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The role of futsal in football talent development: A qualitative analysis of expert coach perceptions

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ABSTRACT

Futsal has become a prominent research focus, both as an individual sport and due to its unique potential for coaches enhancing football Talent Development (TD). This paper explores connections between game formats and the potential benefits of futsal to football through semi-structured interviews with ten elite coaches qualified in both formats. Inductive thematic analysis supported futsal as a potential tool to develop skills with results indicating that futsal could successfully and positively transfer to football with findings developing several explanatory mechanisms. Specific constraints of futsal, such as the ball, surface, court size and boundaries, were perceived to dictate player behaviours, and the skills they develop, many of which could be beneficial to football if delivered appropriately. Results indicate that futsal is characterised by high game speed, most notably during transitions (possession exchanged between teams) plus nuanced receiving and scanning behaviours. Findings suggest these elements are regarded by many as important skills in football TD. Against the positive perceptions on futsal's value, findings identify potential barriers and provide views of how futsal should be governed and successfully delivered. This study could help coaches, coach educators and stakeholders to facilitate the growth of futsal as both an individual sport and as a positive tool for TD in football.

Introduction

The process of Talent Development (TD) in football is a key area of interest for coaches and academics [1]. Within this context, futsal has recently become a prominent research topic, as coaches, clubs and NGBs seek to explore the potential benefits it may have for football TD [2,3]. Originally created as an alternative modality to football [4]. this indoor small-sided game (SSG) has grown exponentially, with huge participation numbers (60million as of 2007) and official governance from 'FIFA' [5]. Anecdotal support for futsal's benefits to TD is widespread from players and coaches [6,7]. Research has also begun to explore the skills developed through futsal participation [8–11] and investigate its potential to enhance football TD [12–14].

Comparisons between formats lead to pertinent discussions about the possibility for skills learnt in futsal to transfer successfully to football [2]. Similarities between sports are deemed an obligatory requirement for optimising transfer [15–18], with some research seeking to assess skills transfer from futsal [12,19]. When considering similarities, however, examining futsal characteristics is integral, with decision-making research such as ecological dynamics offering a theoretical explanation for player behaviours. The ecological dynamics perspective suggests that behaviours are shaped through interactions between players and their perceived environment, in which perception and action are coupled directly, with constraints changing the information available [20,21]. Coaches can manipulate specific task constraints which dictate player learning and behaviours, such as the laws inherent to authentic futsal. Ecological dynamics is applicable to utilise as a theoretical framework through which to consider futsal constraints, characteristics, and subsequent player behaviours. As such, language utilised in this paper does relate to ecological dynamics notably with objectives one and two. Ecological dynamics has not restricted our research question which includes broader considerations around delivery, governance,

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and applied challenges with objective three.

Futsal constraints certainly impact the physical demands of this high-intensity intermittent sport. Players cover an average distance of 4000 m during 40-minute games, interspersed with relatively high frequencies of accelerations and decelerations [11,22,23]. Differences between football and futsal behaviours may be further explained by constraints of the court/pitch dimensions and surface [14,24]. Research during elite match-play shows high mean heart rate values (HR_{mean}) of ~88% and maximum heart rates (HR_{max}) of ~98% when on court, with unlimited substitutions promoting high 'work-rates' when on court [25]. The importance of the physical demands of futsal to football TD are part of the overall objective to explore skills transfer in this study.

Futsal constraints also dictate technical skills. Longitudinal research has examined scanning behaviours in futsal [10], with higher frequencies associated with more successful passing and hence, deemed a desirable skill [26–30]. Furthermore, futsal players receive ~75% passes using the sole [14], with ball characteristics a possible causal factor [31]. Match-analysis of passing in international futsal reveals high pass completion rates ~87% compared to football ~76%, perhaps due to longer passing distances in football [14] or potential differences in scanning ability. Overall, these factors stimulate discussion in coaching communities on the potential for futsal to develop skills which successfully transfer to football and positively enhance performance. Globally, large discrepancies can be seen in the way futsal is resourced, how it is perceived at a governance level, and the subsequent connectivity with football, which combined influences both participation and performance. In part this may be due to a lack of research, thus developing theoretical understanding and applied guidance, is an objective of this study.

Whilst there is a drive to quantify futsal game characteristics such as those discussed, generating empirical evidence can produce limitations, notably in the 'representative design' of test conditions [32–34]. Therefore, researchers are challenged to utilise alternative epistemological approaches to complement and enrich existing research influencing methodological choices in this study [35]. Examining the perceptions of expert coaches in both formats is a novel approach to address this methodological gap and would add a qualitative voice to existing positivist research, enlightening perceptions of both communities that are not always optimally collaborative [36]. Specifically, the experiences of an elite sample of coaches working at an applied level could highlight challenges, barriers, and complex human connections that quantitative methods would find difficult to assess.

To that end, examining a unique population who have experience of coaching both football and futsal enable theoretical views on skills transfer to be examined with potential causal factors identified. Exploring the potential complementarity of both formats could support coaches seeking to integrate futsal into football TD and deliver it harmoniously. Analysing perceptions of elite coaches in both sports may also provide useful practitioner knowledge, to benefit TD, coach education and governance [37].

Therefore, the objectives of this study were to:

1. explore the potential for skills developed through futsal participation to transfer to football;
2. identify the characteristics of futsal which could be a mechanism for coaches to use in football TD, and;
3. establish ways in which the delivery of futsal can be optimised for coaches and stakeholders.

Methodology

Research strategy and philosophy

A pragmatic research philosophy was used to ensure that the study would make a positive impact for coaches in football TD and coach education [38]. In pragmatism, individual and contextualised experiences are perceived based on an interaction with the environment, which is interpreted with the objective of synthesising applicable and impactful outcomes [39]. Pragmatism seeks to emphasise action and change based upon the relationship between knowledge and practice, with analysis discovering plausible explanations, with valuable real-world usefulness [40]. We aimed to achieve this real-world impact by providing actionable knowledge for coaches and stakeholders related to the possible use of futsal in football TD. Reflecting the nature of the research inquiry, a qualitative methodology was applied acknowledging the individual perceptions and experiences of the participants in this study. Semi-structured interviews were utilised, primarily to allow interviewees to elaborate without the rigidity of structured interviews. This approach enabled the discursive analysis of rich data, that are often challenging to 'measure'. This strategy is relevant to the context, creating a pragmatic-orientated research process, generating practical level 'truths' and developing applied impact.

Participants

A purposive sampling recruitment strategy was adopted to intentionally obtain an elite sample with extensive experience, and qualifications in both football and futsal in accordance with the stated objectives of this paper [41]. Twenty participants were initially contacted through the lead author's industry connections. Social media posts were also created to invite eligible individuals seeking to enhance the sample size and diversity. Snowball sampling was also encouraged attempting to reduce the risk of relational proximity, homogeneity in the data and reduce social desirability bias, adding richness to the data.

All coaches were required to possess UEFA 'A'/Pro licenses in football, amongst other coaching ('Advanced Youth Award' and goalkeeper specific) and academic qualifications. Additionally, participants were required to possess a UEFA 'B' futsal coaching qualification which at the time of writing was the highest available. These high-level qualifications reflect the coaching experiences of participants to distinctively judge the potential of futsal to football TD. Substantial professional coaching experience $>$ 10 years was also a criterion. These inclusion criteria were deliberately selected to ensure a sample that has coaching experience and qualifications in both formats, reflecting the elite level of the sample and consequently, its small size which should be considered proportionate to the number of eligible individuals. All participants were given an information sheet and invited to ask any questions. Participant confidentiality was ensured, and participation in the study was entirely voluntary with withdrawal permissible without consequence. Following this informed consent was obtained.

Ten male participants (M_{age}=49.5 years±12.8) were selected with a mean average of 22.80 years±7.98 of coaching experience. Five participants had been Head Coaches of international male futsal teams; one having managed multiple international level teams across two continents including one women's team. Two had been international level Assistant Coaches with an international level goalkeeper specialist included adding richness to the data. Three additional coaches were recruited having occupied various roles in professional football with one having a NGB role as a coach developer adding broader perspectives to the data. The diversity of job roles occupied by this sample is considered to add richness, through variety in perceptions due to exposure to different working environments longitudinally across several countries.

Although research acknowledges the complexity of defining expert coaching, justifications for labelling our sample as elite/expert were framed against a model for expertise in coaching [42]. Specifically, this work acknowledges the importance of knowledge (and other potential criterion) evidenced (in part) through 'in-role examinations' (such as coaching qualifications), alongside a 'track record of producing athletes' (evidenced through job role), which we feel is reflected in our inclusion/exclusion criteria [42]. Given that seven of the sample worked with international level players (identified as elite using a framework for athletes [43]), the whole sample possessed high-level qualifications in

both formats, and displayed experience > 10 years, referring to the sample as elite/expert was deemed appropriate when considering the overall inclusion criteria. Moreover, we seek to ensure transparency in the way the sample has been described whilst acknowledging the problematic and contextualised nature of defining expertise. Institutional ethical approval was granted prior to commencing data collection (Reference number: BAHSS 372).

Procedure

Authors collectively agreed the interview schedule which was piloted to assess effectiveness of questioning and content discussed. To ensure the pilot procedure was representative of the sample, two coaches were selected (M_{age}=34.50 ± 1.77), qualified with UEFA A licenses in football and a Level 1 futsal qualification (with various other academic qualifications). Both had > 10 years coaching experience (including both formats) working in professional football club youth academies. The interviewee feedback was discussed by all authors to ensure a complete process. The interview schedule was subsequently adjusted with an additional question added to collect demographic information to quantify coaching experience, and language simplified to improve clarity. All pilot test results were omitted from analysis. Topics covered in the final interview schedule were: 1) potential skills transfer between futsal and football, 2) the impact of futsal constraints and, 3) requirements for TD stakeholders using futsal. Questions were open-ended in structure with probes utilised flexibly to promote reflection and richer descriptions of their contextualised experiences whilst answering the study aims and objectives. To ensure reliability, the same interviewer conducted each interview, with locations arranged at participants' training facilities to ensure familiarity, or using Microsoft Teams as required. Six face-to-face and four online interviews were recorded and transcribed. Mean interview duration was 52.02 mins, SD ±10.65.

Data-analysis

Inductive thematic analysis (TA) was utilised to identify patterns that provided data-driven perspectives on futsal's role in football TD [44]. The six-phases of TA were used to guide procedures [45]. Initially, the primary researcher read transcribed texts, familiarising and immersing in the data (stage 1). Patterns were identified through a rigorous sequential process of data familiarisation and coding (stage 2) during which a reflexive journal was kept as a tool to critically engage with interpretations of the data, whilst acknowledging any preconceptions [46]. The codes were then developed into preliminary themes (stage 3) by the first author which were then discussed during meetings with all authors to challenge data interpretation seeking to operationalise a collaborative and reflexive approach (stage 4) [44]. These stages were recursive and flexible revisiting transcriptions and the reflexive journal enhancing transparency, reflection and rigour. Themes were clustered for commonalities (stage 5), by the primary researcher, before the additional authors reviewed this process seeking to enhance reflexivity and interpretative depth [44,47]. As an example of this analytical progression, the importance of constraints was developed into individual codes and a subsequent draft theme. Alternative SSG formats were also comparatively discussed related to constraints. Through the collaborative review process, it was decided to separate SSG comparisons into a separate preliminary theme, which was later enveloped into a larger governance theme in the final iteration. This is an example of the reflexive process aimed to ensure themes accurately portray the data sincerely and develop a coherent, meaningful story to answer the aims and objectives in the final presentation of findings (stage 6).

Quality of the study

Criteria proposed by [48] have been used to enhance the quality of the study. Following ethical approval, the rigorous systematic approach to recruitment allowed for the selection of elite, highly experienced and qualified participants generating rich information through a qualitative enquiry [49]. The personal experiences of the lead author are positive in many ways (knowledge, rapport, access) which was further enhanced by the varied but relevant expertise of the authors. Mindful of subjective opinions, an interview schedule was agreed by all researchers, with a pilot study completed to ensure rigour. To support reflexivity, regular meetings were scheduled during data-collection/analysis to check and challenge all elements adding interpretative depth, with direct quotes presented to ensure sincerity. To ensure confidentiality, data was anonymised, with participants referred to as A, B, C etc., with identifiable data removed.

Results

During-analysis, four overarching themes were developed. These were 1) The benefits of futsal to football TD; 2) Futsal constraints; 3) Futsal characteristics; 4) Governance, structure, and futsal delivery. These are presented visually in Fig. 1 and supported by direct quotes:

1. The Benefits of Futsal to Football TD

The first theme presents the extent to which futsal could contribute to football TD and, crucially, whether skills could transfer. Data showed a broad perception that futsal could positively develop football TD, with probable transfer exemplified by Participant A: *'I think it hugely compliments football development, but it has to be woven in quite cleverly'*. Additionally, data suggested that transferable skills are holistic in nature as discussed by Participant B:

> I think everyone should be exposed to it because the game offers so many positives…futsal can only help develop a player intellectually, physically… and that can only be a good thing for football because if you have got a very astute intelligent player that is thinking quickly, think on an 11-a-side pitch how much time that person has, the skills that they have developed, the perception that they have acquired from futsal and they can then use that in 11-a-side.

Furthermore, clarity of specific futsal constraints was emphasised, implying that a deeper examination is vital to understand player learning. In short, some futsal constraints may be more beneficial to football than others. Hence, the second overarching theme, identifying specific skills developed through futsal game constraints.

2. Futsal Constraints

Futsal constraints and their specific impacts on player learning were explored in detail with authenticity deemed crucial. Participant F: *'I think we have to be really adamant about the identity of the constraints. And we need to be quite influential over the coaching'*.

Three sub-themes were developed regarding the impact that specific constraints may have on player development, which are presented next.

The futsal ball and its interaction with the court

Futsal is characterised by the ball, which differs to a football ball in size, coefficient of restitution (bounce) and deformation/reformation characteristics. The differences between football and futsal balls have been quantified in recent research and represent distinct task constraints [31]. The combination of the futsal ball and the hard surface were perceived as vital for player learning. Participant D suggested that the ball and surface are constraints which can facilitate specific objectives through strategic futsal participation:

> For very young players we can't go from back to front because the heavier ball it is a little bit more difficult to do that, so what you do

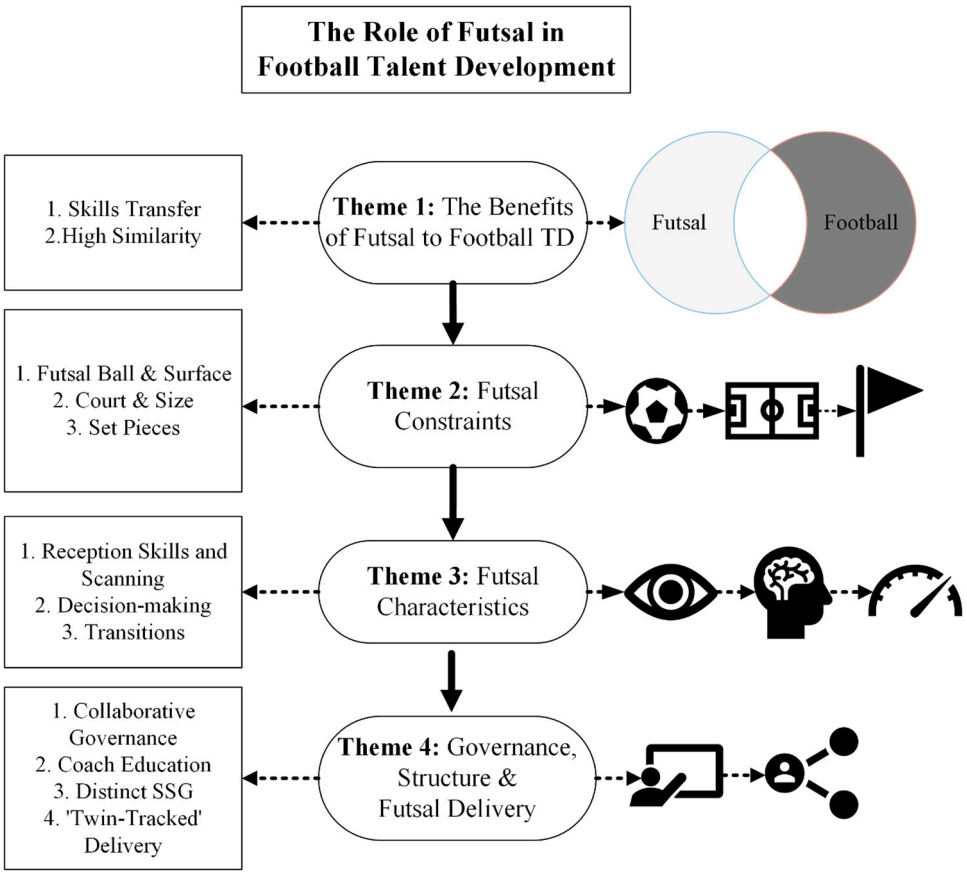

Fig. 1. Thematic Flow Chart.

> get is lots of little lifts and you know lots of more disguise and fakes with the ball because you're having to problem solve as well how can I get out of this situation? Not being able to boot the ball from one end to the other, so I think it helps individuals, but it also helps promote that idea of combining creatively.

The combination of ball and surface leads to a higher speed at which the ball travels whilst simultaneously increasing control possibilities. Participant A: *'It moves quicker to start off with but then it's easier to control, so actually if you think about again going back down to the passing and receiving elements of the game, it actually lends itself to development more'*.

Court size and boundaries

A typical adult futsal court measures 20x40 m, identified as another important constraint, with relative playing area (RPA) between formats discussed. Participant F identified information released by UEFA:

> You may well have seen the graphic, the 37v37 graphic so the relationship of seven and a half futsal pitches to a football pitch, means that we automatically educate players through the game in how to deal with the ball in tight spaces.

Participant A linked the amount of space to players learning how to manage the pressure of defenders being closer, and developing confidence: *"We can give players that kind of confidence on the ball whether they are in lots of space or whether they are under really, you know, tight pressure and I think that is one of the unique selling points"*.

Meanwhile, smaller courts demand fast and accurate passing due to interpersonal distances [9,23]. Participant C suggested that faster passes can be made, requiring accuracy and 'detail':

> The space is so tight then players when they are used to it can really… and they know it is going to get controlled can really punch the ball in, and that is going to give players a fraction of a second more to be able to receive the ball, so that is on the passing, by the way the detail on the passing, if they are really going to punch in the detail has got to be right, so by the detail I mean you know what foot are they playing in to, you know does that depend on where the defender is marking them so they have got to get that detail absolutely spot on.

Set-pieces

The third sub-theme considered set-piece frequency because of court boundaries. Participant C suggested that set-pieces are vital in futsal and identified similarities that promote skills transfer supporting football player development:

> I think around 30% of goals from set-pieces, corners, high kick-ins, erm so yes massive part of the game. I think there is lots of transfer in terms of the quality of movement to generate small pockets of space, that is critical, I think erm blocking you see blocking sometimes in football, Real Madrid tend to do it really quite well at corners, generally they will be working off a set move with probably three variations.

Participant D supported the importance of developing skills from restarts, and compared the attention to detail in this regard to football:

> I think futsal gives you a lot more variety and forces you to think more about how can we use this situation where we can actually get organised and put players in certain positions and we have practiced it week after week after week so it becomes more of an opportunity to

score a goal. I think futsal, the way that the defences organise themselves, it actually is quite difficult so you have got to be highly skilled if you score from the restart, but I think the application of that erm concept in to football I think would give us a lot more variety around you know corners and free-kicks, particularly around the box.

3. Futsal Characteristics

Due to the combination of futsal constraints, characteristic behaviours were developed as an overarching theme. Identifying specific futsal characteristics is vital in establishing connections to football, especially from a coach's perspective, whilst also guiding future academic research seeking to measure transfer. Three sub-themes were developed:

Receiving skills and scanning behaviours

Participants indicated that in futsal, ball reception is distinct, characterised by greater use of the sole, whilst generally encouraging ball manipulation, as players seek to exploit interpersonal distances. Additionally, players typically scan as the ball travels due to reliable ball movement. Participant E emphasised the importance of body orientation and foot reception, optimising ball retention whilst facilitating the next moment. This may contrast football due to the surface.

As a player you need to think receiving safe side sometimes as opposed to receiving on the back foot erm and then what it does allow you to do is lift your head quite a lot more, so if you know that the ball is securely going to come to you because there is no bobbles on the sports hall floor.

Additionally, participants suggested that reception skills are especially important when receiving from a goalkeeper, with laws limiting pass-backs. This contrasts football where pass-backs are permissible. Participant C:

Be able to play forwards, because if you don't then you are probably going to invite pressure and you're going to land yourself in trouble erm I think the other technical impact really is that players need some support behind a ball erm which would be valued in football as well, so I think there is a real place for it, erm I think it really does focus the players on their receiving skills erm I think it makes them think about the body shape to receive… earning space to receive, I think it makes them think about how they are going to land on a ball and look to play forward.

An element of reception skills discussed by participants related to defensive 'pressure'. This pressure requires participants to perform actions quickly, which introduces the next sub-theme discussing game speed.

High game speed

This sub-theme discusses the ability of futsal players to make effective decisions quickly because of a high game speed. Participant A stated that decision-making is vital and must be done quickly due to game characteristics:

Fast decision-making, fast quality decision-making is one thing it develops and also passing, I think. It's so good to create better passers and better passers in tight areas, better passers in you know breaking blocks, forward passers so I think those two things would be for me the real sort of … and then it adds to the combinations because if you're a better decision maker, a better passer, that then develops 2v2 combination.

Related to decision-making speed, the positional differences between formats for goalkeepers were also discussed. Key differences relate to the number of outfield players, the smaller spaces, goalposts (2x3m) and futsal laws preventing pass-backs, whilst also placing time constraints on goalkeepers receiving passes. Participant B:

Futsal it is vastly, vastly quicker, erm the information that has to be processed, taken in, then processed and then provide solutions erm well just the sheer fact that it is a four second rule for the keeper that if you don't have a logical thinking process, a logical way of taking the information and getting the solutions out erm you are in trouble in futsal and you don't have those constraints or those pressures really in 11-a-side.

The potential impact a high game speed could have on TD is important. Exposing players to futsal, may facilitate the development of quicker cognitive, perceptual and motor skills, which if transferred to football, may enhance performance. Futsal participation may support the development of fast decision-making, which is important in football notably during moments such as transitions.

Transitions

Transitions occur when possession changes between teams, creating decision-making challenges for defences to reorganise, and for the attacking team to counter-attack [50]. Participant A compared player behaviours during transition:

One of the biggest things that footballers miss, I think, is the speed of transition in decision-making, so it's not just on the ball decision-making in terms of passing, it's the game decision-making, so if you lose a ball what do you do, if you win the ball how quick can you go.

Participants D supported this for younger players:

I think there is a huge connection between the amount of transitions you get in futsal and how that can be applied in 11-a-side football but for me in the foundation phase I see transitions as opportunities for players to travel really quickly with the ball so they get lots of practice at that.

4. Governance, Structure, and Futsal Delivery

The fourth overarching theme developed included participants' perceptions on the successful delivery of futsal. Data suggest that futsal could be useful in football TD, thus, ensuring the successful delivery of authentic futsal was perceived as crucial. Futsal has distinct requirements in facilities, equipment, and laws, governed by FIFA which should be adhered to as much as possible ensuring holistic benefits. Whilst acknowledging its individuality, futsal was deemed to be connected to football, with successful governance requiring education, knowledge, and financial support to exploit complementarity. Participant I epitomised the philosophy that futsal can be both an individual sport and simultaneously a positive developmental tool:

I think there's an opportunity for it to be used as a development tool. I think there's an opportunity for it to be used as people that want to find their career in the sport, and I think that's how it should be badged up. It should be for what the user requires it to be not for, not for one reason or the other

Three sub-themes were developed regarding coach education and the delivery of futsal.

Coach education and knowledge

Participants were cognisant that understanding futsal constraints requires coach education. Results suggest that enhanced coach

knowledge could promote faithful and skilful delivery, encompassing all or most of the task constraints which create the identity of futsal and an awareness of the nuanced changes to player learning when adapting constraints. Participant C illustrated this:

> I think it is understanding that whatever we change, the ball, whether we change the goals, whether we change the surface erm you know to lines of the rules, … do coaches really understand what they are getting erm and then what a trade-off is … I am not convinced yet that coaches generally really, really get that.

A need for open-mindedness from coaches was also judged important reflecting large cultural/social variances in different countries/regions. Despite any possible cynicism towards futsal, the perceptions were positive with a need to integrate futsal within coaching education structures, supporting workforce development. Participant D discussed this:

> I think some people's reluctance not to engage with it comes from a lack of understanding of what the game is like or what it can offer to player development but, more importantly, to coach development…I think the coach development aspects are huge.

Despite possible barriers to the inclusion of futsal in coach education, perceptions were positive in developing acceptance and understanding. Specifically, coach knowledge will help differentiate futsal from other SSG formats which may detract from the beneficial constraints identified previously.

Small-sided games comparison

Related to coach education, the next sub-theme covered the necessity to clarify the differences between futsal and other SSG versions and the impact of distinct futsal task constraints. Participant F explained false perceptions that some coaches may have because of a lack of education and misinterpreting futsal laws and characteristics:

> We think we are playing futsal, what we're actually doing is playing five a-side on a futsal pitch, we might have the goals, we might have the footwear, we might have the ball, or a couple of those elements but not all of them and we call it futsal because that is what we believe it is, but in reality it is still five a-side football. How do we change that? We change that through coaching, we change it through knowledge and education.

Participant D managed futsal at international level and compared different countries, suggesting authenticity is sometimes lacking, creating a disparity between alternative SSG's limiting player learning: *"there are so many areas where the game is a greater contributor than what we domestically see with a big fluffy tennis ball being kicked against walls"*. Given this, research is needed to support coach education ensuring any integration of futsal into TD curricula is done so knowledgably.

TD models and futsal

Given the positive perceptions already presented, this sub-theme identifies the ways participants propose futsal should be delivered, structured and governed. Overall, the sample felt that greater respect from football NGB's could lead to greater connectivity and support alongside the sharing of resources. The enhancement of resources would become mutually beneficial for both formats in many ways. Participant J has occupied the role of Head Coach for multiple international level teams, including men's and women's futsal. This work has required travel across the globe developing perceptions on futsal's governance: "*Futsal is not accepted in many, many countries that is one. There's no connection between football and futsal at the moment*". This causes a lack of resources and in some cases futsal clubs/teams/nations must independently seek capital as football NGB's don't always share funding: "*Sponsors pay everything for futsal and the money stay in [a NGB]. That happens in many, many countries and that's a shame"*.

Despite these challenges participants expressed a desire to draw both formats together harmoniously to support TD. Participant D provided detail about how futsal could be successfully structured, suggesting both football and futsal should be delivered parallel in a 'twin-tracked' approach:

> I think futsal is a great way of meeting some of the individual needs that players have in order for them to be effective footballers, so I think it needs to be used as a development tool… I would like a twin-track programme up to the age of 14 if possible erm but that would have to be included not just training futsal it would also be competitive games in futsal for what the competition gives you as well.

Participant H worked in multiple countries/continents developing broader views on youth TD programs, whilst observing differences in playing styles and skills. Those observations encouraged comparisons to players exposed to futsal in a 'twin-tracked' approach and those who had not: "*The South American kids that play futsal are technically better in terms of that kind of 1v1 beating a player, even their defensive attributes*".

Results also identified frustrations that futsal is perceived only for younger players stunting the potential learning for older players. Participant G: "*I think it's still perceived as a foundation phase activity or additional part of the games programme tends to kind of stop at twelves"*. Participant E discussed the need for futsal to be integrated for older ages beyond Under 12 SSG's due to its potential for TD:

> For me the biggest frustration within erm within erm academies at the minute and in what we're doing in the country with futsal is we get to the age of 12 and then they don't play it so erm for me it needs looking at and really asking the question of OK if we think futsal is valuable for developing you know youth development football players, is why do we stop at the age of 12.

Discussion

To our knowledge, this paper is the first that has explored the potential benefits of futsal to football TD using semi-structured interviews with elite coaches, with previous literature utilising alternative methodological approaches. Results suggest that futsal practice may positively influence football performance and proposes potential underlying explanatory mechanisms. Results identify the impact of futsal task constraints and the related skills which characterise futsal performance [14,21]. Our findings may facilitate coach education, providing substance to clubs/NGBs considering including futsal in TD programs.

The benefits of futsal to football TD

Transfer between sports or from training to match-play is a focus for coaches, who seek to promote transfer by designing sessions with realism aligned to match-play under relevant informational constraints [15,16,34]. The complexities of designing representative tasks during practice remains an area of scrutiny [17]. Our results present perceptions that futsal can be beneficial to football TD, with skills transfer perceived as likely owing to high similarity. The mechanisms behind this perceived transfer are discussed, with specific similarities identified which may aid coaches at an applied level. Our findings resemble those of research using surveys to examine high-level coaches' perceptions on the potential benefits of futsal, with 89.6% indicating futsal's usefulness to football TD and 90.9% considering its use [13]. Our results may support the substantial anecdotal perceptions [6] and empirical studies that suggest skill transfer and complementarity between formats [12–14]. The findings of this paper are posited through coach perceptions which must be compared to empirical studies seeking to quantify and measure skills transfer between formats. Existing work measured

the transfer of passing skills, which was shown to successfully transfer to a football task, grounding our findings objectively [12,19,51]. In this research it was demonstrated that futsal practice promoted the development of 'higher passing and decision accuracy' which successfully transferred to a football-based task. Authors argue this is due to futsal task constraints encouraging attunement to key information that provides passing affordances. Understanding similarity more broadly, inclusive of a variety of skills and player behaviours by exploring futsal constraints provides essential knowledge to support coaches and stakeholders practically.

Futsal constraints

Participants identified that the ball and the surface influences ball receptions, manipulations and scanning behaviours. Futsal ball constraints dictate a reduced coefficient of restitution [31], with a smooth hard surface producing a more reliable role, a potential mechanism behind more frequent sole of the foot receptions [14]. Futsal constraints may provide affordances to perform these skills with consequential behavioural responses potentially supporting football TD. Laws limiting pass-backs also demand effective reception skills to retain possession and progress effectively. Reflecting similarity, these behaviours are important in football, with research using match-analysis outlining comparable technical characteristics [52,53].

This study suggests that futsal constraints may influence scanning behaviours adding coach perceptions to previous investigations [10]. Overall, higher scanning frequencies are associated with enhanced performance, notably in successful passing [27,28,30]. Recent research analysed English Premier League football, identifying that typically players engage in frequent visual scanning in the seconds prior to reception, although positional (midfielders and defenders scan most, forwards the least) and contextual (pressure/distance of defenders) differences are evident [27]. Additional research in elite youth football found that the average 'final' scan was 1.70 s before reception [30]. Differences in perceptual-cognitive behaviours are also observed between 'less-skilled' and 'skilled' participants, with the latter showing more accurate anticipation and decision-making skills, which was claimed to underpin task-specific scanning [29]. Specifically, 'less--skilled' players fixated more frequently, for longer durations and were 'guilt of ball-watching' during both 'near/far' football task constraints using a video stimuli task. In contrast 'skilled' players were able to scan more frequently displaying more accurate anticipation and decision-making. In this research ball proximity defined the two task conditions (near vs far), with the near task more like futsal due to a closer proximity to the ball because of court size. More specifically, research suggests that players scan for information including opponent pressure, team-mates, space and distances and is a crucial skill [26,27,30]. Other research suggests that football players with higher scanning frequencies can 'switch-play', make attacking passes and turn more often [27,28]. Futsal research suggests that scanning behaviours emerge through long-term practice, which, if successfully transferred to football, could influence TD positively [10,12]. Developing scanning abilities has been considered integral by coaches, yet the optimal way to nurture these skills is unclear [54]. This skill development should not happen in isolation but instead be nurtured during practice conditions of higher ecological validity with more representative task constraints [29]. The findings of this study provide practical considerations for coaches and may guide future researchers seeking to extend empirical research on this topic. Futsal participation may promote variety in scanning behaviours when compared to football, notably in scanning frequency. We speculate that applying this with players would require the skilful delivery from coaches to consider the finer and context specific information of scanning such as the timing of head movements, adjustments of body orientation reported in our results, along with an understanding what information players need to search for. In seeking to transfer those skills to football, scanning behaviours will need to adjust to larger pitches/distances with more players/complexity and spatial-temporal differences. Overall, our findings suggest futsal could represent a useful development tool for coaches seeking to provide variety in receptions, ball manipulations, and scanning behaviours, with skills transfer to football perceived as likely in this study. In addition, the higher level of passing accuracy may be transferred, with coach perceptions showing agreement with the findings of previous research [12,19].

Court size and boundaries are integral to futsal's identity differentiating it from other SSG's and football [9,23,24]. Our results identified the limited space on-court as a constraint providing affordances in many technical skills whilst challenging psychological skills such as confidence. For coaches seeking to use this study to develop applied practice, it is important to understand the constraints of futsal that differentiate it from other SSG in football beyond playing area dimensions and the number of players. The ball and the surface certainly differ and have several impacts on receptions including using the sole of the foot, orientated control and scanning behaviours. In addition, futsal specific laws related to the goalkeeper (pass-back/possession laws) impact strategies to play out from the back. Goalkeepers must make quick and effective decisions on when and how to do this, whilst the receiving player needs to problem solve on how best to retain possession (receptions, orientated control, scanning) and supporting players to make space (individually and collectively) and create passing lines. Concomitantly the defending team is then challenged on whether to press, scanning for triggers (poor passes/reception/orientation/support), whilst being mindful that the opposition cannot pass-back.

Furthermore, court boundaries facilitate effective set-piece skills, an integral part of futsal [14,50]. Our findings suggest that long-term futsal practice provides affordances to develop set-piece skills useful in both formats. This study identifies set-piece frequency in futsal as an important function in developing skills at kick-ins, corners, free-kicks and goalkeeper restarts. For coaches a key focus relates to the speed at which this can happen due to futsal laws, challenging both offensive and defensive teams to organise with rehearsed patterns that are effectively communicated. Specific detail related to the creation of space (individually or for team-mates) through deception or by blocking defenders along with variety of finishing techniques are all important parts of set-pieces in futsal. Although contrasting spatial-temporal differences must be acknowledged, these principles this study identifies are potentially transferable to football. This should be considered by coaches, and coach educators when comparing other SSG formats that do not have boundaries.

Futsal characteristics

Alongside specific constraints which elicit distinct behavioural responses, when considered together collectively futsal's unique characteristics emerge. This paper presents game speed as a characteristic which emerges due to constraints which is important in decision-making and skill execution [20]. Coaches identified that limited court size reduces interpersonal distances, demanding that players perform quickly offensively/defensively. On larger football pitches, the game speed demands may be lower, with futsal players potentially transferring skills and excelling under less 'pressure'. These behaviours manifest due to the task constraints discussed above and the consequential affordances [21]. Previous work has suggested that in international football, 'ball speed' increased by 15% between 1966 and 2010 and passing by ~35% [55], inferring that teams are making more passes and at quicker speeds. Therefore, the speed of futsal performance may become increasingly important to skills transfer. Previous research has also suggested that performers explore spatial-temporal relations continuously to select appropriate actions [56], concluding that skills such as passing should be practiced under task constraints representative of the sport. Combined, this research indicates that football characteristics are evolving, in both game speed and passing frequency, aligning more closely to

futsal. As similarity and transferability are associated, futsal could provide an environment for players to practice skills under high pressure supporting the evolutionary characteristics of modern football.

Results suggest that, in futsal, transitions epitomise this high game speed. Previous research showed that 87.0% of high-level coaches believe counter-attacking is an important facet of futsal with nearly 80.0% suggesting that it could be useful to football [13]. It has been suggested that, as football continually evolves, players are likely to be required to make decisions faster [55]. The current study supports these perceptions with participants suggesting transitions are frequent in futsal which could be useful in football where these skills are essential [57].

Governance, structure and futsal delivery

This paper has identified a perception of probable skills transfer between sports and has explained the potential mechanisms for this through futsal task constraints. Future research should seek to extend our findings and those of existing research [12] to empirically and objectively examine the full range of skills that this paper identifies as potentially important for skills transfer. This paper also identifies governance challenges, thus establishing the optimal ways to deliver futsal is vital. Despite the complexity of TD, governing bodies/clubs are challenged to intricately consider the inclusion of various elements which contribute to developing high-performance [58–60], with futsal representing a potentially novel addition to many football programs. A study comparing practice histories in youth football players globally revealed differences between countries, with most of the participating Brazilian players engaging in regular futsal 'play activity' [61]. This study identifies perceived skills that can potentially be developed through futsal which should not only be considered for the youngest players. Results also indicated that coach education is essential to ensure a positive TD impact. Coach knowledge and understanding are critical for faithful futsal delivery, promoting transferrable skills that we identify. Coaches should be educated on the distinct differences between alternative SSG formats that do not include futsal constraints because this could change the skills they develop. Thus, coach education is essential in creating expert practitioners able to utilise futsal appropriately during the coaching process [42,62]. Additionally, stakeholders involved in curriculum design should reflect on the present findings, with opportunities to build novel TD systems including futsal. Consequently, reviewing the resources made available for futsal is important in ensuring it can be delivered and the potential benefits for both formats can be exploited.

Limitations

It is important to acknowledge the characteristic limitations of qualitative research, such as a small sample size (common to elite sport contexts) and limited generalisability. The relatively small sample of ten elite futsal coaches is a likely consequence of the high-profile nature of the participants. Thus, a recommendation for future research is to recruit a larger sample size, from various countries globally, extending the generalisability of the findings. The sampling strategy should seek to vary the recruitment methods, widen the sample and seek to reduce homogeneity of the data. In addition, future research should utilise alternative sampling methods from sources other than author networks, to recruit a sample that reduces relational proximity. Recruiting a larger sample, from wider geographical regions is of particular importance based on the unique and elite sporting context of this paper. In addition, we acknowledge the potential social desirability bias of recruiting a sample with a vested interest in both futsal and football. To add credibility and to extend our findings, future research should seek to consider the views of individuals (if available) who understand what authentic futsal is but still do not perceive futsal to be of benefit to football. To triangulate our findings which depict coach perceptions, future studies should seek to empirically test these subjective opinions such as considering player performance data. Match-analysis of training or game-play in both adult and youth players will allow future researchers to quantify player behaviours and potential indicators of transfer. We acknowledge regional differences in the way governing bodies educate coaches as part of the coaching qualifications which this paper uses in inclusion/exclusion criteria. Future research could consider further examination of this or purposively recruit coaches with qualifications from different governing bodies globally.

Conclusion

Results of this study suggested that elite coaches regarded futsal practice as a beneficial tool for football TD which could successfully transfer. More specifically, constraints of futsal such as the ball, surface, court, and the use of boundaries were perceived to dictate player behaviours, thus the skills they develop. Additionally, futsal is characterised by its speed of play, most notably during transitions, with nuanced receiving and scanning behaviours which were regarded as vital skills in supporting football TD. The knowledge derived from this study could help coaches, coach educators and stakeholders considering the integration of futsal into football TD curricula. The perceptions presented in this paper could help to facilitate the growth of futsal as a respected individual sport and simultaneously for its potential as a tool for football TD.

CRediT authorship contribution statement

Christopher Carling: Writing – review & editing, Writing – original draft, Formal analysis. **Dave Collins:** Writing – review & editing. **Tynke Toering:** Writing – review & editing. **Christopher Yiannaki:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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