part of the aesthetic appeal of sport is as a source of drama depending on viewer interest in the unfolding of an event toward an uncertain outcome (Holt, 2020, pp. 52–53). In Kupfer's (1988, p. 396) view, adversarial sports are aesthetically enhanced compared with quantitative and qualitative sports because of the added dimension of social dynamics arising from competitors trying to execute their own skills while also actively trying to frustrate their opponents' attempts to execute theirs. Along these lines, Steffen Borge argues (2019) that at the heart of the dra-

[1] Thanks to Jon Pike for this example.

ma-rich aesthetic appeal of soccer is what he dubs an *agon* aesthetics – 'agon' meaning struggle – embodied in such on-pitch efforts of opposing sides against each other as loved by soccer fans: aggressive tackles, close marking, leaping saves, and so on. In his agon aesthetics of soccer Borge identifies various interrelated elements, including drama, competition, social interaction, the uncertainty of events, and possible unfairness (2019, pp. 199–214). This perspective on sport aesthetics as involving the appreciation of competitive struggles will inform my discussion.

AGON AESTHETICS

Given these perspectives, two questions arise: does the agon aesthetics Borge attributes to soccer generalize to other adversarial sports, or indeed to all sports, and to what extent might this appeal vary across such sports? At times, Borge's phrasing suggests a limited application: "It is here that we find the basis of an agon aesthetics of football [soccer] and similar sports" (p. 206). At other times, however, the phrasing suggests broader application to all sports: "The aesthetics of competitions – the agon aesthetics – lies in engaging in the conflict that a competition is ... " (p. 206). Either way, both the kind and degree of agon aesthetics seem to extend and vary across different sports, and this is because within the broad confines of struggling to win, the degree to which one may interfere with one's opponent varies significantly, even within adversarial sports. Contact sports permit more physical interference than non-contact sports, for instance, and some permit more interference than others. Combat sports are structured around mutual interference, around actively struggling against an opponent's efforts and not just, say, struggling to control a ball or some other contested object or state of affairs. Activities like wrestling are paradigms of rule-governed struggles against an opponent. I will argue that the drama-based aesthetic enhancement of adversarial sports is *further* enhanced, and even peaks, in the context of combat sports. In an earlier work (Holt, 2021, p. 79) this view was proposed as intuitive but not given supporting argument. I will remedy that here. I will also argue that notable differences in agonistic appeal are discernible among combat sports themselves.

As the nature of competitive struggles varies significantly across sports, from no or close to no physical interference with one's opponent's efforts, as in various races, to the robust, active struggling against one's opponent's efforts that we find in adversarial sports and combat sports in particular, there are important differences in agon aesthetics depending on the degree and kind of mutual interference permitted in various sports. There is, in other words, a continuum of athletic struggles ranging from pure *agonistic* efforts with zero or little interference between competitors to *antagonistic* efforts in which the activity itself is defined in terms of active physical struggles between antagonists. In a finer-grained analysis, then, we have an "agon-to-antagon" continuum of competitive struggles in sport. Adversarial sports, such as team (especially contact) sports and combat sports, have a more antagonistic element insofar as more physical interference with one's opponent's efforts is permitted. The competitive agon of such sports is realized not just through strategic opposition but also through substantial physical antagonism.

If we consider what it means to exert effort against someone whose purpose conflicts with our own, we should note another continuum ranging from basic physical

struggles for survival to the abstract, intellectual, nonphysical struggle of trying to win at a game like chess. This is my own proposal, that we examine the aesthetics of sports in terms of varying degrees of primality and abstractness, not only because it seems intuitive to do so, but because it captures something important about differences among types of activities involving conflicts between people, both inside and outside sport, as well as the aesthetic appeal of those activities. Toward the former extreme, that of basic vying for survival, we find struggles that are more *primal*, and toward the latter we find struggles that are more *abstract* and less primal. Because sports are physical games, those that require struggling against an opponent will be more primal and less abstract than the competition in a non-sport game like chess, but also more abstract and less primal than real life-or-death struggles, between predator and prey for instance, in a state of nature. In comparison with everyday civilized life, sport and specifically adversarial sport will be, and will have an aesthetic appeal, much more primal than abstract.

In adversarial sport, however, it seems clear that the agon aesthetic is more abstract in some cases and more primal in others. If one watches or participates in a paradigmatic team sport like soccer and compares it with a paradigmatic combat sport such as wrestling or MMA, these activities tend to engender different types of appreciative response in different audiences (though one could certainly enjoy both). In a team sport like soccer, for instance, the object is to put the ball in a net by prescribed means more often than your opponent, whose efforts to do the same you try to impede as they try to impede yours. The means are artificially constrained by game rules within the wider confines of natural law, as in other sports, but the end is also far removed, that is, abstracted from, the needs of everyday life or the primal urgency of desperate situations. When one watches soccer, the resemblance to natural conflicts unrestricted by rules is far thinner. There are certainly organized collective efforts in nature, but nothing resembling a soccer game in any real sense. In combat sports, however, despite the presence of artificial constraints, which are often motivated by safety concerns, the purpose of, say, submitting an opponent in wrestling is a far more primal, less abstract objective, where the means for doing so also has a more primal than abstract appeal. It will be hard to watch MMA and not be put in mind of primal, unrestricted fighting, since the sport is designed to be as close to such primal conflicts as minimally decent safety protocols will allow. In this way, the more primal side of aesthetic appeal comes to a peak in combat sports.

AESTHETICS AND COMBAT SPORTS

In general, the aesthetic appeal of struggles in team sports is more abstract and less primal, if still notably primal, in comparison with combat sports. The implication is that the agon aesthetics of combat sports will be further enhanced and more dramatic for those whose aesthetic sensibilities are geared more to the primal than to the abstract. Team sports tend to be more popular than combat sports,[2] true enough, though

[2] Team sports dominate lists of the world's most popular sports, whereas combat sports typically fail to make the list at all. To take one example, according to Veroutsos (2023), seven of the top ten most popular sports in the world are team sports (soccer, cricket, hockey, volleyball,

combat sports such as MMA have not only grown in popularity in recent years but also seem uniquely well-suited to addressing psychological needs for primal expression otherwise neglected in the world of sport (Holt, 2021, p. 83). To the extent that the agon aesthetics of combat sports is enhanced in this respect over and above that of team sports, it is owing to an appeal that is more primal and less abstract than that of team sports. Sport itself, again, may be seen as abstracted from more primal struggles (for survival, etc.) by the rules, although its physicality will be sufficient to qualify it as more primal and less abstracted from such basic conflicts than, for instance, board games. Adversarial sports likewise are more primal than other sports because they are less abstracted from natural conflicts such as unrestricted fighting than are sports allowing minimal interference with the competitive efforts of one's opponents. Furthermore, among adversarial sports, combat sports (e.g., MMA) are more primal than and less abstracted from actual fighting than team sports (e.g., soccer). In terms of abstracting from primal conflict, then, combat sports are more primal than team sports, adversarial sports more primal than other sports, sport generally more primal than other games. Although this points to combat sports having an enhanced dramatic appeal owing to struggles not just *with* but actively *against* one's opponent, the most appealing team sports are more popular than the most appealing combat sports, despite ranking lower on the scale of agon aesthetics, or so my argument suggests. Why this may be so is a subject for another time, though it seems evident that agon aesthetics alone is not the whole story in either case.

It is worth noting as an aside the contrast between competing accounts of aesthetic experience championed by Kant and Dewey, respectively. Kant's (2005, §2) account frames aesthetic experience in terms of psychological distance where one appreciates beauty for its own sake. Dewey's account (1980, pp. 36–37), by contrast, pictures aesthetic experience in terms of not disinterest but self-interest, only a more intense, more holistically coherent sort of pleasure than we usually encounter. I argue elsewhere (Holt, 2020, p. 34) that these differing views of aesthetic experience may be reinterpreted not as competing views but as describing different types of aesthetic experience pluralistically conceived. On such a view, the agonistic appeal of team sports elicits a more Kantian aesthetic response, whereas that of combat sports elicits a more engaged Deweyan aesthetic response.

Within the class of combat sports themselves there appears to be a hierarchy of primal appeal. The combat sport with the most primal appeal is probably MMA, since it is far more permissive than other combat sports in allowing techniques derived from a variety of martial arts and combat sports. At the other extreme, much more abstract and less primal, is probably fencing. (I assume an exclusion of such sports as archery and riflery, which though combat-related do not involve actively struggling against an opponent's efforts.) Although martial sword fighting is indeed primal, modern fencing is far removed from such extreme cases, first through the implementation of much safer first-blood dueling, then made safer and abstracted further through sport fencing's restrictions on equipment, target, and attack (Lawrence, 2010, pp. 203–204). In foil,

basketball, baseball, and rugby) with three individual (or pair/group) sports rounding out the top ten (tennis, table tennis, and golf). Even popular combat sports such as boxing and MMA invariably fail to make these lists.

for instance, one scores only with the point, only on the torso, and only with the right of way. Even in martial swordplay the presence of a weapon provides some measure of distance and abstraction.

Most combat sports, whether grappling or striking, fall somewhere in between the plausible extremes of MMA as the most primal and fencing as the most abstract. In this intermediate range we find grappling sports and arts like wrestling and jiu jitsu and striking sports and arts like boxing and taekwondo. In this middle ground we have a further division based on the distance between opponents in striking sports and arts, which lean toward the abstraction of fencing while remaining more primal, and the closeness, the intimacy of grappling, which inclines toward MMA in primal appeal though is less permissive and so more abstract. The primal appeal of grappling, however, often appears to be outweighed by the excitement of striking. Grappling has a more primal but less dramatic appeal, and striking has a less primal but more dramatic appeal. Thus, in MMA, although audiences appreciate the openness of rules allowing grappling as well as striking techniques, long grappling exchanges tend to be less fan-friendly than long striking or blended exchanges.

CONCLUSION

There may appear to be a paradox suggested by my analysis to the effect that combat sports represent such a wide spectrum of primal-to-abstract aesthetic appeal, since it was primal rather than abstract appeal that I argued distinguishes and enhances the drama of combat sports beyond the agon aesthetic of team sports. Overall, however, where quantitative and qualitative sports may be dramatic and aesthetically appealing, the drama and aesthetic appeal of adversarial sports on the whole will be comparatively enhanced because of the primal nature of their inherent struggles. Though fencing is hardly primal at all when compared with MMA, it ranks as more primal in dramatic appeal than soccer, and because of its derivation from martial sword fighting has a more primal objective (to hit the opponent with a weapon) than that of even the most primal team sport, probably rugby (to touch a ball inside a patch of pitch and kick it through the uprights). What this means, given the preeminent popularity of team sports, soccer in particular, is that most people's taste in sport would seem to prefer a blend of the primal appeal of physical struggles with the abstract appeal of struggles that fall short of being fights. Whether this ought to be the case is an open question. Another open question is just how pluralistic the aesthetics of sport, or anything else for that matter, should be. I will not presume to answer either question here.

Although my focus throughout has been distinguishing the aesthetic appeal of combat sports from that of other sports, and that of team sports in particular, the wider significance of this view is worth mentioning again. That is, the aesthetics of sport can benefit not only from looking at sport in general or at particular sports, but also from examining differences among different sport subcategories, whether combat sports and team sports, as I have here, purposive versus aesthetic sports, as has been addressed elsewhere, and so on. Along these lines, several possibilities for future research suggest themselves. It seems, for instance, that there are telling aesthetic implications that follow from Parry and Giesbrecht's distinction between mono sports and duo sports, as in the former there will be little if any chance for the social interaction

needed for agon aesthetics in Borge's sense, since mono sports, by definition, allow no such interaction during athletic performances. Consider, likewise, the differences in aesthetic appeal between the category of team sports and that of individual sports, or between ball sports, where things happen and change quickly, often unexpectedly, and sports lacking such dynamics. Such analyses would complement extant work in sport aesthetics, as well as enhancing the profile of this subdiscipline in a field that regrettably often neglects it. I hope that this article helps to nudge the field toward such further development and inclusion.[3]

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Democratic deficit within the electoral system of the Football Association of the Czech Republic

Michaela Kaprálková

Department of Sport Management, Faculty of Physical Education and Sport, Charles University, Prague, Czech Republic
michaela.kapralkova@ftvs.cuni.cz

ABSTRACT

This study analyzes the electoral system of the Football Association of the Czech Republic (FACR) to explore the democratic deficit inherent in its governance structures. Recent trends in Czech football, marked by issues such as corruption and conflicts of interest, highlight the need for optimal governance to enhance accountability and transparency. This research examines the FACR's new statutes effective from March 2025, comparing them with earlier versions to identify persistent democratic shortcomings. Methodologically, the study employs qualitative document analysis, focusing on the statutory changes and their implications for stakeholder representation and decision-making processes. Key findings indicate that while some reforms aim to mitigate negative practices, the dual Chamber structure and uneven voting rights for different stakeholders undermine genuine democratic participation. Professional players and other vital contributors lack voting rights, leading to a governance model that fails to reflect the interests of all members. The study concludes that without further reforms to address these disparities, the democratic deficit within FACR is likely to persist, limiting the organization's ability to foster a fair and equitable football environment in the Czech Republic.

KEYWORDS

good governance; negative phenomena; stakeholders; representation; voting rights

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INTRODUCTION

In the very dynamic sport industry, several governance-related issues may arise, such as clientelism, corruption, or conflict of interest. Clientelism involves exchanging goods or services for political support, marked by power imbalances (Elliott, 2016). In sports federations, political authorities often favor individuals or groups offering political backing (Erturan-Ogut & Sahin, 2014). Conflicts of interest in sports governance often arise from individuals holding overlapping roles, with insufficient separation of regulatory, financial, and operational responsibilities leading to biased decisions (Parrish & Miettinen, 2014). Corruption in sports includes bribery, match-fixing, and fund mismanagement, typically aimed at gaining unfair advantages or personal benefits, thereby eroding the ethical principles of sport (Gorse & Chadwick, 2016).

In recent decades, Czech football and its governance, particularly the Football Association of the Czech Republic (FACR), which is a registered association by law, have been plagued by issues like corruption, mainly match-fixing but also misuse of funds (Pěruška, 2014; Numerato, 2016), clientelism which kept people perpetuating the corruption in power (in principle also described by Elliott, 2016 or Doidge, 2018), and conflicts of interest based primarily on deciding what people to put in the decision-making positions based on personal relationships rather than relevant competencies, which may benefit them but not the organization as a whole (Numerato & Baglioni, 2012), and one person or group of people occupying several power positions (Kaprálková, 2021).

It is important to state that while individual behaviors contribute to these issues, suboptimal governance structures significantly perpetuate these issues (Geeraert, Alm, & Groll, 2014). An essential aspect of democratic governance in sports organizations is the representation of all stakeholder groups (Geeraert, 2018), which must be reflected in governance structures (Hoye et al., 2020). Ensuring such inclusivity can facilitate the election of an Executive Board by the General Assembly that genuinely represents and acts in the best interests of members (Hoye & Cuskelly, 2007; Thompson et al., 2023). The process by which representatives are elected and selected to represent the membership base directly influences participation and engagement. Professional clubs, for instance, are often the most motivated to participate actively in governance processes (Enjolras & Waldahl, 2010; Karel, 2024), however, these are not the only stakeholders that should be included in the decision-making processes, players, coaches, referees, managers, etc. are important stakeholder groups as well.

The most important information about governance structure is incorporated in the Statutes of the registered association (Civil Code No. 89/2012 Coll.). Therefore, qualitative analysis and comparison of the Statutes from 2019 & 2024 are used as the main methods to determine the changes within the democratic deficit that arises in the electoral system of FACR.

Democratic deficit – research framework

The concept of democratic deficit extends beyond critiques of certain European Union bodies, representing the suppression of democratic principles in organizations or societies, particularly when negative phenomena occur repeatedly over time (Elliott, 2016). In general, democratic deficit reflects the inconsistency between democratic

ideals, where policies should reflect the majority's will, and the actual policy decisions made (Lax & Phillips, 2012). A central issue with a democratic deficit is the lack of accountability of governance structures to the individuals they affect, i.e., their members (Grigorescu, 2013).

A sufficient degree of democracy in sports organizations, along with accountability and transparency, constitutes the principles of "good governance", which determine whether governance structures effectively serve stakeholders' best interests (Geeraert, 2018), even though there is no ideal type of sport governance that would fit all the sport organizations Parent et al., 2021). Member-elected governance systems emphasize representation, wherein a few individuals make decisions on behalf of many (Stenling et al., 2023). Effective governance in sports organizations depends on a well-defined framework of rules, strong leadership commitment, and active stakeholder participation to promote transparency, accountability, and inclusivity (Mrkonjić, Bayle, & Parent, 2024).

According to "good governance" principles, suboptimal participation in decision-making or imbalances in power distribution at different levels of governance signifies a democratic deficit (Geeraert & van Eekeren, 2021; Geeraert, 2018). For voluntary organizations operating within democratic states, democratic infrastructure is essential (Enjolras & Waldahl, 2010). Nonprofit associations like FACR must ensure that all members over 18 can, on some level of governance, participate in decision-making processes or elect representatives to advocate for their interests (Civil Code No. 89/2012 Coll.).

Kaprálková (2021) identified five areas of democratic deficit in the electoral system of FACR. The existence of the Moravian and Czech Chamber, which blocks the basic democratic rule of the majority win; the professional clubs' legal form that prevents important groups of stakeholders such as professional players and coaches from having voting rights; the way lower levels of governance of FACR behave and aren't controlled well enough; how some important groups of stakeholders aren't represented at the General Assembly at all; and last but not least how there is lack of structure around the process that determines which clubs of the 3rd and 4th tier divisions can send their representatives to the General Assembly.

The Czech context and FACR

FACR's governance model follows a mixed electoral system (Figure 1), where membership is club-based. Representation in governance depends on the league level: lower-tier clubs elect representatives to district or regional organizations, which in turn elect representatives to FACR's General Assembly. This multi-layered system can reduce direct member participation and hinder democratic processes (Enjolras & Waldahl, 2010).

Figure 2 describes what body/organization the leagues are organized by, which is crucial to determine who sends representatives directly to the FACR General Assembly and who sends representatives to the regional levels of governance. The professional football clubs and clubs that play 3rd and 4th level leagues have the right to send their representatives directly to the FACR General Assembly (with some exceptions described in the Results), clubs on the 5th to 7th league levels send their representatives to Regional Football Associations (RFA), and clubs on the 8th to 10th league levels send their representatives to District Football Associations (DFA).

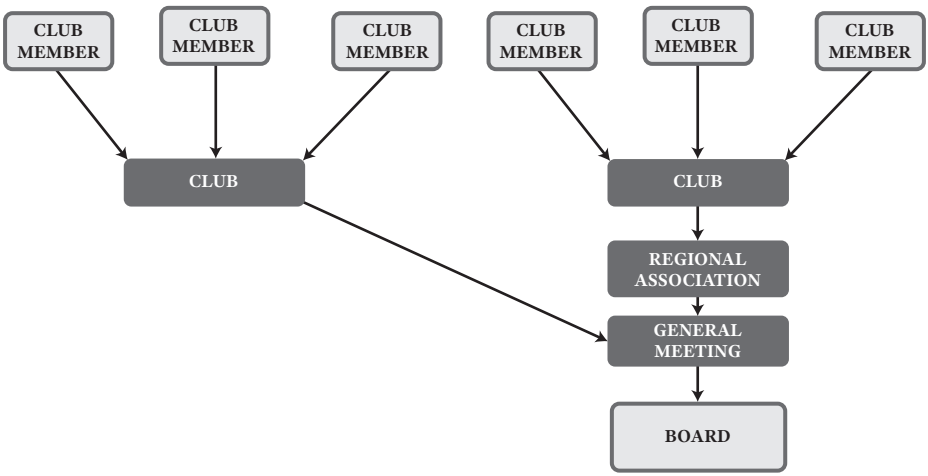

Figure 1 FACR's electoral system based on club membership

Source: Král (2015)

Figure 2 Organizations responsible for different league levels

Source: Author's own work inspired by Slavík (2014)

DFA's and RFA's then each decide at their meetings who represents each of them at the FACR General Assembly.

Active participation in governance fosters accountability and transparency (Geeraert, Alm, & Groll, 2014). However, FACR's current structure disproportionately emphasizes geographic and hierarchical considerations rather than the inclusivity of all stakeholder groups (Geeraert, 2018). Professional players and other key stakeholders are not guaranteed voting rights, even though their role is crucial for the delivery of sports performance, and they should be somehow represented in the organizational governance. This deficiency aligns with the democratic deficit concept, wherein systemic barriers prevent equitable representation (Enjolras & Waldahl, 2010).

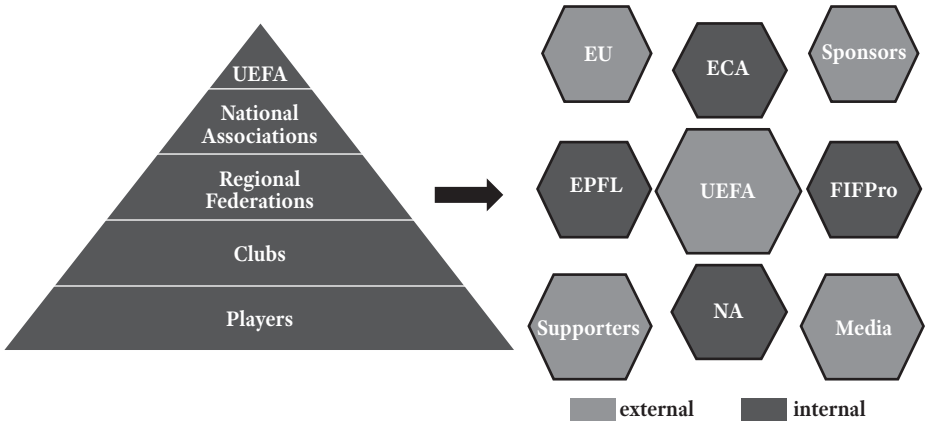

Figure 3 Stakeholder network in governance structure

Source: Schubert (2014), inspired by Garcia (2011)

As Schubert (2014) illustrates, UEFA has, to some extent, adopted a "stakeholder network" governance model (Figure 3), moving away from traditional pyramid structures to distribute power more equitably (Garcia, 2011). Such reforms aim to prevent power consolidation by giving members (various stakeholder groups such as player – FIFPro or National Associations – NA) decision-making power while separating regulatory, executive, and dispute-resolution functions, similar to the separation of powers in states (Kreft, 2017).

The persistence of clientelism and corruption in Czech football during the last decades underscores the need for reforms of FACR's governance, particularly its electoral system. By March 2025, FACR will implement statutory changes addressing some of these deficiencies. Evaluating how these changes align with democratic principles and tackling the previously arising democratic deficit will be crucial for determining their impact on democratic participation and decision-making.

METHODS

This article aims to identify changes regarding the democratic deficit in the electoral system of FACR based on the analysis of the new statutes (effective from March 2025).

The primary method employed in this study is qualitative document analysis, focusing on the FACR statutes from 2019 and the revised statutes from 2024, along with the explanatory report on the changes. Specifically, the study focuses on the non-optimal representation of members in the governing bodies and potentially even decision-making.

Conceptualization

The previously identified areas of democratic deficit are used as the main concepts of the qualitative analysis (Figure 4).

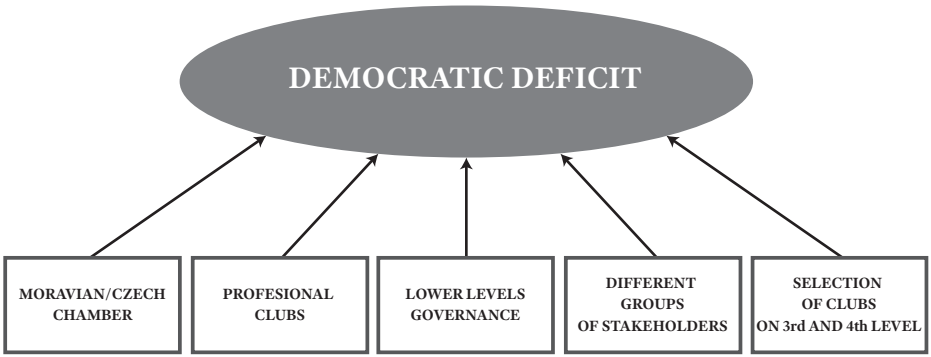

Figure 4 Democratic deficit in FACR

Source: Kaprálková (2021)

Thematic coding was used as the tool to structure the data.
Outcomes of the Qualitative Analysis:

- Summarization of the elements of the democratic deficit in the FACR electoral system based on the Statutes from 2019.
- Summarization of the changes in the new FACR statutes (2024) related to the emergence of a democratic deficit in the electoral system.

RESULTS

Moravian and Czech Chambers

The division between the Moravian (eastern part of the Czech Republic) and Czech (central and western part of the Czech Republic) Chambers was a central feature of FACR's electoral system. According to the statutes: "The General Assembly can make decisions if a majority of representatives from the Czech Chamber and a majority of representatives from the Moravian Chamber are present. Unless otherwise stipulated in these Statutes, decisions of the General Assembly are adopted if a majority of the present representatives from the Czech Chamber and a majority of the present representatives from the Moravian Chamber vote in favor" (FACR, 2019, p. 25). This structure, rooted in historical tradition, gave precedence to geographic location and league hierarchy in decision-making participation. However, it effectively blocked the democratic principle of majority rule by allowing decisions to be contingent on both Chambers' approval, even though the Moravian Chamber had significantly fewer representatives.

The changes

The division into the Moravian and Czech Chambers remains unchanged under the new statutes, with only slight modifications in wording and power distribution. The Czech Chamber has 127 representatives compared to 75 in the Moravian Chamber (Figure 5). The requirement that decisions pass with a majority in both Chambers persists, allowing the smaller Moravian Chamber to approve or block decisions with few-

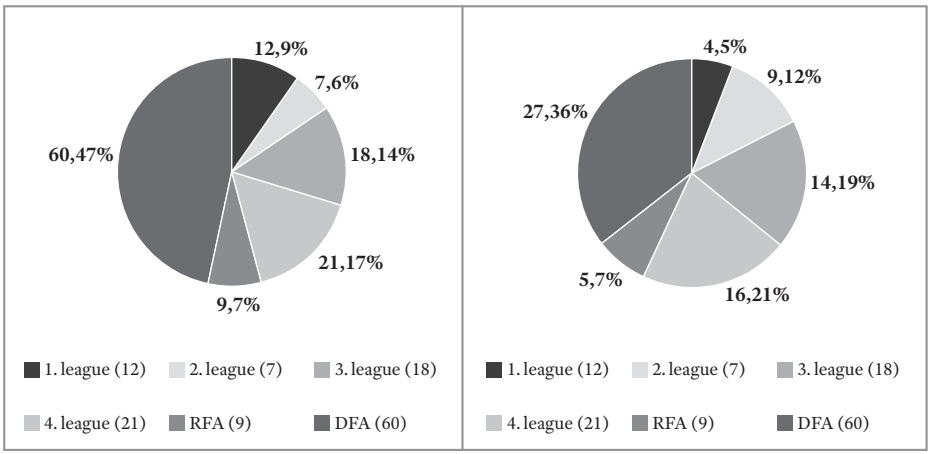

Figure 5 Czech and Moravian Chamber

Source: Author's own work based on FACR (2024a)

er votes. This arrangement continues to deviate from the principle of majority opinion prevailing, which highlights the ongoing democratic deficit within this structure.

Professional clubs and individual rights

Professional clubs held significant voting power in the FACR system, justified by their financial contributions to football. Each of the professional football clubs could send one representative directly to the FACR General Assembly: "Member clubs of the 1st League, 2nd League, Czech Football League, and Moravian-Silesian Football League, each with one representative" (FACR, 2019, p. 21). If the club had an A-team in the first league and a B-team in the second league, they could only send one representative.

However, in this scenario, coaches, players, and other members of FACR who joined through professional clubs (joint-stock companies) were entirely denied any voting rights. Decisions about who would represent a club at the FACR General Assembly were made solely by the club's Executive Board or shareholders, which is caused by the fact that professional clubs in the Czech Republic are usually joint-stock companies and not registered associations. This left professional players, coaches, etc., without voting rights. The same situation where people who are members of the FACR via professional clubs are denied voting rights occurred, for instance, even when those people were part of B-teams that were in leagues organized outside the League Football Association (meaning non-professional leagues), as they were still tied formally to the professional clubs.

The changes

The new statutes strengthen the position of professional clubs. B-teams in the second-highest league now count as separate entities, enabling such clubs to gain additional representation, whereas this is: "the only case when one club can have more

than one vote" (FACR, 2024b). Moreover, professional clubs will now have one representative directly on the FACR Executive Board, expanding its size to 13 members. FACR justifies the enhanced position of professional clubs by referencing similar arrangements abroad and their recent economic success, including broadcasting rights initiatives (FACR, 2024b).

The fact that professional players, coaches, etc., can't vote within their clubs and decide on who their representatives are at the General Assembly remains the same because of the legal form of professional clubs (joint-stock companies).

Lower-level governance issues

At the local level, FACR clubs were largely unregulated by the statutes. Clubs could choose different electoral terms for their Executive Boards and, in some cases, even avoid holding General Assemblies altogether, allowing the same individuals to remain in leadership positions indefinitely. The lack of uniformity and transparency in local governance created significant irregularities and limited members' ability to influence decision-making processes.

In terms of DFAs' and RFAs' structure and functioning the old Statutes mentioned this: "Each Regional Football Association ensures, in accordance with its scope of activities, the fulfillment of the Association's tasks within its jurisdiction for the region of the Czech Republic for which it is established and is authorized, within this framework, to acquire rights and obligations to the full extent" (FACR, 2019, p. 3), and then there were a few statements about whom their representatives elect and what proposals they can submit.

The changes

The lower-level clubs' position remains the same, and they are not required to follow specific instructions in terms of how they are organized besides the Czech law. However, the new statutes attempt to address RFAs' and DFA's issues by requiring them to align their operations with FACR's statutes (FACR, 2024b). FACR will now provide a model statute outlining areas where deviations are permissible and where they are not. This change aims to prevent irregularities in the scheduling of General Assemblies at the local level.

Regarding DFAs: "The regular General Assembly of the DFA is convened by the DFA Executive Committee once a year, with the regular election General Assembly required to take place once every 4 years during the period from January 1 to February 15. The DFA Executive Committee is obligated to convene the General Assembly and publish the invitation, including the date, location, and proposed agenda, no later than 4 weeks before it takes place" (FACR, 2024a, p. 23). Regarding RFAs: "The regular General Assembly of the RFA is convened by the RFA Executive Committee once a year, with the regular election General Assembly required to take place once every 4 years during the period from March 1 to April 15. The RFA Executive Committee is obligated to convene the General Assembly and publish the invitation, including the date, location, and proposed agenda, no later than 4 weeks before it takes place" (FACR, 2024a, p. 22).

This helps foster the democratic principles as the political cycle here copies the FACRs one, and the RFAs and DFAs have to not only organize the General Assem-

blies but furthermore also properly inform about it, which can help raise transparency within the electoral system.

Representation of different groups of stakeholders

Representation in FACR governance was based primarily on geography, levels of governance, and league levels rather than roles within the sport. Members such as players, coaches, referees, and club managers lacked direct voting rights. Stakeholder representation was tied solely to club hierarchy (if it was a registered association, there was a chance for different groups of stakeholders to vote and get elected to stand for their rights if it was a joint-stock company, there wasn't), with no mechanism to include individuals based on their contributions or roles in the football ecosystem.

The changes

Changes in the new statutes reflect a limited effort to address stakeholder representation. The official associations of football agents, players, coaches, and referees gain advisory voting rights. "AFA, CAFH, the Union of Czech Football Coaches, and the Union of Referees send their representatives in accordance with their internal regulations as per paragraph 1, letter b), with each sending one representative. This representative is entitled to speak on every agenda item at the General Assembly and to submit proposals and comments in accordance with the rules of procedure of the General Assembly" (FACR, 2024a, pp. 11–12). Nevertheless, this advisory role does little to address the exclusion of other stakeholder groups.

Selection of clubs in the third and fourth tiers

Clubs in the 4th tier (Divisions) faced significant representation challenges. The selection of representatives to the General Assembly was determined through an unspecified process. The only mention in the statutes was that: "21 representatives elected at the assembly of member clubs from divisions in Bohemia (note: Czech Chamber), 14 representatives elected at the assembly of member clubs from divisions in Moravia" (FACR, 2019, p. 21). The unspecified process that determined which clubs could send the representative to often raised transparency and legitimacy concerns.

The changes

The updated statutes introduce new terminology, officially designating the third tier as the "3rd League" and the fourth tier as the "4th League" (that also applies to other leagues they are about to be named by their level). Clubs from the Czech Football League (CFL) and Czech divisions collectively send 39 representatives to the General Assembly, with a maximum of 18 from the CFL. Similarly, the Moravian-Silesian Football League (MSFL) and Moravian divisions send 30 representatives, with up to 16 from the MSFL. Here, the B-teams can't send their representatives (FACR, 2024b).

The process of selection when there are more eligible clubs than spots for the representatives that could be sent to the General Assembly remains unspecified to some extent however, the new statutes state that: "Clubs of the 3rd Czech League, whose representatives are elected at the assembly of member clubs of the 3rd Czech League, attended only by members of statutory bodies or authorized members of FACR affiliated with the respective member club, with a maximum of 1 representative per mem-

ber club" (FACR, 2024a, p. 11). Also: "Member clubs of the 4th Leagues in Bohemia (note: Czech Chamber) send a number of representatives such that their total, together with the representatives according to letter b), amounts to 39. These representatives are elected at the assembly of member clubs of the 4th Leagues in Bohemia, attended only by members of statutory bodies or authorized members of FACR affiliated with the respective member club. None of them may serve as a representative for another member club" (FACR, 2024a, p. 11). The same principle applies to the Moravian-Silesian 3rd and 4th-level clubs. Therefore, at least the basic framework for who can decide about the 3rd and 4th level representatives is set. Currently, CFL sends to the FACR's General Assembly 18, Czech Divisions 21, MSFL 14, and Moravian Division 16 representatives.

Additional provisions in the new FACR statutes that indirectly influence the electoral system include a more precise definition of conflicts of interest, stating that: "No one is allowed to make decisions on a matter that directly concerns them and where circumstances suggest that their involvement in discussing and deciding could result in an advantage or harm for themselves, their close relative, or a member club to which they are affiliated as a member of FACR" (FACR, 2024a, p. 24), stricter vetting of elected candidates, and a ban on holding employment in FACR subsidiaries while occupying an elected position.

A notable improvement is the automatic transfer of a player's membership upon their transfer to a new club, eliminating prior complications (FACR, 2024b) when players transferred to a new club but technically stayed members of the former club until any of the clubs made a formal proposal to change the membership from the former club to the new one.

Another key change in the area of membership establishment is the introduction of a named list of individuals who cannot become members of FACR (FACR, 2024b). Membership may be terminated if a member acts in violation of the regulations of FACR, FIFA, or UEFA, and the Executive Board decides about putting and erasing people from this list (FACR, 2024a).

Even though the effort to move towards more democratic procedures and representation, some of the changes fall short of providing voting rights to stakeholders, leaving the governance structure heavily reliant on geographic separation and league-level-based representation.

DISCUSSION AND CONCLUSION

This article identifies the changes in the democratic deficit in the electoral system of FACR based on the analysis of the new statutes (effective from March 2025). Five main areas of democratic deficit were analyzed: the existence of Moravian and Czech Chambers, Professional Clubs, and Individual Rights, Lower-Level Governance Issues, Representation of Different Groups of Stakeholders, Selection of Clubs' representatives in the Third and Fourth Tiers.

Enjolras & Waldahl (2010) mention that professional clubs often have the greatest tendency to be active, which raises the question of whether their financial contributions sufficiently justify their increasingly prominent role within the FACR electoral system (Karel, 2024). This is particularly debatable given the fact that they also have

their own organization, the LFA, which oversees professional leagues. On the other hand, it can be argued that the professional clubs' push for more influence within FACR stems in part from the fact that public funding is directed toward their youth programs (which are typically organized as registered associations) due to their financial investments in the football development in general, and also due to the significant power that District and Regional Football Associations (DFS and RFS) wield at the FACR General Assembly as bodies representing 5th and lower division clubs.

Even though the number of representatives of RFAs (Czech Chamber: 9, Moravian Chamber: 5) and especially DFAs (Czech Chamber: 60, Moravian Chamber: 27) is relatively high, it may not necessarily be problematic that so many clubs from the 5th and lower tiers have representation big representation, considering the big number of clubs that fall into these brackets. The issue arises when there have been instances of bypassing regular electoral cycles when choosing different than 4-year-long terms, which should now be addressed by requiring DFA and RFA to adhere more closely to FACR statutes.

One of the challenges in optimizing FACR governance, particularly within the electoral system, is the persistent argument in the public sphere that it operates within the civil sector (i.e., a private organization). However, it can be argued that as long as the organization is partially funded by public resources, it should adhere to good governance principles to a certain extent (Král, 2014; Kaprálková, 2021). Another key argument is that an organization structured as a registered association is formed to meet the needs of its members, meaning that members should always have the opportunity to participate adequately in decision-making through the electoral system (as outlined in the principles of good governance, e.g., Geeraert, 2018).

The new FACR statutes, effective from March 2025, reflect at least an attempt to prevent some negative practices, even though not all directly pertain to the electoral system. Measures such as a blacklist of individuals who cannot become FACR members, a more detailed description of conflicts of interest, improved vetting of candidates, and efforts to eliminate dual roles held by some elected representatives who are also employed in various positions within subsidiary companies, could potentially bring FACR closer to implementing more democratic principles within its structures.

A certain rigidity in the electoral system, among other aspects, cannot be easily reformed, despite the apparent efforts to introduce democratic principles in some areas (as discussed by Slavík, 2014; Král, 2014). Even if a conflict of interest is uncovered, elected representatives may complete their terms, meaning a representative sent to the FACR General Assembly who is in a conflict of interest could still vote for the Executive Board in the June 2025 assembly.

In addition to the system's rigidity regarding changes toward good governance, the primary issue in FACR's electoral system from the perspective of democratic deficit is, apart from the division into the Moravian and Czech Chambers, its continued reliance on voting rights based largely on geography and league levels. However, even this principle is inconsistently applied, as some clubs from the 3rd and 4th levels are allowed to send representatives to the FACR General Assembly while others are not. Moreover, professional players, coaches, and other specialists have no voting rights in the system due to the legal form of their clubs (joint-stock companies) through which

they are FACR members. The newly introduced advisory vote for the representative organizations of players, coaches, intermediaries, and referees offers only minor compensation for this democratic deficit, which is contradictory to the statement of Hoye et al. (2020) that all relevant groups of stakeholders should be somehow accordingly represented within the governance structures.

The limitations of this lie in not having the empirical data of the changes being implemented yet and the analysis is solely based on the statutes. Therefore, we can only guess what the actual impact would be, especially in the case of the advisory votes, etc. Also, there might be other internal documents besides the statutes put in place in the future that change the context of some of the democratic deficit issues.

This research shows where the democratic deficit in the FACR's electoral system may arise in the next years based on the new statutes. It identifies that even though some positive changes are visible, the development of FACR's governance and, specifically, the electoral system must continue towards good governance practices if the fair, sustainable environment and continued football development are about to be upheld in the Czech Republic. The important aspect is to focus not only on the structure of governance but also on how different stakeholders behave so that they uphold good governance principles (Mrkonjić, Bayle, & Parent, 2024). Future research should, therefore, focus on how the new statutes and other relevant documents are applied, which can lead to the identification of different areas of democratic deficit and/or various ways to prevent it.

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Test-retest reliability of self-report instruments for measuring leisure activities in adults

Melisa Schneiderová[1,2,*], Josef Mana[1], Jiří Lukavský[1], Radek Trnka[1], Klára Daďová[1,2], Hana Georgi[1]

[1] Prague College of Psychosocial Studies, Prague, Czech Republic
[2] Charles University, Prague, Czech Republic
* Corresponding author: melissaschneiderova@seznam.cz

ABSTRACT

Leisure activities contribute to the preservation of physical and mental capabilities in aging. Measuring leisure pursuits with psychometrically sound instruments is essential to understand the specific relationships between different activities and health outcomes. This study aimed to examine the test-retest reliability of self-report instruments for measuring leisure activities in adults. The sample consisted of 86 healthy adult participants. Participants completed two assessments, three weeks apart, using the following instruments: 1) a single-question Attitude to Physical Activity scale (A2PA); 2) a modification of a COBRA questionnaire on recent engagement in physical and mental activities (SA-COBRA Cognitive and Physical); 3) scales measuring engagement in social/spiritual activities over the past two years from the standard Victoria Longitudinal Study – Activity Lifestyle Questionnaire (VLS-ALQ-S+). All instruments exhibited acceptable test-retest reliability, demonstrating their ability to reflect consistent patterns of lifestyle over time. This finding supports their suitability for assessing recent engagement in leisure activities.

KEYWORDS

physical activities; cognitive activities; social activities; questionnaire; public health

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INTRODUCTION

Leisure activities (LA) are defined as enjoyable pursuits undertaken during free time (Kleiber & Nimrod, 2009). A common categorization of LA is physical, cognitive, and social. Participation in LA has been consistently associated with a reduced risk of developing dementia or cognitive decline (Najar et al., 2019) and a higher perception of subjective happiness and life satisfaction (An et al., 2020). In particular, LA, along with other factors, such as educational attainment, and occupational demands, are believed to contribute to cognitive reserve (Alvares Pereira et al., 2022; Stern et al., 2020). It is a concept popularized by Yaakov Stern (2002) that describes the capability of the brain to cope with the consequences of changes or damage to the brain through pre-existing cognitive processes, which is crucial for healthy aging and may be a reason why some people keep excellent cognitive functions into old age. Cognitive reserve is cumulatively built over the course of life, with research continuously refining the factors that influence its development. In particular, engagement in physical activities has attracted a lot of attention as there is a growing evidence of their association with health including cognitive health in aging (Livingston et al., 2020). To reflect scientific evidence, the World Health Organization (WHO) issued physical activity recommendation for adults, which is to engage in moderate-intensity physical activity for at least 150 minutes (i.e. 2,5 hours) per week. Other guidelines add a recommendation of frequency of physical activity: at least three times a week (Izquierdo et al., 2021; U.S. Department of Health and Human Services, 2018).

Effectively investigating the impact of LA requires their measurement. To identify associations between LA and developmental changes, including aging, it is necessary to measure both retrospective and current engagement. Methods for measuring participation vary according to study objectives and time frames. The type and number of activities, frequency of participation, intensity, and duration are the most frequent measures used to assess engagement (Fallahpour et al., 2016). A brief overview of the most commonly used questionnaires focused on the main domains of LA is presented in Table 1 and elaborated further.

Few questionnaires document lifetime activities. Data on an individual's past are mostly acquired through self-reporting, as longitudinal studies are rare. The Historical Adulthood Physical Activity Questionnaire (HAPAQ) evaluates lifelong physical activity (Besson et al., 2010). The questionnaire is divided into two parts; the first examines activity over the last 15 years, and the second focuses on 10-year intervals from age 20 to the last 15 years. Each part includes closed questions on physical activity in the household, work, transportation, sports, and exercise. The HAPAQ shows acceptable validity (Besson et al., 2010), however, no study to date has investigated test-retest reliability. Another example is the Lifetime Physical Activity Questionnaire (LTPAQ) (Friedenreich et al., 1998), which estimates physical activity from childhood to the present. It focuses on frequency, duration, and intensity across occupational and volunteer activities, household tasks, and exercise/sports. Participants recall their first job (at least 8 hours/week for four months) and subsequent jobs, household tasks (at least 7 hours/week for four months), and exercise/sports activities (at least 2 hours/week for four months). The LTPAQ shows a high test-retest correlation after six to eight weeks (Friedenreich et al., 1998). However, most questionnaires evaluate

Table 1 Examples of leisure activity questionnaires

Source	Questionnaire	Activity type	Time frame	Test-retest reliability
Flora et al. (2023)	IPAQ	Physical	Over the past seven days	r = 0.71
Milton et al. (2010)	A single-item PA measure	Physical	Over the past week or past month	r = 0.72–0.82
Nevalainen et al. (2015)	COBRA	Physical, cognitive, social	Over the summer week	NA
Galvin et al. (2021)	CLAS	Physical, cognitive, social	Over the past year	NA
Jopp & Hertzog (2010)	VLS-ALQ	Physical, social, developmental, experiential activities, crafts, game playing, TV watching, travel, and technology use	Over the past two years	r = 0.65–0.70
Besson et al. (2010)	HAPAQ	Physical	Over the lifetime since age 20	NA
Friedenreich et al. (1998)	LTPAQ	Physical	Over the lifetime	r = 0.72–0.87

Note: HAPAQ = Historical Adulthood Physical Activity Questionnaire; LTPAQ = Lifetime Physical Activity Questionnaire; IPAQ = International Physical Activity Questionnaire; VLS-ALQ = Victoria Longitudinal Study – Lifestyle Activities Questionnaire; CLAS = Cognitive & Leisure Activity Scale; NA = Not available

current or recent participation in leisure activities over periods ranging from a few days to a year. The International Physical Activity Questionnaire (IPAQ) short form, for instance, focuses on the intensity and duration of physical activity over the past seven days (Craig et al., 2003). Single-item physical activity scales are also relevant; for example, Milton et al. (2011) developed one for screening physical activity over the past seven days or month: "In the past week/past month, on how many days have you done a total of 30 minutes or more of physical activity, which was enough to raise your breathing rate. This may include sport, exercise, and brisk walking or cycling for recreation or to get to and from places, but should not include housework or physical activity that may be part of your job."

Beyond physical activity, the Victoria Longitudinal Study (VLS) questionnaire by Hultsch et al. (1993) assesses various leisure activities, including physical, social, and self-maintenance. The original questionnaire included 70 activities, with participants rating their frequency on a Likert scale from (0) never to (9) daily. It has been modified for research purposes, such as in Jopp and Hertzog's (2010) version, which restructured 57 items into categories like physical, craft, gaming, television, social and private, social and public, religious, technology use, developmental, experiential, and travel, forming the Activity Lifestyle Questionnaire (VLS-ALQ). The VLS-ALQ demonstrated good test-retest reliability over 16 months, except for the 'Travel' scale, which had a lower correlation (r = 0.41) (Jopp & Hertzog, 2010). More recently, Galvin et al. (2021) developed the Cognitive & Leisure Activity Scale (CLAS), which focuses on participation in cognitive activities over the previous year. The scale consists of 16 items, for example, 'Playing cards or Board Games', 'Socializing with friends',

and so on. Participants are asked to indicate how often they engage in each activity on a scale ranging from 0 (never) to 5 (daily). So far, no studies have looked at test-retest reliability for the CLAS.

Measuring engagement in leisure activities in the Czech Republic

Several instruments are available to measure leisure activities among the adult population in the Czech Republic. Studies focusing on physical activity often utilize the IPAQ (e.g., Lojdová et al., 2021; Mitáš et al., 2014; Vašíčková et al., 2012). Broader studies on leisure activities typically employ custom questionnaires tailored to specific needs. For example, Frantál et al. (2020) developed a questionnaire for older adults that included a section assessing the frequency and duration of recent leisure activities during a typical day, both inside and outside the home, including part-time work. The Cognitive SuperAging Study (Heissler et al., 2021) used a questionnaire based on a Swedish study Cognition, Brain and Aging (COBRA), which included three sections – section A) consisted of 18 items related to cognitive activities (e.g., reading books), section B) included 19 items assessing physical activities (e.g., walking), and section C) included 10 items related to social activities (e.g., time spent with family members). In each section, respondents selected activities they engaged in during a typical summer week, indicating the number of days and hours spent on each (Nevalainen et al., 2015). Further, respondents assessed whether they performed the activity less, the same, or more than six years ago and rated the difficulty of each activity on a scale from (0) not at all difficult to (5) extremely difficult. The questionnaire was designed for the Swedish population thus some activities may not well apply to the Czech population (e.g., sailing).

To our knowledge, no standardized Czech leisure activity assessment tool has been developed to comprehensively evaluate adult's leisure participation across physical, cognitive, and social domains over an extended time frame. To address this gap, we adapted a set of instruments designed to measure long-term engagement in leisure activities encompassing these domains.

The instruments included: (1) the single-item Attitude to Physical Activity (A2PA) to evaluate attitudes towards physical activity throughout life, (2) the SA-COBRA-Cognitive and-Physical to assess long-term engagement in the respective leisure activities, and (3) VLS-ALQ-S+ to assess participation in social-public, social-private, and religious activities in last two years. The aim of this study is to examine the test-retest reliability of those self-report instruments.

METHODS

Participants and procedure

The participants were healthy adults with Czech as a native language, they were recruited and assessed by the psychology students who underwent a training in the methods administration.

The sample consisted of 86 adult participants (40 males, 41 females, and 5 not stated) with the mean age of 55.6 ± 10.6 ranging from 40 years to 83 years. Higher education (college or secondary school) was represented by 79 (91.8%) participants, while lower education (primary or vocational school) was represented by 7 (8.2%) participants.

The assessments were carried out in two waves during the fall of 2022, three weeks apart, in the form of structured interview. The assessment procedure included inquiry on basic demographic data and the questionnaires regarding leisure activities. All participants were fully informed prior to participation and provided an informed consent in accordance with the Declaration of Helsinki. The study and the methods were approved by the Prague College of Psychosocial Studies (PVSPS) Institutional Review Board (reg. No. 3/2022 and 3/2021).

Instruments

Attitude to Physical Activity scale (*A2PA*) is a single-question screening scale estimating attitude to and participation in physical activity over the life course: "What has been your relationship to sport and physical activity during adulthood, from the age of 20 until now?" The scale was designed for the COSACTIW study of life style and cognition in older age. Six categorical options were developed based on a discussion among the research team to assess positive implicit attitudes to physical activity throughout life course and whether the WHO (2020) criteria had been met. The A2PA was administered as a self-report questionnaire (see Appendix A).

SA-COBRA is a modification of a comprehensive questionnaire originally developed for the COBRA study (Nevalainen et al., 2015). The questionnaire was translated into Czech in collaboration with its author Nina Nevalainen through translation and back-translation process. It was designed to assess regular physical and cognitive activity. It was administered as a structured interview, but it can be administered also as a self-rating questionnaire.

- SA-COBRA-Cognitive scale was narrowed to eight cognitive activities most typical for Czech SA (Heissler et al., 2021). It includes questions on pre-set types of mental activities most common among SuperAgers in healthy Czech population, for example, "Using a computer for purposes other than gaming (i.e., including emailing, photo editing, Skype communication, etc.)" (Appendix B).
- SA-COBRA-Physical scale was modified not to include pre-set activities. Instead, respondents were asked to recall and name physical activities of vigorous intensity, moderate intensity and/or light intensity that they have typically performed within a typical summer week (Appendix C). The modification reflects the criteria of the World Health Organization for physical activity in adults (WHO, 2020).

Furthermore, in both SA-COBRA-Cognitive and – Physical, respondents are asked to specify the number of days and hours they dedicated to each activity per week. Additionally, they are asked to compare whether they performed the activity less, about the same, or more than six years ago and rate the subjective difficulty of performing the activity on a scale ranging from 1 (not at all difficult) to 5 (extremely difficult).

VLS-ALQ-S+ is an abridged version of an instrument assessing leisure activities VLS-ALQ developed by Jopp and Hertzog (2010). To assess social participation specifically, we used two scales: the 6-item social-public scale (e.g., "I invite friends to my house for dinner/lunch") and the 5-item social-private scale (e.g., "I volunteer"). Additionally, we included the item "I attend church services" from the religious scale as a measure of participation in religious activities. The questionnaire VLS-ALQ-S+ comprises 12 items, and the participants were asked to rate the frequency of their

engagement in each activity on a scale of 1 (never) to 9 (daily). The research team employed a collaborative translation process, followed by a meeting to discuss and reach consensus on a final translation.

The entire battery was pilot-tested with several functionally independent, cognitively healthy older adults to confirm clarity and comprehensibility before being used in this study.

Data analysis

A2PA

We presented responses to the A2PA scale using a contingency table, with wave 1 responses in rows and wave 2 in columns. To test for a presence of association between response frequencies across waves, we computed Pearson's χ^2 test of the null hypothesis that the joint distribution of the cell counts is the product of the row and column marginals. We estimated the test-retest reliability of A2PA via quadratically weighted Cohen's κ coefficient with values above.61 indicating substantial strength of agreement between waves (Landis & Koch, 1977).

SA-COBRA-Cognitive

First, we report the activities and means/medians of the corresponding responses in wave 1 to illustrate the nature of the responses that participants provided. To assess the test-retest reliability of the responses, we compared the data on total time using Pearson correlation coefficients. For frequency, subjective difficulty and subjective historical comparison, we report how often participants repeated their response in wave 2 exactly, and how often with minor deviations (+/–1).

SA-COBRA-Physical

Because SA-COBRA-Physical features open responses, we focused on the question of whether the total amount of self-reported activities could be considered sufficient according to the WHO guidelines ("at least 150–300 minutes of moderate-intensity aerobic physical activity; or at least 75–150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week, for substantial health benefits" (WHO, 2020, p. 32). Additionally, we analysed to what extent this self-reported adherence was reliable across Wave 1 and 2. We calculated the numbers of minutes spent in moderate-intensity and vigorous-intensity activities. Then, we compared these values with recommended thresholds (separately for lower and upper range values).

VLS-ALQ-S+

We described each VLS-ALQ-S+ scale and VLS-ALQ-S+ item scores by their means, medians and standard deviations separately for wave 1 and wave 2. To assess the test-retest reliability of scales and item responses we calculated Pearson and Spearman correlation coefficients of the wave 1 and wave 2 data. Values above 0.7 were considered acceptable while values above 0.8 were considered to represent good test-retest reliability. Furthermore, to test for systematic changes in data distributions between waves that can be missed via correlation analysis only, we compared means and signed ranks

of wave 1 and wave 2 data via paired t-test and Wilcoxon signed rank test respectively. Scales/item scores with p values less than 0.05 were considered statistically clearly different between waves. Finally, we assessed factor structure and internal consistency of VLS-ALQ-S+ total score as well as internal consistency of VLS-ALQ-S+ private and public scales separately in wave 1 and wave 2 via Confirmatory Factor Analysis (CFA) and Cronbach's α respectively. Two CFAs were fitted, one to data from each wave, consisting of three separate correlated factors for private, public and religious items. The single-item religious scale was modelled as a single-indicator latent variable with zero observed variable variance. Models' fit was evaluated via the χ^2 test, the Tucker Lewis Index (TLI), the Comparative Fit Index (CFI) and the root-mean-square-error-approximation (RMSEA) with values of TLI > 0.9, CFI > 0.9, and RMSEA < 0.08 considered to indicate adequate fit. Values of Cronbach's α above 0.7 were considered acceptable while values above 0.8 were considered to represent good internal consistency. All statistical analyses were performed using R (Version 4.3.3, R Core Team, Vienna, Austria).

RESULTS

A2PA

Response counts relating wave 1 responses (rows) to wave 2 responses (columns), are presented in Table 2. We observed a strong statistically clear association of response type counts ($\chi^2(25) = 93.171$, $p < 0.001$) with substantial agreement between waves ($\kappa = 0.706$, 95% CI [0.567, 0.846]).

Table 2 Response counts to the A2PA screening scale

	I'm an athletic person	I enjoy movement/ exercise	I exercised at least 3 times a week	I don't avoid movement/ exercise	I'm not an athletic person	I had to stop doing sports (Injury)
I'm an athletic person	6	1	0	0	1	0
I enjoy movement/ exercise	4	11	4	1	0	0
I exercised at least 3 times a week	1	4	12	2	1	0
I don't avoid movement/exercise	0	1	4	12	2	2
I'm not an athletic person	0	0	1	4	4	0
I had to stop doing sports (Injury)	0	0	0	1	0	0

SA-COBRA-Cognitive

The most commonly reported activity was 'Using a computer' (see Table 3). 'Using a computer', 'Reading books', 'Playing cards/games', and 'Art activities' were reported by at least half of the participants – the remaining activities were pursued only by a small part of the sample. On average, participants reported a similar level of engagement in activities as they did six years ago (48.8%). There was no apparent trend toward a decrease over time with people reporting "more" and "less" similarly often (24.7% vs 26.1%). Participants engaged in subjectively easy activities (rank 1 in 63.4%, 2 in 19.0%, 3 in 13.2%, 4 in 2.4%).

The reported hours per week was highly correlated across the Waves 1 and 2 ($r = 0.785$). The results are similar if we drop all zero responses ($r = 0.749$).

When reporting frequency per week, participants often used extreme responses (0×: 57.1%, 7×: 9.0% in Wave 1; 0×: 60.9%, 7×: 8.4% in Wave 2). Participants were considerably consistent in their use of extreme values – 90.8% of people who reported a zero in Wave 1 for a given activity, reported zero also in Wave 2. Similarly, 64.5% of people reporting the maximum frequency (7×) repeated their response in Wave 2. Altogether, 70.1% of responses were repeated exactly in Wave 2, 84.4% of responses differed only in +/−1.

When comparing their activities with the time six years ago, 68.3% used the same response with no apparent trend in under- or over-estimating (10.5% increased their response in Wave 2, 10.5% decreased the response, 10.8% missing response in Wave 2). People reported identical difficulty judgments in 54.9% of responses, in 72.5% the responses differed only in +/−1 (in 21.7% of cases, people did not report difficulty in Wave 2).

Table 3 Reported activities in Wave 1 sorted by the mean times per week frequency. The means and medians are calculated only after excluding the zero responses.

Activity	Reports		Times per week		Hours per week	
	Never	At least once	Median	Mean	Median	Mean
Using the computer not for games	20	66	6	5.2	9.0	9.0
Reading books	23	63	3	3.3	3.0	5.1
Playing a musical instrument or singing	70	16	3	3.1	2.5	3.5
Crosswords	55	31	2	2.8	2.0	3.1
Playing cards or board games	43	43	2	2.8	4.0	4.7
Art activity and handcraft	42	44	2	2.7	3.0	4.8
Riddles sudoku	65	21	2	2.4	1.0	2.4
Puzzle	75	11	1	1.9	2.0	3.2

SA-COBRA-Physical

The vast majority of the sample passed the WHO guidelines for the amount of physical activities (in Wave 1: 91.9% met the lower criteria threshold and 87.2% met the higher threshold). The results were similar in Wave 2 (84.9% and 76.7%, respectively). In 82.5%, the comparison with lower criteria threshold led to the same evaluation in both waves (i.e. passed in both, failed in both). Comparison with the higher threshold yielded the same evaluation in 76.7% cases.

VLS-ALQ-S+

Sample description, as well as difference statistics, are presented in Table 4. We did not observe any statistically significant differences between waves' means or signed ranks. The CFA model of the first wave data showed good fit to the data (χ^2 (52) = 63.138, p = 0.139, TLI = 0.919, CFI = 0.936, RMSEA = 0.050, 90% CI [0.000, 0.089]). On the other hand, the CFA model of the second wave did not reach level of adequate model fit (χ^2 (52) = 82.286, p = 0.005, TLI = 0.754, CFI = 0.806, RMSEA = 0.082, 90% CI [0.046, 0.115]). Across waves, the Social – Total scale had acceptable internal consistency (= 0.729, 95% CI [0.636, 0.806]; = 0.706, 95% CI [0.606, 0.790]) while the Social – Private (= 0.507, 95% CI [0.326, 0.652]; = 0.510, 95% CI [0.331, 0.655]) and Social – Public (= 0.689, 95% CI [0.571, 0.782]; = 0.683, 95% CI [0.563, 0.778]) scales had poor internal consistency.

The test-retest reliability estimates are presented in Figure 1. The overall Social – Total score scale had good test-retest reliability while test-retest reliability of Social – Private and Social – Public scales was acceptable. Regarding items scores, four items ("Volunteer", "Visit friends or relatives", "Talk to friend on phone", and "Attend organized social events") had poor test-retest reliability, five items ("Give dinner for friends", "Attend parties", "Eat out at restaurant", "Engage in political activities", and "Attend club meetings") had acceptable test-retest reliability and three items ("Attend church service", "Give public talk", and "Go out with friends") had good test-retest reliability.

Table 4 Descriptive and difference statistics of VLS-ALQ-S+ scales and item scores

Scale/Item	N	M ± SD	Md (IQR)	t-test	Wilcoxon test
Social – Total	79 / 82	45.53 ± 9.79 / 45.43 ± 9.61	42 (13) / 44 (13)	t(75) = –0.632, p = 0.529	V = 921.0, p = 0.863
Social – Private	82 / 83	33.20 ± 5.10 / 33.07 ± 5.40	34 (6) / 33 (7)	t(78) = –0.802, p = 0.425	V = 894.5, p = 0.716
Social – Public	84 / 85	10.80 ± 5.64 / 10.67 ± 5.76	9 (8) / 9 (8)	t(82) = –0.693, p = 0.490	V = 794.0, p = 0.798
Go out with friends	86 / 86	5.76 ± 1.56 / 5.62 ± 1.60	6 (2) / 5 (1)	t(85) = –1.536, p = 0.128	V = 219.0, p = 0.152
Visit friends or relatives	86 / 86	5.86 ± 1.64 / 5.84 ± 1.71	6 (2) / 6 (2)	t(85) = –0.167, p = 0.868	V = 470.0, p = 0.766

Scale/Item	N	M ± SD	Md (IQR)	t-test	Wilcoxon test
Attend parties (e.g., birthday)	86 / 86	4.49 ± 1.27 / 4.50 ± 1.43	4 (1) / 4 (1)	t(85) = 0.116, p = 0.908	V = 348.0, p = 0.810
Talk to friend on phone	84 / 85	7.99 ± 1.47 / 8.00 ± 1.48	8 (1) / 8 (1)	t(82) = 0.000, p = 1.000	V = 385.0, p = 0.607
Give dinner for friends	85 / 86	4.07 ± 2.00 / 3.99 ± 1.73	4 (3) / 4 (2)	t(84) = –0.323, p = 0.748	V = 330.0, p = 0.549
Eat out at restaurant	85 / 84	5.34 ± 1.69 / 5.21 ± 1.94	5 (3) / 5 (3)	t(82) = –0.560, p = 0.577	V = 324.0, p = 0.891
Engage in political activities	86 / 86	1.97 ± 1.54 / 1.83 ± 1.48	1 (2) / 1 (1)	t(85) = –1.228, p = 0.223	V = 105.5, p = 0.199
Give public talk	86 / 85	2.15 ± 2.12 / 2.21 ± 2.23	1 (2) / 1 (2)	t(84) = 0.472, p = 0.638	V = 68.5, p = 0.645
Attend club meetings	84 / 86	2.25 ± 1.88 / 2.26 ± 1.90	1 (3) / 1 (3)	t(83) = –0.453, p = 0.652	V = 111.0, p = 0.887
Attend organized social events	86 / 86	2.81 ± 1.52 / 2.63 ± 1.54	3 (3) / 2 (3)	t(85) = –1.085, p = 0.281	V = 456.5, p = 0.249
Volunteer	86 / 86	1.87 ± 1.62 / 1.90 ± 1.61	1 (1) / 1 (1)	t(85) = 0.168, p = 0.867	V = 125.0, p = 0.751
Attend church service	85 / 86	1.89 ± 1.82 / 1.94 ± 1.90	1 (1) / 1 (1)	t(84) = 0.000, p = 1.000	V = 36.5, p = 0.784

Note: M = Mean; SD = Standard Deviation; Md = Median; IQR = Interquartile range

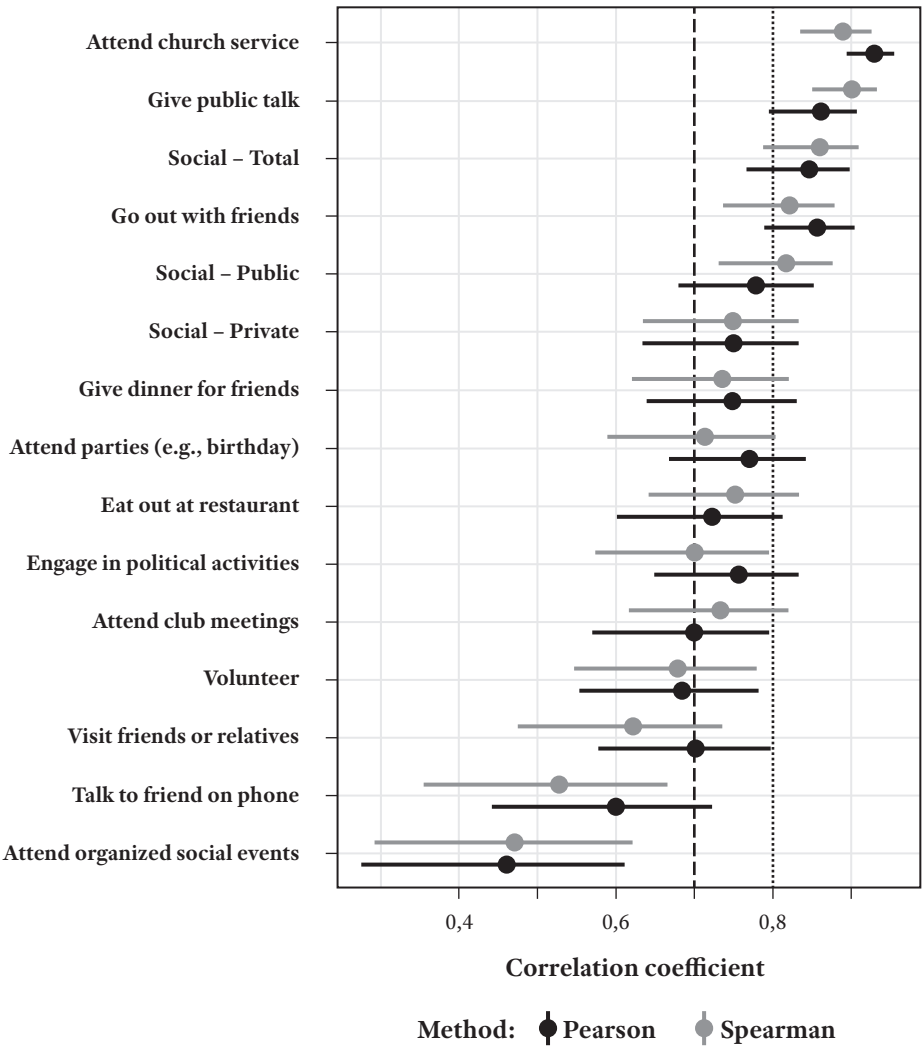

Figure 1 Test-retest reliability of VLS-ALQ-S+ scales and item scores

Note: Correlations above 0.7 were considered acceptable (dashed line).

DISCUSSION

This study aimed to evaluate the temporal stability, or test-retest reliability, of the leisure activity self-report instruments. Test-retest reliability is a critical psychometric aspect of measurement instruments, as it assesses their ability to provide consistent and accurate results over time. The findings revealed that the instruments showed acceptable test-retest reliability, suggesting their suitability for assessing individuals' leisure activities.

A2PA

A single-item screening scale exhibited a robust statistically significant association between response type counts across a 3-week interval. These findings indicate that the instrument consistently produces similar responses over time. Thus, we conclude that A2PA is reliable and can be used to assess one's attitude towards physical activity. Several studies have examined the reliability of single-item instruments for assessing physical activity, reporting high repeatability ICC = 0.75 (Scott et al., 2015) and strong correlations ranging from 0.82 to 0.88 (Li et al., 2000; Milton et al., 2011). Our results align with the established notion of test-retest reliability and compare favourably to previous findings.

SA-COBRA-Cognitive + Physical

The SA-COBRA is a modified questionnaire from the COBRA study (Nevalainen et al., 2015), and this study is the first to examine its reliability.

Regarding part Cognitive of the SA-COBRA questionnaire, the findings revealed no significant discrepancies between Wave 1 and Wave 2 responses. Participants consistently reported similar levels of cognitive activity in both waves. Moreover, their responses regarding their involvement in activities six years ago also remained stable, without any notable increases or decreases. Participants consistently reported similar frequencies of weekly activity participation throughout both waves. Furthermore, the reported hours of weekly activity involvement exhibited a high correlation across waves ($r = 0.785$). These findings indicate that the SA-COBRA questionnaire demonstrates consistency and reliability over time.

Regarding part Physical, since the responses were open, we focused on determining whether the total amount of self-reported activities met the criteria outlined in the WHO guidelines. The majority of our sample adhered to the WHO guidelines regarding the level of physical activity. In the first wave, 91.9% met the criteria for the lower threshold ("at least 150–300 minutes of moderate-intensity aerobic physical activity", and 87.2% met the criteria for the higher threshold ("at least 75–150 minutes of vigorous-intensity aerobic physical activity", (WHO, 2020). The findings were similar in the second wave, with 84.9% for lower and 76.7% for higher threshold. Consistency between waves was found in 82.5% of cases when compared to the lower threshold, and in 76.7% of cases when compared to the higher threshold. These results suggest that SA-COBRA-Physical is capable of accurately assessing adherence to the WHO physical activity guidelines.

VLS-ALQ-S+

The test-retest reliability analyses after a three-week interval revealed good overall reliability, with a correlation coefficient of 0.85 for the total scores. Individual scales also exhibited acceptable reliability, with the social-public scale demonstrating a correlation of 0.78 and the social-private scale of 0.75. These findings align with previous research by Jopp and Hertzog (2010), who reported similar values of 0.78 and 0.70 for the social-public and social-private scales, respectively.

Interestingly, the CFA revealed a good model fit for Wave 1 but a weaker fit for Wave 2. This disparity may be attributed to several factors, including potential measurement error. Despite this, the model still provides an adequate representation of

the data. Furthermore, our study found notably lower internal consistency values for the social-private scale, with a Cronbach's alpha of 0.51 in both the first and second waves. This contrasts with the higher consistency observed by Jopp and Hertzog, who reported alphas of 0.75 and 0.78 during the respective waves. Similarly, our social-public scale values were lower in the first wave ($\alpha = 0.69$) and higher in the second wave ($\alpha = 0.68$), deviating from Jopp and Hertzog's results ($\alpha = 0.75$ in the first wave; $\alpha = 0.61$ in the second wave).

Jopp and Hertzog employed a sample of 267 participants with a mean age of 49.58 ± 17.32 years, while our study involved 86 participants with a mean age of 55.6 ± 10.6 years. This notable discrepancy in sample size may have contributed to the weaker model fit in wave 2 and lower internal consistency in our study. Nevertheless, the VLS-ALQ-S+ instrument demonstrates acceptable reliability overall.

The instruments appear to be appropriate for assessing engagement in leisure activities over extended time frame. However, it is important to note that our testing primarily focused on reliability aspects, particularly through test-retest analysis. While test-retest reliability is considered a robust indicator of instrument stability, it is challenging to eliminate all sources of measurement error (Polit, 2014). For instance, despite employing a three-week interval between assessments, participants may exhibit response shifts due to reassessment of their internal beliefs (Sprangers & Schwartz, 1999) or experience memory inaccuracies (Frank et al., 2023). This could be particularly relevant for the A2PA scale, which assesses a person's general attitude towards physical activity. However, one-item scales, despite their simplicity, can provide valuable overall assessments of various aspects of one's life (Bowling, 2005).

Limitations and future research directions

This study acknowledges several limitations, the most significant of which is relatively small sample size. This limitation may have altered the accuracy of reliability assessments, particularly for the VLS-ALQ-S+ social-private scale, where weaker model fit in wave 2 and low internal consistency was observed. Furthermore, individuals with lower education levels were under-represented in our sample. Together with higher age, we could not claim the sample reflects the population structure, but it well represents the samples often used in aging studies. Notably, the higher homogeneity of the sample and consequent smaller range of responses could limit the observed reliability of the methods. Future research should address these limitations by using a larger sample size with a more diverse population. This would allow for more generalizable conclusions to be drawn and more accurate assessments of reliability to be made. In addition, future research would benefit from including more measures of reliability and validity. These measures would ensure that the instruments are assessed comprehensively.

CONCLUSION

This study assessed the test-retest reliability of the leisure activity instruments for adults (A2PA, SA-COBRA Cognitive + Physical, VLS-ALQ-S+). The results indicated adequate test-retest reliability for the instruments, suggesting their suitability for assessing leisure activity engagement. However, to comprehensively investigate

the impact of leisure activities on public health, it is crucial to include retrospective measures of engaging in leisure activities over life-course. Objective long-term data on lifestyle parameters are currently unavailable. Therefore, retrospective subjective methods remain essential for advancing knowledge in this area. Drawing generalizable conclusions from these methods requires understanding their parameters, such as retest reliability.

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APPENDIX A

A2PA

Attitude towards physical activity throughout life

What has been your attitude to sport and physical activity during your adult life, **from the age of 20** until now? **Select one answer.**

1. I am a very sporty person; I seek sports and physical activity. I am an active member of a sports club or organization (including a tourist organization), I used to play sports as an amateur. I certainly had at least three times a week of vigorous exercise (including brisk walking) and for at least 2.5 hours per week. Rather a lot more.
2. I like to move. I have had at least three times a week of vigorous exercise during my adult life, and I have often played sports for fun. I usually get more than 2.5 hours of exercise per week.
3. At least three times a week I had more intense movement, including brisk walking. I have had stretches of time when I did more sport.
4. I'm not a sporty person, but I don't shy away from exercise. I am not sure I can say that I have had at least three times a week of physical activity (including brisk walking) for most of my life and at least 2.5 hours of physical activity in total per week.
5. I am not a sporty person, I enjoy other things. I almost certainly did not have physical activities three times a week for a total of 2.5 hours per week.
6. I used to be an athlete, but due to an injury or illness I had to stop regular exercise. I miss sport. – If you choose this answer, please indicate in the following "Age" section by a number at what age you had to stop or significantly reduce your regular physical activity.
   Age .....

APPENDIX B

COBRA-Cognitive

Reflect on what your typical week looks like in the summer. How many hours per week do you usually spend on the listed activities? (circle the answer – the number representing the hours per week). **Over the past 6 years, has this amount of time remained approximately the same, or is it now more or less than before?** (mark the appropriate column with an X). **How challenging are these activities for you usually?** (circle: 1: not challenging at all – 5: extremely challenging/don't know). *For each intensity, ask for the specific activities the participant engages in and all the details.*

Activity	Times p/w	Hours p/w	Now less (0)	Same (1)	Now more (2)	Difficulty	Don't know (0)
Computer use for non-gaming purposes (including writing emails, editing photos, communicating via Skype, etc.)?		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
Reading fiction?		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
Crosswords?		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
Solving quizzes, Sudoku, etc.?		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
Assembling puzzles (e.g., jigsaw puzzles)?		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
Art activities or handwork?		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
Playing card or board games?		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
Playing a musical instrument or singing?		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
Other:		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0

APPENDIX C

COBRA-Physical

Reflect on what your typical week looks like in the summer. How many times per week do you engage in any activity of the described intensity for at least 10 minutes? (write down the number). **How many hours per week do you usually spend on the listed activities?** (circle the answer – the number representing the hours per week). **Over the past 6 years, has this amount of time remained approximately the same, or is it now more or less than before?** (mark the appropriate column with an X). **How physically challenging are these activities for you usually?** (circle: 1: not challenging at all – 5: extremely challenging/don't know). *For each intensity, ask for the specific activities the participant engages in and all the details.*

Activity	Times p/w	Hours p/w	Now less (0)	Same (1)	Now more (2)	Difficulty	Don't know (0)
VERY INTENSE physical activity – rapid heartbeat, sweating, unable to speak fluently during it. E.g. running or very fast walking, aerobics, intense swimming, cycling uphill or fast, etc.							
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
MODERATE INTENSITY physical activity – accelerated heartbeat, light sweating, able to speak fluently. E.g. brisk walking, tennis doubles, leisure cycling, yoga, volleyball, badminton, light swimming, or intensive gardening, etc.							
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0

LIGHT physical activity – no sweating, able to sing during it. E.g. slow walking, stretching, bowling, pétanque, light housework or gardening, etc.							
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+				1 2 3 4 5	0

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Evaluating football clubs using ORESTE and AGREPREF

Veronika Krause

Department of Sport Management, Faculty of Physical Education and Sport, Charles University, Prague, Czech Republic
veronika.krause@ftvs.cuni.cz

ABSTRACT

In already published research, we observe that continuous multi-criteria decision-making models are often used to evaluate professional football clubs. However, some publications suggest that discrete models can also be applied. The aims of this study are to assess English Premier League clubs using two discrete multi-criteria evaluation methods and to compare their results. The chosen methods were ORESTE, which is based on an ordinal comparison of criteria and alternatives, and AGREPREF, which relies on pairwise comparisons. Six criteria were selected to represent the sporting, economic, and social objectives of the clubs. Both methods produced only a quasi-arrangement of clubs. The AGREPREF method provided a ranking more closely aligned with the clubs' final league positions. However, the final ranking is significantly influenced by the selection of criteria and the weights assigned to them. Both methods highlighted the performances of Wolverhampton Wanderers and Watford.

KEYWORDS

decision-making methods; Premier League; performance

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INTRODUCTION

European football is a major industry with distinctive characteristics. First, European professional football clubs tend to focus on utility maximization rather than profit maximization (Avgerinou, 2007; Kesenne, 2000). Another unique characteristic is the environment in which the clubs operate. The top European competitions can be considered cartels (Kesenne, 2003), as the clubs, despite competing against each other, must collaborate on various issues to ensure the league season takes place, including certain revenue-sharing agreements.

In recent years, the decision-making process in professional clubs has been highly influenced by the UEFA (Union of European Football Associations) regulations, which were designed to ensure the financial sustainability of clubs, to prevent insolvencies, and to promote competitive balance. As some researchers expected (Peeters & Szymanski, 2014), the regulations do not resolve all these issues (Caglio, Laffitte, Masciandaro, & Ottaviano, 2023). Also, UEFA has reacted to the latest developments and has changed the rules (UEFA, 2023).

Also, for these reasons, many researchers are attempting to evaluate the overall performance of football clubs. However, there is no scientific consensus on how to approach this problem. The scientists do not agree on what areas to evaluate. A professional football club achieves three types of goals – sporting, economic, and social (Freyer, 1991). These goals are interconnected and influence one another (Šíma, 2019).

The sporting goal is typically linked to performance in the domestic league and the domestic and European cups. However, it can also represent the development of young players. The economic goal is represented by the financial stability of the club to secure future growth. The social goal relates to expanding the fan base, enhancing the club's image, and engaging in corporate social responsibility (CSR) activities (Čáslavová, 2009; Šíma, 2019).

According to the complexity of a club's goals, selecting the most suitable variables to represent its performance for a single season is challenging. Many researchers have decided to evaluate only sporting performance (Beck & Meyer, 2012; Dawson & Dobson, 2002; García-Sánchez, 2007). Others have focused exclusively on evaluating economic performance (Barros & Garcia-del-Barrio, 2008; Forker, 2005).

There is already a large group of researchers who have focused both on sporting and economic goals (Badmus, Akinwande, & Ukaegbu, 2017; Barros & Douvis, 2009; Carmichael, McHale, & Thomas, 2011; Guzmán & Morrow, 2007; Haas, 2003), but only a few authors have decided to evaluate complex performance by including the social goal (Šíma, Voráček, Kraft, & Krause, 2023; Zambom-Ferraresi, Lera-López, & Iráizoz, 2017). Authors who evaluate more objectives tend to use the data envelopment analysis (DEA) to evaluate the clubs' performance.

The DEA is a multi-criteria decision-making method based on linear programming, first introduced by Charnes, Cooper, & Rhodes (1978). It measures performance in terms of efficiency. Given that DEA is based on linear programming and is therefore a continuous model, the question arises of whether a discrete multi-criteria decision model could be used to evaluate clubs.

In recent decades, several multi-criteria decision-making methods have been invented (Triantaphyllou, 2010) and are now used to make decisions across various industries These methods can be applied to analyze location planning for urban distribution centres amid uncertainty, evaluate suppliers in supply chain management, or assess banking performance based on a balanced scorecard (Aruldoss, Lakshmi, & Venkatesan, 2013).

The discrete multi-criteria decision-making methods can also be used to evaluate corporate entities and organizations. Thus, the decision-making unit is influenced by numerous factors, making the assessment of its performance multidimensional. Evaluation through a discrete multi-criteria decision-making method can help to recognize

its strengths and weaknesses and to increase its performance through management changes (Zopounidis & Doumpos, 2002).

To provide specific examples of the use of multi-criteria decision-making methods in business, several concrete cases will be mentioned. The first example is the application of these methods to solve the problem of optimal portfolio selection for securities Marasović & Babić (2011) employed a model based on PROMETHEE II (Preference ranking organization method for enrichment evaluation), structuring the methodology around two interconnected pillars: the selection of different industries to form the overall portfolio and the selection of a portfolio for each industry individually. Additionally, the authors defined specific forms of criterion functions for each criterion.

Another example of the practical application of multi-criteria decision-making methods is supplier selection. Adali & Isik (2017) performed a web designer selection based on ORESTE (Organization, Rangement Et Synthese De Donnes Relationnelles) method and a set of seven criteria affecting their selection decision as price, technical skills, communication skills, reference, time, experience and technical support. According to Chatterjee & Chakraborty (2013) the ORESTE method might be also used to select of advanced manufacturing systems.

Čabala & Jadlovský (2017) demonstrated, using the ELECTRE III (ELimination Et Choix Traduisant la REaite), TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution), and AGREPREF (AGgREgation PREFerences) methods, that these approaches can be applied to find the optimal configuration of an automated assembly line model. They also recommend using multiple methods for evaluating alternatives when addressing significant problems and comparing the results obtained from each method. Olivková (2017) demonstrated, that the AGREPREF method might be also used to compare and evaluate fare collection technologies in the public transportation. From the above, it is evident that multi-criteria decision-making methods have a remarkably wide range of potential applications.

This wide range of potential applications also includes the sport environment because professional sport is a business. Górecka (2020) presented an approach that could be used by a company to select the best football club to sponsor. The selection was based on EXPROM IIv (EXtension of the PROMethee), PROMETHEE IIv, ELECTRE III, and TOPSIS, and the criteria represented all three major goals of a football club – sporting, economic, and social. Like Čabala & Jadlovský (2017), she also recommends using multiple methods for evaluating alternatives.

Another potential application in the sports environment might be the selection of the best football player, the Golden Ball Award. As research has shown, the winner selected using discrete multi-criteria decision-making method AHP (Analytical Hierarchy Process) may differ dramatically from the winner ultimately selected by the judges (Mu, 2016).

Returning to the evaluation of football clubs, there are only a few approaches that use a discrete multi-criteria decision-making model. One example comes from Greek football (Chelmis, Niklis, Baourakis, & Zopounidis, 2019). Using the PROMETHEE II method and a set of 38 criteria, which represented all three goals of a football club, this approach was very comprehensive. On the other hand, such a large set of criteria complicates their actual use by the governing sports organizations.

In a study evaluating German football clubs, only six criteria were used with two different discrete multi-criteria decision-making methods, AHP and TOPSIS (Mavi, R., Mavi, N., & Kiani, 2012). The six selected criteria represented only the economic and social goals, as the sporting performance of the club was not included.

It is difficult to decide whether discrete multi-criteria decision-making methods are better than a continuous one, and which exact method to use to evaluate football clubs. There is not enough evidence that discrete multi-criteria decision-making methods might be more accurate and usable. The scientific community also disagrees on which criteria should be selected to represent a club's complex performance in a way that is not overly complicated to apply.

Therefore, the aim of this article is to evaluate the performance in achieving the sporting, financial, and social goals of football clubs using two multi-criteria decision-making methods that are not commonly employed for this purpose.

METHODS AND DATA

Both selected multi-criteria decision-making methods are quite common in other business fields, but not for evaluating football clubs. The ORESTE and AGREPREF methods were chosen because they require minimal additional information, only the order/weights of criteria. The calculations are based on the procedure described in Fiala (2013).

The ORESTE method is based on ordinal information about inputs and criteria. Since the existence of indifferent criteria and alternatives is allowed, it is a quasi-arrangement. The quasi-arrangement of criteria is expressed as a vector q, and the quasi-arrangement of inputs as a matrix P.

$$q = (q_1, q_2, ..., q_k) \tag{1}$$

$$P = (p_{ij}),\ i = 1, 2, ..., p, j = 1, 2, ..., k. \tag{2}$$

Then the distance from the fictitious origin is calculated according to the following formula:

$$D = (d_{ij}),\ i = 1, 2, ..., p, j = 1, 2, ..., k, \tag{3}$$

$$d_{ij} = \left(\tfrac{1}{2}(p_{ij})^r + \tfrac{1}{2}(q_j)^r\right)^{1/r},\ r = 3. \tag{4}$$

The distances d_{ij} are arranged in ascending order and rated by an ordinal number in the matrix R. After that, we can calculate the line of sums r_i in the matrix. By arranging these values in ascending order, we obtain a quasi-ordering of alternatives.

$$R = (r_{ij}),\ i = 1, 2, ..., p, j = 1, 2, ..., k. \tag{5}$$

$$r_i = \sum_{j=1}^{k} r_{ij},\ i = 1, 2, ..., p. \tag{6}$$

Based on the values of r_{ij} we can calculate the values of the preference intensities c_{mn}.

$$c_{mn} = \sum_{h \in K}(r_{nh} - r_{mh}),\ m, n = 1, 2, ..., p, \tag{7}$$

where K represents the set of indices of criteria in terms of which alternative a_m is better than alternative a_n. These preference intensities are normalized and used to identify the relations of preferences, indifferences and incomparability.

$$c^*_{mn} = \frac{c_{mn}}{c^{max}},\ m, n = 1, 2, ..., p, \tag{8}$$

$$c^{max} = k^2(p - 1). \tag{9}$$

To identify the relations, the thresholds α, β, and γ were chosen as follows:

$$\alpha = 0.0263 \tag{10}$$

$$\beta = 0.00877 \tag{11}$$

$$\gamma = 1. \tag{12}$$

The thresholds were chosen according to the recommended maximum or minimum threshold values as suggested by Fiala (2013) to make the sensitivity analysis less strict when evaluating individual relationships. At the same time, this minimizes the subjective perspective of a single author. In order to perform the last two steps of the analysis, we need to assume the following relation:

$$c^*_{mn} \geq c^*_{nm}. \tag{13}$$

If the following holds, the alternatives a_m and a_n are mutually indifferent.

$$c^*_{mn} \leq \alpha, \text{ and } c^*_{mn} - c^*_{nm} \leq \beta. \tag{14}$$

In another case, we can observe a preference relation or incomparability. If the following equation holds, the alternatives a_m and a_n are incomparable. Otherwise, alternative a_m is preferred to alternative a_n.

$$\frac{c^*_{nm}}{c^*_{mn} - c^*_{nm}} \geq \gamma. \tag{15}$$

The results from the ORESTE method are based on the r_i value and the analysis of preference intensities.

The AGREPREF method is based on pairwise comparisons of preference according to individual criteria. For the set of alternatives $A = \{a_1, a_2, ..., a_p\}$ and the system of criteria $f_1, f_2, ..., f_k$, we can define the degree of preference for alternative a_m over a_n

$$s_{mn} \in < 0,1 >. \tag{16}$$

The importance of each criterion is defined by the weights:

$$v_1, v_2, ..., v_k, \sum_{h=1}^{k} v_h = 1, v_h \geq 0. \quad (17)$$

For each pair of alternatives a_m and a_n, we group the criteria as follows

- The set of indexes I_{mn} in case a_m is preferred to alternative a_n,
- The set of indexes I_{nm} in case a_n is preferred to alternative a_m,
- The set of indexes $I_{m\sim n}$ in case that both alternatives have the same values of the criterion and have an indifferent relation.

The degrees of preference s_{mn} (for a_m preferred to a_n), s_{nm} (for a_n preferred to a_m), and indifferences $s_{m\sim n}$ (for indifference between a_m and a_n) are calculated:

$$s_{mn} = \sum_{h \in mn} v_h, \quad (18)$$

$$s_{mn} = \sum_{h \in I_{nm}} v_h, \quad (19)$$

$$s_{m\sim n} = \sum_{h \in I_{m\sim n}} v_h. \quad (20)$$

The final relation between the pair of alternatives is determined based on thresholds α and β, which were chosen as follows:

$$\alpha = 0.5\,, \quad (21)$$

$$\beta = 0.2. \quad (22)$$

The thresholds were chosen by the author to balance sensitivity and robustness in the decision-making process. This setting allows for identifying indifference when alternatives have moderate similarity while ensuring preference is determined even with small but meaningful differences.

If this is the case, the following equation holds, as there is an indifferent relation between alternatives a_m and a_n. If not, then we can observe a relation of preference or incomparability.

$$s_{m\sim n} \geq \alpha. \quad (23)$$

The alternative a_m is preferred to alternative a_n, if:

$$s_{mn} - s_{nm} > \beta. \quad (24)$$

The alternative a_n is preferred to alternative a_m, if:

$$s_{nm} - s_{mn} > \beta. \quad (25)$$

If none of these last three equations holds, then there is a relation of incomparability between those alternatives.

The calculated relations between all pairs of alternatives are transferred to the matrix P. The value p_{mn} is equal to 1, if alternative a_m is preferred to a_n. If alternative a_m is not preferred to a_n, the value p_{mn} is equal to 0. The matrix P is subsequently rearranged so that the upper right corners have ones, which creates a quasi-arrangement of alternatives. To arrange the matrix P, we use the values d_h.

$$d_h = d_h^+ - d_h^-, \text{ where } d_h^+ = \sum_{n=1}^{p} p_{hn}, \; d_h^- = \sum_{m=1}^{p} p_{mh}. \tag{26}$$

The set of alternatives for both methods consists of all Premier League clubs from the 2018/2019 season, meaning there are 20 alternatives. The set of criteria was chosen based on inputs and outputs from Badmus et al. (2017) and Šíma et al. (2023). A total of six criteria were selected, three minimizing and three maximizing – the number of points obtained in the league (points), total revenue (rev), change in the number of fans on Facebook (fans), total wages (wage), the number of employees (employ), and assets consumed (assets). Each criterion was evaluated with points b from 1 to 20 according to its importance. From these points, the weights v were calculated as follows:

$$v_j = \frac{b_j}{\sum_{j=1}^{k} b_j}, j = 1, 2, ..., k. \tag{27}$$

The final weights and order of selected criteria are presented in Table 1. The sports performance in the season fundamentally influences the flow of finances in the following years and thus the club's possibilities on the transfer market. As a result, the number of points was selected as the most important criterion. The second most important criterion is the total amount of the club's revenue, followed by total wages in third place. These represent the economic goal and sustainable management. On the other hand, the number of employees can vary due to various factors, which is why the weight of this criterion is the lowest.

Table 1 Criteria ranking (Source: Own research)

Criterion	Points	Rev	Fans	Wage	Employ	Assets
Order	1	2	5	3	6	4
Points	20	18	10	16	4	12
Weight	0.25	0.225	0.125	0.2	0.05	0.15
Type	max	max	max	min	min	min

The actual data come mostly from the clubs' financial statements, while the full data set (Table 2) is from Krause (2022).

Table 2 Data set (Source: Krause, 2022)

	Points	Rev	Fans	Wage	Employ	Assets
Manchester City	98	535 169 000	6 173 000	315 257 000	463	140 206 000
Liverpool	97	533 022 000	4 670 000	309 917 000	853	122 939 000
Chelsea	72	423 637 000	224 000	262 795 000	409	173 777 000
Tottenham Hotspur	71	460 695 000	2 218 000	178 602 000	561	72 365 000
Arsenal	70	367 459 000	−191 000	230 463 000	707	96 164 000
Manchester United	66	601 935 000	−440 000	324 004 000	816	135 373 000
Wolverhampton Wanderers	57	172 463 000	745 000	92 131 000	365	38 859 000
Everton	54	187 664 000	73 000	159 985 000	456	104 105 000
Leicester City	52	178 429 000	52 000	149 512 000	320	67 474 000
West Ham United	52	190 695 000	14 000	135 796 000	542	59 432 000
Watford	50	147 661 000	717 000	83 599 000	297	40 524 000
Crystal Palace	49	155 404 000	65 000	119 295 000	236	54 905 000
Newcastle United	45	176 448 000	39 000	96 798 000	274	41 428 000
Bournemouth	45	131 134 000	46 000	110 894 000	621	37 544 000
Burnley	40	137 791 000	22 000	86 619 000	255	38 755 000
Southampton	39	144 649 000	510 000	111 444 000	385	55 301 000
Brighton and Hove Albion	36	143 132 000	66 000	100 581 000	954	34 473 000
Cardiff City	34	122 574 000	8 000	53 651 000	190	29 368 000
Fulham	26	137 748 000	30 000	92 591 000	273	44 550 000
Huddersfield Town	16	119 320 000	12 000	64 175 000	303	33 373 000

Note: Revenues, wages, and assets are listed in British pounds

RESULTS

First, the results calculated using the ORESTE method will be presented. The matrix R, which represents the average ranking based on alternatives and criteria, is shown in Table 3.

The final evaluation of the clubs according to ORESTE is shown in Table 4, along with their final positions in the Premier League season for comparison. The ranking from the R matrix is complete. However, based on the results of the preference analysis in Table 6, several alternatives were detected that are not comparable to each other. As a result, we only obtain the final quasi-arrangement of the clubs.

The football club with the best performance was Wolverhampton Wanderers, while the club with the worst performance was Manchester United. Both Manchester United and Arsenal finished at the top of the league, but their overall performance was the

Table 3 R matrix (Source: Own Research)

	Points	Rev	Fans	Wage	Employ	Assets	Sum	Rank
Manchester City	1	4	16.5	111	77	112	321.5	4
Liverpool	2.5	7.5	19.5	105	114	100	348.5	8
Chelsea	5.5	19.5	41	99	66	118	349	9
Tottenham Hotspur	10.5	12.5	21.5	87	90	82	303.5	3
Arsenal	16.5	27.5	113	93	102	88	440	19
Manchester United	25.5	2.5	119	117	108	106	478	20
Wolverhampton Wanderers	36	62	23.5	21.5	55	32.5	230.5	1
Everton	42	43	47	81	72	94	379	12
Leicester City	53.5	49	65	74	48	75	364.5	11
West Ham United	53.5	37	95	69	84	70	408.5	16
Watford	61	73	31	9	40	39	253	2
Crystal Palace	67	68	59	63	27.5	58	342.5	7
Newcastle United	78.5	56	76	38	34.5	46	329	5
Bournemouth	78.5	104	71	50	96	18	417.5	18
Burnley	85	92	89	14.5	29.5	23.5	333.5	6
Southampton	91	80	34.5	57	60	64	386.5	13
Brighton and Hove Albion	97	86	52	44	120	14.5	413.5	17
Cardiff City	103	110	107	5.5	25.5	10.5	361.5	10
Fulham	109	98	83	29.5	32.5	51	403	15
Huddersfield Town	115	116	101	7.5	45	12.5	397	14

weakest. Their poor performance is linked to high wages, large staff numbers, and the fact that both clubs lost fans on Facebook during the period under review.

Although Wolverhampton and Watford finished the season around mid-table, they were rated as the best-performing clubs by the ORESTE method. This is due to their low staff costs, low numbers of staff, and the low amount of assets consumed. Watford had the third-lowest total wage bill in the league.

The AGREPREG method revealed different results. In Table 7, there is the final *P* matrix, which was compiled based on values from the preference matrix (Table 5) and indifference matrix. As we can observe, ones still occur below the diagonal even after ordering by d values, indicating a cycle that implies a complete ordering of the alternatives. Also, the occurrence of zeros above the diagonal is a sign that the arrangement will not be complete, because there is an indifference or incomparability relation between some alternatives. The final quasi-arrangement of clubs is shown in Table 8.

Table 4 Final rank according to ORESTE (Source: Own research)

	Rank in the league	Rank in R matrix	Final rank ORESTE
Manchester City	1	4	4
Liverpool	2	8	7–9
Chelsea	3	9	7–9
Tottenham Hotspur	4	3	3
Arsenal	5	19	19
Manchester United	6	20	20
Wolverhampton Wanderers	7	1	1
Everton	8	12	10–12
Leicester City	9	11	10–12
West Ham United	10	16	16
Watford	11	2	2
Crystal Palace	12	7	7–9
Newcastle United	13	5	5
Bournemouth	14	18	17–18
Burnley	15	6	6
Southampton	16	13	13
Brighton and Hove Albion	17	17	17–18
Cardiff City	18	10	10–12
Fulham	19	15	15
Huddersfield Town	20	14	14

Table 5 Preference Table – AGREPREF (Source: Own Research)

	ManC	Liv	Chel	TotH	Ars	ManU	Wolv	Eve	Leic	WHU	Wat	CrP	NU	Bou	Burn	Sou	Bri	CaC	Ful	Hud
Manchester City		0.65	0.75	0.65	0.65	0.625	0.6	0.6	0.6	0.65	0.6	0.6	0.6	0.65	0.6	0.6	0.65	0.6	0.6	0.6
Liverpool	0.35		0.75	0.6	0.6	0.725	0.6	0.6	0.6	0.475	0.6	0.6	0.6	0.6	0.6	0.6	0.65	0.6	0.6	0.6
Chelsea	0.25	0.25		0.3	0.65	0.625	0.475	0.65	0.6	0.65	0.475	0.6	0.6	0.525	0.6	0.475	0.65	0.6	0.6	0.6
Tottenham Hotspur	0.35	0.4	0.7		1	0.775	0.6	0.75	0.6	0.6	0.6	0.6	0.6	0.65	0.6	0.6	0.65	0.6	0.6	0.6
Arsenal	0.35	0.4	0.35	0		0.775	0.475	0.625	0.475	0.475	0.475	0.475	0.475	0.475	0.475	0.475	0.525	0.475	0.475	0.475
Manchester United	0.375	0.275	0.375	0.225	0.225		0.475	0.475	0.475	0.475	0.475	0.475	0.475	0.475	0.475	0.475	0.525	0.475	0.475	0.475
Wolverhampton Wanderers	0.4	0.4	0.525	0.4	0.525	0.525		0.775	0.725	0.775	0.75	0.95	0.725	0.85	0.6	1	0.6	0.6	0.95	0.6
Everton	0.4	0.4	0.35	0.25	0.375	0.525	0.225		0.6	0.425	0.475	0.6	0.6	0.65	0.6	0.475	0.65	0.6	0.6	0.6
Leicester City	0.4	0.4	0.4	0.4	0.525	0.525	0.275	0.4		0.175	0.475	0.475	0.6	0.65	0.6	0.525	0.525	0.6	0.6	0.6
West Ham United	0.35	0.525	0.35	0.4	0.525	0.525	0.225	0.575	0.575		0.475	0.475	0.475	0.525	0.475	0.475	0.525	0.6	0.475	0.6
Watford	0.4	0.4	0.525	0.4	0.525	0.525	0.25	0.525	0.525	0.525		0.725	0.725	0.85	0.8	1	0.85	0.6	0.95	0.65
Crystal Palace	0.4	0.4	0.4	0.4	0.525	0.525	0.05	0.4	0.525	0.525	0.275		0.425	0.65	0.65	0.675	0.525	0.6	0.65	0.65
Newcastle United	0.4	0.4	0.4	0.4	0.525	0.525	0.275	0.4	0.4	0.525	0.275	0.575		0.475	0.6	0.875	0.725	0.6	0.75	0.65
Bournemouth	0.35	0.4	0.475	0.35	0.525	0.525	0.15	0.35	0.35	0.475	0.15	0.35	0.275		0.525	0.6	0.3	0.6	0.75	0.6
Burnley	0.4	0.4	0.4	0.4	0.525	0.525	0.4	0.4	0.4	0.525	0.2	0.35	0.4	0.475		0.65	0.5	0.6	0.875	0.65
Southampton	0.4	0.4	0.525	0.4	0.525	0.525	0	0.525	0.475	0.525	0	0.325	0.125	0.4	0.35		0.65	0.6	0.6	0.6
Brighton and Hove Albion	0.35	0.35	0.35	0.35	0.475	0.475	0.4	0.35	0.475	0.475	0.15	0.475	0.275	0.7	0.5	0.35		0.6	0.75	0.6
Cardiff City	0.4	0.4	0.4	0.4	0.525	0.525	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		0.65	0.875
Fulham	0.4	0.4	0.4	0.4	0.525	0.525	0.05	0.4	0.4	0.525	0.05	0.35	0.25	0.25	0.125	0.4	0.25	0.35		0.65
Huddersfield Town	0.4	0.4	0.4	0.4	0.525	0.525	0.4	0.4	0.4	0.4	0.35	0.35	0.35	0.4	0.35	0.4	0.4	0.125	0.35	

Table 6 Preferance analysis matrix – ORESTE (Source: Own research)

	ManC	Liv	Chel	TotH	Ars	ManU	Wolv	Eve	Leic	WHU	Wat	CrP	NU	Bou	Burn	Sou	Bri	CaC	Ful	Hud
Manchester City	I	>	>	N	>	>	<	>	>	>	<	N	N	>	N	>	>	N	>	>
Liverpool	<	I	N	<	>	>	<	>	N	>	<	N	N	>	N	>	>	N	>	>
Chelsea	<	N	I	<	>	>	<	>	>	>	<	N	N	>	N	>	>	N	>	>
Tottenham Hotspur	N	>	>	I	>	>	<	>	>	>	<	>	>	>	N	>	>	>	>	>
Arsenal	<	<	<	<	I	>	<	<	<	<	<	<	<	N	<	<	<	<	<	<
Manchester United	<	<	<	<	<	I	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Wolverhampton Wanderers	>	>	>	>	>	>	I	>	>	>	>	>	>	>	>	>	>	>	>	>
Everton	<	<	<	<	>	>	<	I	<	>	<	<	<	>	<	N	>	N	>	N
Leicester City	<	N	<	<	>	>	<	>	I	>	<	<	<	>	<	>	>	N	>	>
West Ham United	<	<	<	<	>	>	<	<	<	I	<	<	<	N	<	<	N	<	N	N
Watford	>	>	>	>	>	>	<	>	>	>	I	>	>	>	>	>	>	>	>	>
Crystal Palace	N	N	N	<	>	>	<	>	>	>	<	I	<	<	N	>	>	>	>	>
Newcastle United	N	N	N	<	>	>	<	>	>	>	<	>	I	>	N	>	>	>	>	>
Bournemouth	<	<	<	<	N	>	<	<	<	N	<	>	<	I	<	<	N	<	<	<
Burnley	N	N	N	N	>	>	<	>	>	>	<	N	N	>	I	>	>	>	>	>
Southampton	<	<	<	<	>	>	<	N	<	>	<	<	<	>	<	I	>	<	>	N
Brighton and Hove Albion	<	<	<	<	>	>	<	<	<	N	<	<	<	N	<	<	I	<	N	<
Cardiff City	N	N	N	<	>	>	<	N	N	>	<	<	<	>	<	>	>	I	>	>
Fulham	<	<	<	<	>	>	<	<	<	N	<	<	<	>	<	<	N	<	I	N
Huddersfield Town	<	<	<	<	>	>	<	N	<	N	<	<	<	>	<	N	>	<	N	I

Explanatory: I = indifference, N = incomparable

Table 7 P matrix – AGREPREF (Source: Own research)

	ManC	Liv	TotH	Wolv	Chel	Wat	Eve	WHU	Leic	NU	CrP	Ars	Sou	Bri	ManU	Bou	Burn	CaC	Ful	Hud
Manchester City		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Liverpool	0		1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Tottenham Hotspur	0	0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wolverhampton Wanderers	0	0	0		0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1
Chelsea	0	0	0	0		0	1	1	1	1	1	1	0	1	1	0	1	1	1	1
Watford	0	0	0	0	0		0	0	0	1	1	0	0	1	0	1	1	1	1	1
Everton	0	0	0	0	0	0		0	1	1	1	0	0	1	0	1	1	1	1	1
West Ham United	0	0	0	0	0	0	0		1	0	0	0	0	0	0	0	0	1	0	1
Leicester City	0	0	0	0	0	0	0	0		1	0	0	0	0	0	1	1	1	1	1
Newcastle United	0	0	0	0	0	0	0	0	0		0	0	1	1	0	1	1	1	1	1
Crystal Palace	0	0	0	0	0	0	0	0	0	0		0	1	0	0	1	1	1	1	1
Arsenal	0	0	0	0	0	0	1	0	0	0	0		0	0	1	0	0	0	0	0
Southampton	0	0	0	0	0	0	0	0	0	0	0	0		1	0	0	0	1	1	1
Brighton and Hove Albion	0	0	0	0	0	0	0	0	0	0	0	0	0		0	1	0	1	1	1
Manchester United	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
Bournemouth	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0		0	1	1	1
Burnley	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0		1	1	1
Cardiff City	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		1	1
Fulham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		1
Huddersfield Town	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Table 8 Final Evaluation according to AGREPREF (Source: Own research)

	Rank in the league	Rank in AGREPREF
Manchester City	1	1
Liverpool	2	2
Chelsea	3	5
Tottenham Hotspur	4	3
Arsenal	5	12
Manchester United	6	14–15
Wolverhampton Wanderers	7	4
Everton	8	7
Leicester City	9	8–11
West Ham United	10	8–11
Watford	11	6
Crystal Palace	12	8–11
Newcastle United	13	8–11
Bournemouth	14	16–17
Burnley	15	16–17
Southampton	16	12
Brighton and Hove Albion	17	14–15
Cardiff City	18	18
Fulham	19	19
Huddersfield Town	20	20

Also, according to AGREPREF, both the Wolverhampton Wanderers and Watford were ranked higher than in the league. But they were not ranked as high as according to ORESTE. According to AGREPREF, the best performances were shown by Manchester City and Liverpool, which corresponds with the league results.

Once again, the bottom of the table corresponds to league results. The clubs Manchester United and Arsenal were also ranked as worse performing clubs than the league overall, but not as the worst-performing clubs overall.

From the results, it seems that the AGREPREF method more closely follows the results from the league season than the ORESTE method. The comparison is shown in Table 6, where the rank differences between the rank in the league and the rank according to the method are also shown. Since both methods resulted in only a quasi-arrangement, the difference is calculated from the mean ranking. A positive value in the difference means that the club is ranked higher by the method than in the league, while a negative value means that the club was ranked lower by the method than in the league.

Table 9 Comparison Table (Source: Own research)

	Rank in the league	Rank in AGREPREF	Difference AGREPREF	Final rank ORESTE	Difference ORESTE
Manchester City	1	1	0	4	−3
Liverpool	2	2	0	7–9	−6
Chelsea	3	5	−2	7–9	−5
Tottenham Hotspur	4	3	1	3	1
Arsenal	5	12	−7	19	−14
Manchester United	6	14–15	−8.5	20	−14
Wolverhampton Wanderers	7	4	3	1	6
Everton	8	7	1	10–12	−3
Leicester City	9	8–11	−0.5	10–12	−2
West Ham United	10	8–11	0.5	16	−6
Watford	11	6	5	2	9
Crystal Palace	12	8–11	2.5	7–9	4
Newcastle United	13	8–11	3.5	5	8
Bournemouth	14	16–17	−2.5	17–18	−3.5
Burnley	15	16–17	−1.5	6	9
Southampton	16	12	4	13	3
Brighton and Hove Albion	17	14–15	2.5	17–18	−0.5
Cardiff City	18	18	0	10–12	7
Fulham	19	19	0	15	4
Huddersfield Town	20	20	0	14	6
Standard deviation			3.248		6.755

When we examine the standard deviation of the differences between the two methods, the AGREPREF method appears to more closely follow the final league standings of the clubs. This is because the sum of the weights for the criteria "total points" and "total revenue" is almost 0.5. This makes sense, as clubs with a strong sporting record usually generate higher revenues. As a result, clubs with a better sporting performance tend to be ranked higher more often in the pairwise comparisons.

However, it is not possible to claim that the AGREPREF method is more efficient just because it is more consistent with the league results. Similarly, it is also not possible to claim that the ORESTE method is preferable for this reason. The choice of the final method would deserve a more thorough analysis and, above all, the inclusion of the results of other methods. Clubs can be compared using these methods, and while they do not always produce a complete ranking, this is not necessarily a drawback. In some cases, an incomplete ranking is actually preferable, as clubs may achieve identical performance in the evaluated criteria, and this should be properly reflected.

DISCUSSION AND CONCLUSION

As mentioned above, using multiple methods for comparison would be essential to determine which method is more appropriate. While the choice of criteria itself is also highly debatable. Although the criteria are chosen to encompass all three objectives of a football club, this does not mean that they are the most appropriate criteria. As evidenced by the fact that researchers disagree on the choice of these criteria. One question to consider is whether to choose total profit/loss instead of revenue and wage costs. Additionally, the sporting results do not include performances in European leagues, which is also a very important factor.

Furthermore, there is the question of whether to include the number of employees at all, as this figure is partly reflected in the total wage bill. On the other hand, it may indicate a level of efficiency in staff utilization. Similarly, one could debate whether it is more appropriate to consider the number of fans on social media or the number of fans in the stadium. The preference for social media metrics stems from the global reach of the English Premier League, which the number of stadium attendees cannot fully represent.

Additionally, the weights and order of the criteria are open to discussion. A different prioritization or weighting could significantly alter the final ranking of the clubs. For this reason, a broader academic discussion on the selection and appropriateness of possible criteria would be highly beneficial.

The very fact that Premier League clubs are examined in this article influences the choice of criteria. Each league is different, so it is not possible to compare, for example, the Czech, Scottish, and English leagues. If a different league is chosen, it would be appropriate or even necessary to choose different criteria. For example, in the Czech league, including wages in the analysis would be problematic because players and many employees in club management are self-employed. As a result, these costs are presented together with other services in the financial statements. In smaller leagues, the revenue structure of clubs is different. While English clubs generate most of their income from sponsorships and broadcasting rights-making it meaningful to include fans from around the world in the analysis-clubs in smaller leagues primarily rely on UEFA rewards from European cups or ticket sales. Therefore, depending on the league, it would be appropriate to include stadium attendance or sporting performance in European cups as criteria.

If we want to evaluate clubs in a comprehensive way it would be beneficial to compare their performance across several consecutive seasons. A single poor season does not necessarily indicate mismanagement. However, the aim of this article was not to provide a comprehensive evaluation of football clubs but rather to contribute to the ongoing discussion about the most suitable evaluation methodologies.

Future research should explore additional methods and compare their results with those presented here. It would be valuable to apply methods such as UTA (UTility Additive), WSA (Weighted Sum Approach) and ELECTRE. Both UTA and WSA could give a full ranking of the clubs, while some of the ELECTRE methods can divide clubs into efficient and inefficient ones.

In conclusion, both methods can be utilized to evaluate football clubs; however, they typically provide only a quasi-arrangement. As such, other multi-criteria deci-

sion-making methods may prove more suitable. Further research is necessary to determine the optimal set of criteria for such evaluations.

Based on the results of the observed season, the Wolverhampton Wanderers and Watford demonstrated strong performances, while Manchester City and Tottenham Hotspur also performed well. Conversely, Manchester United, Arsenal, and the relegated clubs exhibited the poorest overall performances during the season.

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Address correspondence to the Faculty of Physical Education and Sports,
Charles University, José Martího 31, 162 52 Prague 6 – Veleslavín, Czech Republic
e-mail: auc-k@ftvs.cuni.cz

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