INTERNATIONAL DOCTORAL THESIS

YOUTH SOCCER COACHES' VERBAL COMMUNICATION SKILLS: PROMOTING KNOWLEDGE AND CHANGING BEHAVIOUR

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University of Granada

2023

UNIVERSIDAD DE GRANADA

UNIVERSIDAD DE GRANADA

FACULTAD DE CIENCIAS DEL DEPORTE
Universidad de Granada

YOUTH SOCCER COACHES' VERBAL COMMUNICATION SKILLS: FACILITATING KNOWLEDGE DEVELOPMENT AND CHANGING BEHAVIOUR

LAS HABILIDADES DE COMUNICACIÓN VERBAL DE ENTRENADORES DE FÚTBOL BASE: PROMOCIÓN DE CONOCIMIENTOS Y CAMBIOS DE CONDUCTA

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International Doctoral Thesis / Tesis Doctoral Internacional

Departamento de Educación Física y Deportiva
Facultad de Ciencias del Deporte
Universidad de granada

Programa de Doctorado en Ciencias de la Educación

2023

Editor: Universidad de Granada. Tesis Doctorales
Autor: Pablo E. Raya Castellano
ISBN: 978-84-1117-731-3
URI: https://hdl.handle.net/10481/80681

El doctorando D. Pablo E. Raya Castellano ha realizado la presente Tesis Doctoral Internacional como beneficiario de un contrato predoctoral para la Formación del Profesorado Universitario (FPU16/04651) en la convocatoria del año 2016. Duración: 03/09/2018 a 02/02/2023. Entidad financiadora: Ministerio de Universidades, Gobierno de España.

The PhD candidate Mr. Pablo E. Raya Castellano has conducted the present International Doctoral Thesis as a beneficiary of a predoctoral contract for Training Lecturing & Researching Personnel (FPU16/04651) at the 2016 call. Duration: 03/09/2018 a 02/02/2023. Funding organisation: Ministry of Universities, Spanish Government.

"Abre tus sentidos para no perderte nada de lo bello y hermoso que te rodea"

Pablo Picasso

"A PhD is like a bike ride in Sheffield. Lots of ups and downs on the road but you've got to keep pedalling"

Pablo Raya

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SUMMARY

SUMMARY

Coach behaviour research in football has grown over the last decades due to the believed influence that coaches are likely to have on players' thoughts, emotions, experiences, and overall learning (Cushion, 2010). A mixed-method approach combining systematic observations and interviews has typically been adopted for understanding *what* behaviours coaches use and *why* they use them. Indeed, studies in this area have generally concluded that coaches employ excessive 'instruction' during training or competition (Partington et al., 2014; Partington & Cushion, 2012), which has been deemed a detrimental approach for players learning motor skills (Ford et al., 2010). In addition, coaches have been observed utilising sporadic 'questioning' but this tends to constrain players' level of cognitive activity and does not provide players with enough time to reflect or elaborate responses (Partington & Cushion, 2013; Cope et al., 2016). Moreover, it has been argued that much of a coach's role occurs within 'off-field' environments (e.g., video analysis sessions or matchday team talks), with some calls suggesting the need to consider all situations in which coaches act as such (Cushion et al., 2012a; 2012b; Ford et al., 2009). Thus, as each coaching situation might entail various objectives and pursue different player outcomes, an effective utilisation of these behaviours might vary within 'on-field' or 'off-field' and 'in-week' or 'matchday' coaching environments.

With the purpose of promoting coaches' learning to skilfully utilise their behaviours and fulfil their sessions/talks' objectives, coach development programmes (CDPs) can be implemented. Coaches have been suggested to learn when new information match or fits their previous experiences and coaches adopt or adapt coaching approaches into their practice, respectively (Stodter & Cushion, 2017). However, this process might not be straightforward because of coaches' lack of awareness of their behaviours, and their flawed understanding underpinning behaviour (Partington & Cushion, 2013; Partington et al., 2014). Furthermore, it is also suggested that the tacit/unconscious nature of coaches' knowledge (Nash & Collins, 2006) can play a role in hindering effective incorporation of CDP content into coaches' practice. In fact, formal CDPs attempting to affect coaching practice have resulted in reduced knowledge development and very limited changes in coaches' behaviours (Stodter & Cushion, 2014; 2019). Therefore, considering the above antecedents, this Doctoral Thesis aimed to extend the existing understanding of the cognitive processes and behaviours employed by youth football coaches within various coaching environments and examine the CDP activities that are effective for facilitating changes in coaches' knowledge and behaviours during work-based CDPs.

The results and findings of this Doctoral Thesis demonstrated a prescriptive approach to coaching during video-based feedback sessions and half-time talks, portrayed by large volumes of instruction and/or feedback. Only selected coaches, typically working with younger age-groups (i.e., under 9, 10, and 13's), exhibited greater frequency of divergent questioning and enabled players to engage in player participation (i.e., meaningful talk) for longer durations. These player participation values were increased by some coaches during half-time talks (study II) by enabling players to debrief in the changing room while a staff meeting occurred on the pitch, that was intended to review first-half performance and prepare the half-time talk. However, during video-based feedback sessions (study I), participants showed three forms of 'epistemological gap', that were characterised by incongruent knowledge/beliefs about the suitability of player participation and actual player participation levels.

With the purpose of aligning coaching knowledge and behavioural intentions, study III assessed the impact that a work-based longitudinal CDP had on coaches' understanding about behaviour utilisation during post-match video-based feedback sessions. The CDP comprised a workshop, an experimentation task (i.e., to 'try out' new approaches within working context), and a reflective task that used coaches' own behavioural data to stimulate reflection. Indeed, both participants increased their understanding about the potential benefits and drawbacks of using silence, questioning, player participation, and feedback when watching specific video-based game sequences (i.e., clips). Whilst these findings provide some practical considerations for delivering video sessions, the CDP did also encourage coaches' acceptance of their own delivery approach or desires for change during future sessions. Specifically, coaches planned to structure their behaviours within each clip to attain sufficient player thinking and talking. These changes in coaches' intentions can be deemed a precursor stimulus for changing coaching practice, but study's III design did not verify whether actual changes in behaviour occurred.

Therefore, study IV examined the impact that a longitudinal CDP had on coaches' knowledge about questioning during training and whether this knowledge translated to a congruent application of questioning. The CDP required coaches to engage in a workshop, six experimentation sessions, and an on-line video-based reflective task. From the six coaches participating in this study, two of them only took part in the workshop and the experimentation sessions, whereas the remaining four were involved in the full process (i.e., workshop, experimentation sessions, and video-based reflection). Interestingly, all participants developed their knowledge about the instances perceived as more appropriate for asking questions, but only those coaches who undertook the complete CDP transferred their knowledge into a

congruent application of questioning. It is suggested that video-based reflective practice is essential for increasing the consciousness and availability of knowledge developed during CDPs. However, for coaches incorporating knowledge into their practice, reflection might need to be supported by tasks that involve opportunities to self-discover how to adopt this knowledge within a particular working context.

In summary, coaches demonstrated a willing to increase player involvement during 'off-field' video analysis sessions and half-time talks. Despite these intentions, most coaches typically exhibited a predominancy of 'instruction' and/or 'feedback', with only a few coaches increasing their values divergent questioning and enabling players to actively participate for considerable time. Thus, work-based CDPs including integrated experimentation and reflection opportunities can facilitate coaches' knowledge development about 'active learning' communication skills and its transference to actual behaviour execution.

RESUMEN

RESUMEN

La investigación sobre la conducta del entrenador en fútbol ha aumentado en las últimas décadas debido a la influencia que los comportamientos de los entrenadores pueden tener sobre los pensamientos, emociones, experiencias y el aprendizaje general de los jugadores (Cushion, 2010). Con el fin de entender *qué* conductas utilizan los entrenadores y *por qué* las utilizan, normalmente se ha adoptado un enfoque metodológico mixto compuesto por observaciones sistemáticas y entrevistas. Los estudios en esta área han concluido que los entrenadores generalmente utilizan una cantidad de 'instrucción' excesiva durante el entrenamiento o la competición (Partington et al., 2014; Partington & Cushion, 2012), la cuál se ha considerado perjudicial para el aprendizaje de habilidades motoras (Ford et al., 2010). Además, también se observó que los entrenadores utilizan 'cuestionamiento' de manera esporádica, pero que éste tiende a limitar el nivel de cognición de los jugadores y no los dota de suficiente tiempo para reflexionar o elaborar respuestas (Partington & Cushion, 2013; Cope et al., 2016). Por otra parte, una gran parte del rol del entrenador tiene lugar en contextos 'fuera de campo' (e.g., sesiones de análisis de vídeo o charlas en el día de partido), con algunas voces demandando la necesidad de considerar todas las situaciones en las que los entrenadores actúan como tales (Cushion et al., 2012a; 2012b). Por ello, dado que en cada situación el entrenador puede perseguir diversos objetivos y resultados para los jugadores, una utilización eficaz de estas conductas puede variar según el contexto ya sea 'en campo', 'fuera de campo', 'durante la semana' o en 'día de partido'.

Con el propósito de promover que los entrenadores aprendan a utilizar habilidosamente sus conductas y alcancen los objetivos de las sesiones/charlas, se pueden implementar programas de formación de entrenadores (PFEs). Investigaciones anteriores han propuesto que los entrenadores aprenden cuando la nueva información presentada en los PFEs coincide o encaja con sus propias experiencias previas y los entrenadores adoptan o adaptan esas estrategias de manera práctica (Stodter & Cushion, 2017). Sin embargo, este proceso puede no ser sencillo debido a la falta de consciencia de los entrenadores sobre sus comportamientos y a la comprensión limitada que poseen sobre la idoneidad de sus conductas (Partington & Cushion, 2013; Partington et al., 2014). También se ha sugerido que la naturaleza tácita/inconsciente del conocimiento de los entrenadores (Nash & Collins, 2006) puede dificultar que estos implementen los contenidos teóricos de los PFEs de manera práctica. De hecho, los PFEs formales que han pretendido modificar la conducta del entrenador han resultado en un desarrollo reducido de su conocimiento y cambios de conducta muy limitados

(Stodter & Cushion, 2014; 2019). Por tanto, considerando los antecedentes anteriores, esta Tesis Doctoral tuvo como objetivos ampliar la comprensión sobre los procesos cognitivos y comportamientos utilizados por los entrenadores de fútbol base en varios contextos en los que el entrenador actúa como tal, así como examinar las actividades de formación que son efectivas para facilitar cambios en el conocimiento y la conducta del entrenador durante PFEs desarrollados dentro del contexto de trabajo.

Los resultados de esta Tesis Doctoral demostraron un enfoque prescriptivo por parte de los entrenadores durante las sesiones de análisis de vídeo y las charlas de descanso, caracterizado por grandes cantidades de instrucción y/o feedback. Solo algunos entrenadores, normalmente trabajando con equipos de edades más jóvenes (i.e., sub-9, 10, y 13), emplearon una mayor frecuencia de preguntas divergentes y permitieron que los jugadores intervinieran (i.e., hablaran) durante más tiempo. Estos valores de participación del jugador fueron incrementados por algunos entrenadores durante las charlas de descanso (estudio II) permitiendo que los jugadores conversaran entre ellos en el vestuario, mientras el cuerpo técnico se reunía en el terreno de juego con el objetivo de analizar el rendimiento del equipo en la primera parte y preparar la charla de descanso. No obstante, durante las sesiones de análisis de vídeo (estudio I), los participantes mostraron tres formas de 'separación epistemológica' caracterizadas por conocimientos/creencias sobre la importancia de hacer partícipe al jugador, pero incongruentes con respecto a los niveles reales de participación del jugador.

Con el objetivo de alinear el conocimiento del entrenador con sus intenciones de comportamiento, el estudio III evaluó el impacto que un PFEs en el contexto de trabajo tuvo sobre la comprensión de los entrenadores en cuanto a la utilización de conductas verbales durante las sesiones de análisis de vídeo. El PFEs estuvo compuesto por una charla, una tarea de experimentación (i.e., "probar" estrategias dentro del contexto de trabajo) y una tarea de reflexión sobre datos de conducta verbal propios de los entrenadores para que estimulasen su reflexión. Así, ambos participantes aumentaron su comprensión sobre los posibles beneficios e inconvenientes de utilizar el silencio, el cuestionamiento, facilitar la participación del jugador y proporcionar feedback; al mostrar secuencias de vídeo de los partidos (i.e., cortes) a los jugadores. Aunque estos resultados proporcionan algunas consideraciones prácticas para la realización de sesiones de vídeo, el PFEs también fomentó que los entrenadores aceptaran su manera de llevar a cabo las sesiones o se animaran a modificar su comportamiento en sesiones futuras. En concreto, los entrenadores modificaron sus intenciones y reorganizaron el orden de estas conductas en cada corte para conseguir los objetivos de sus sesiones. Estos cambios en

las intenciones de los entrenadores pueden considerarse un antecedente al cambio de conducta, pero el diseño del estudio III no permitió verificar si los cambios de conducta realmente se consumaron.

En este sentido, el estudio IV examinó el impacto que un PFEs longitudinal tuvo sobre los conocimientos de los entrenadores en cuanto a la utilización del cuestionamiento durante entrenamientos y si este conocimiento se tradujo en una aplicación práctica relacionada. El PFEs supuso que los entrenadores asistieran a una charla, seis sesiones de experimentación, y una tarea de reflexión dialógica con vídeo. De los seis entrenadores que participaron en este estudio, dos de ellos únicamente participaron en el taller y en las sesiones de experimentación, mientras que los cuatro restantes completaron el proceso entero (i.e., también en la reflexión dialógica con vídeo). Curiosamente, todos los participantes ampliaron su conocimiento sobre los momentos percibidos como más apropiados para hacer preguntas, pero sólo los entrenadores que realizaron el PFEs completo transfirieron sus conocimientos a una utilización congruente del cuestionamiento. Esto parece indicar que la práctica reflexiva utilizando el vídeo es esencial para aumentar la consciencia y disponibilidad de los conocimientos adquiridos durante los PFEs. Sin embargo, para que los entrenadores empleen el conocimiento adquirido de manera práctica, la reflexión puede necesitar de tareas de experimentación de apoyo que les ofrezcan oportunidades para auto-descubrir cómo utilizar el conocimiento dentro de un contexto particular de entrenamiento.

En resumen, los entrenadores han demostrado su voluntad de que los jugadores estén más involucrados durante las sesiones de análisis de vídeo y las charlas de descanso. A pesar de estas intenciones, la mayoría de los entrenadores normalmente utilizaron predominantemente ‘instrucción’ y ‘feedback’ y sólo algunos entrenadores incrementaron sus valores de cuestionamiento divergente o permitieron a los jugadores participar activamente durante un tiempo considerable. Por lo tanto, los PFEs en el trabajo con oportunidades integradas de experimentación y reflexión pueden facilitar que los entrenadores desarrollen sus conocimientos sobre las habilidades de comunicación de ‘aprendizaje activo’, al mismo tiempo que transferirlos a su conducta.

INTRODUCTION

1. European Academy Development System

The vast commercialisation of football and its performance-oriented culture (Gammelsaeter & Jakobsen, 2008) have been suggested to influence the operating practices of professional football clubs. The European Union (EU) legislation and Bosman judgement, enabling free movement within the EU after termination of player contracts (Giulianotti, 1999), have boosted clubs to invest considerable funds in signing 'high profile' experienced players that can potentially improve short-term results and merchandise sales. This situation has led clubs to decrease the resources employed for developing indigenous youth players (Relvas et al., 2010) and, therefore, Football Governing Bodies have taken measures to encourage clubs to invest in for their academies.

Initiatives to support youth development were introduced by UEFA in the 2006/2007 season with the purpose of promoting home-grown talent. UEFA's ultimate objectives were to increase the transparency of European competitions and to re-establish the identity of local clubs by strengthening the services provided to youth local players (UEFA, 2005). This initiative was progressively launched and, for the 2008/2009 season, required a minimum of four players from their own academy and four others from the same national federation to be inscribed in UEFA competitions (UEFA, 2005). However, home-grown player was defined as an individual trained by the same club during at least three years between the ages of 15 and 21 regardless of their nationality (UEFA, 2019). In addition, this regulation made no recommendations regarding the services that players should be exposed to at earlier or later stages of development within football academies. Thus, some National Governing Bodies (NGB) have launched more 'club-interventionist' nationwide programmes investing considerable economic resources to increase the number of academy players gaining promotion to first team football (The Premier League, 2011; Deusche Fußball Liga, 2022).

To achieve an elite level in adulthood, academies typically configure a multidisciplinary environment intended to develop players' football-specific skills (Elferink-Gemser et al., 2012; Raya-Castellano & Fradua, 2015). In fact, a range of specialised practitioners (i.e., coaches, analysts, sport scientists, and psychologists) offer support to players to maximise their technical-tactical, physical, and personal capabilities (Cooper, 2021). Coaching provision is deemed a key element for enhancing youth players' quality and, with this purpose, the English and German federations have rearranged traditional formal coach education and professional development opportunities into more 'learner-centred' experiential activities (The Premier League, 2011; Deusche Fußball Liga, 2022). Nonetheless, NGBs have

not included any coach competency frameworks with recommendations for evaluating coaching. Hence, clubs seem to have been empowered to decide the criteria for considering the 'best' way to coach the variety of learners (i.e., players) training in pursuit of an elite level at their academies.

Considering that this Doctoral Thesis focuses on youth coaches, this section has highlighted the main intricacies surrounding the physical and organisational contexts of European football academies that can affect coaching processes. Moreover, as one of coaches' primary objectives is to facilitate players' learning of technical and tactical skills (Nesti & Sulley, 2015), the following subheading entitled 'Learning theories' has also reviewed and gathered the most recent theorisations seeking to explain how human beings learn. This literature is relevant to understand the potential impact that coaches' verbal communication skills might have on players' learning and considering findings about coaches in relation to what might be effective for players.

2. Learning theories

Over the past decades, there has been a shift of attention in coaching literature from examination of coaches' actions towards players, their learning, or how the coach can facilitate this process (Light & Clarke, 2021). Traditional assumptions about learning (i.e., behaviourism) in western societies have assumed that learning is linear and accumulative and have conceived learning as a process of internalisation of a pre-existing reality by the learner's mind (Varela et al., 1991). Conversely, more recent assumptions (i.e., constructivism) have adopted a more holistic view of learning that acknowledges a connection between the subject-learner and the object to be learnt or the importance of a joint mind-body and its sensations for learning (Light, 2008). Indeed, the main features of learning theories underpinned by the previous assumptions are described below.

First, behaviourism Learning Theory has dominated learning conceptions and educational processes during much of the twentieth century, and still have a strong influence on current teaching and coaching practices (Light, 2008). This theory suggests that behaviour learning occurs when a cognising agent interacts with the environment through conditioning (Light & Clarke, 2021). Indeed, whilst stimulus-response behaviourism theory conceives learning as a response to an environmental stimulus (Watson, 1913), Skinner's (1965) radical behaviourism argues that learning can only occur when learners' behaviours in response to

stimuli lead to rewarding or punishing consequences (Leeder, 2022). Hence, under this notion, knowledge is to be mentally internalised aided by a strict instructional teaching approach, and learning is deemed a passive process involving simple response-consequence associations (González, 2014; Whitebread, 2012).

Conversely, constructivism theories conceive learning and cognition through a holistic understanding where the mind and body are interrelated (Light, 2008). From this perspective, learning is complex and involves adapting and fitting into the environment through conscious and unconscious processes (Davis et al., 2000; Light & Clarke, 2021). However, over the last decades there have been a broad range of 'learning discourses' labelled as constructivist but that are contradictory in some respects (Light & Clarke, 2021). With this purpose, Davis and Sumara (2003) stated that, for ideas about learning to be considered as constructivist, they should understand learning as an adaptation and social or interpretative processes.

The psychological and social constructivism are accepted as the two main constructivist models. In the former, learners are meant to construct knowledge intra-personally by connecting their previous experiences and knowledge to new experiences and where exploration and discovery are emphasised (Piaget, 1970). Meaningful learning is expected to materialise when learners identify new relevant information about an unstructured situation and integrate it with previous knowledge structures, thus, constructing new meanings (Mayer, 2004; Chen & Rovegno, 2000). For making meaning of these unspecified situations, it has been proposed that learners engage in higher-order thinking skills (Mayer, 2004), that involve superior cognition levels than simple 'remembering' or 'understanding' (Bloom, 1956; Lorin et al., 2001). Furthermore, social constructivism advocates for more complex cognitions, understandings, and skills to emerge when engaging in social interaction. Following this perspective, language, dialogues, and discussions are integral to learning (Vygotsky, 1978; Bruner, 1990). However, the quality of social interactions and associated emerging cognitions seem to rely on the knowledge or ability of those peers an individual is interacting with. Indeed, Vygotsky (1978) highlighted the 'Zone of Proximal Development', which is defined as the space between a learner's problem-solving capabilities in isolation or when aided by a more capable peer. Thus, it is suggested that quality of 'peers' is a factor to consider for promoting more effective interaction.

Finally, Complex Learning Theory is formed by a combination of discourses related to social and psychological constructivist principles (Light & Clarke, 2021). According to this theory, knowledge can be effectively developed if learners engage in 'active learning' (Light & Wallian, 2008) either through intra- or inter-actions. In addition, these frameworks

acknowledge the notion of cognition occurring within both a sociocultural and historical or physical milieux (Kirk & MacPhail, 2002; Saito, 1996). For example, Lave and Wenger (1991) elaborated the conception of 'situated learning' suggesting that learning is likely to occur in daily life when participating in physical practices within specific social communities. Therefore, it is suggested that learning might arise from a complex interaction between the self (i.e., player), and between the self with others (i.e., coaches and players) and/or contexts (e.g., training practice or academy environment) (Gunn, 2001).

Having elaborated on the most renown theories of human learning, sections 3 and 4 review coach behaviour literature by examining the procedures of previous systematic observation studies and existing evidence of coaching within 'on-field' and 'off-field' environments. This evidence must be considered for ascertaining whether coaches' approaches and beliefs are grounded on assumptions concerning learning theories.

3. Systematic observations of youth football coaches

Coaches' behaviours are believed to have an influence on athletes' experiences, emotional responses, thoughts, and overall learning (Cushion, 2010; Partington et al., 2014). Since Tharp and Gallimore's (1976) pioneering work, systematic observations have described coaches' behaviours within different settings, attempting to identify the mechanisms that underlie expert coaching performance (Ford et al., 2009). Indeed, these studies have been conducted in a range of sports such as football, basketball, or volleyball, and mainly focussed on elite or developmental contexts (Cope et al., 2017).

Several validated systematic observation instruments, such as the Arizona State University Observation Instrument (ASUOI) (Lacy & Darst, 1984) or Coach Behaviour Assessment System (CBAS) (Smith et al., 1978) have been developed to analyse coach behaviour. However, the different behaviours and definitions in these tools have made it challenging to compare behaviour data across different settings and sports (Cope et al., 2017). In addition, these tools have been criticised for being employed without consideration of the setting, specific situation, and sport they were originally designed and validated for (Brewer & Jones, 2002). Moreover, some of the behavioural categories of the ASUOI such as 'silence' and 'questioning' have been criticised for not including further detail about the actual behaviour execution (i.e., type, timing, content, and recipient). Thus, Cushion et al. (2012a) used a five-stage approach to validate the Coach Analysis & Intervention System (CAIS) that

enables an in-depth examination of specific coaching behaviours within various contextual situations in various team sports (Cushion et al., 2012a).

It has been suggested that the CAIS has overcome some of the limitations of previous instruments. First, it includes further breakdown of primary behaviours that can be coded simultaneously; and second, these can be linked to secondary behaviours (i.e., timing, recipient, and content) (Cushion et al., 2012a). Furthermore, Ford et al. (2009) declared that to extend our understanding of coaching, everything a coach does should be captured, measured, and analysed. Previous observational research has mainly focussed on training sessions with some attempts to measure coach behaviour during 'on-field' competition. In fact, the CAIS was developed to include 'off-field' competitive states (i.e., pre-match, timeout, half-time, end-of-quarter, end-of-match), and the different training practices and transitioning states that can occur during training sessions. However, this tool did not consider video analysis sessions, a typical classroom-based coaching situation that involves video-based feedback and commonly used to develop players' game understanding (Groom et al., 2011).

Despite the CAIS having entailed a more comprehensive assessment of the context in which coach behaviour occurs, the validated instrument has been employed much less frequently than the modified versions (e.g., Grijalbo et al., 2022; Partington & Cushion, 2012). In addition, secondary behaviours have only been reported by Harvey et al. (2013) and, to our knowledge, no examination of coach behaviour has been conducted within specific 'off-field' competitive or in-training transition states. Therefore, it might be contested that the CAIS did not contain the appropriate characteristics for answering researchers' questions or, when amendments were made to primary behaviours, the instrument employed was a different tool to the validated CAIS (Cope et al., 2017).

The majority of coach behaviour research has examined coaches during training and competition, discussing the appropriateness of their employed behaviours (e.g., Ford et al., 2010; Partington & Cushion, 2012). Furthermore, there is a dearth of systematic observation studies in coaching conducted outside 'on-field' coaching environments or experimental research that has assessed the impact of context-specific coaching approaches. The following subsections will review the findings of studies conducted within training and competition or other under-researched environments.

3.1 Coaching behaviours during training & competition

Coach behaviour research using the ASUOI and CAIS has generally concluded that the most frequently employed coaching behaviour is 'instruction' (Partington et al., 2014). For example, Partington et al. (2014) reported up to 49.88 % of instruction for one coach during training, with this same behaviour averaging 33.29 % during competition (Partington & Cushion, 2012). Whilst these instruction levels have been criticised for not enabling players' to actively involve and problem-solve (Cope et al., 2016; Williams & Hodges, 2005), it has recently been suggested that instruction might not necessarily disempower active learning (Cope & Cushion, 2020). Instead, learning might occur when the learner can identify new information and connect it to previous knowledge (Mayer, 2004). Hence, sporadic coach instruction interspersed with periods of silence that effectively guide players to solve problems independently might also empower active and implicit learning (Cope & Cushion, 2020; Ford et al., 2010).

Coaches' use of silence has ranged from 4.98 % to 38.48 % in different systematic observation studies and can be viewed as both a positive or a negative coaching strategy (Partington et al., 2014; Vinson et al., 2016). When silence is unintentional, it can suggest limited coaching experience or skill (Jones, Housnes, & Kornspan, 1995). Conversely, deliberate silence has been highlighted as a tool for coaches analysing players' in-game performance and empowering players 'to learn for themselves' (Smith & Cushion, 2006, p. 361) instead of providing them with all solutions. Likewise, higher rates of silence have generally been reported during training form (i.e., technical-based) practices compared to playing form (i.e., game-based) activities (Ford et al., 2010; Harvey et al., 2013), which suggest greater facilitation for players to self-regulate during game-related activities. In addition, more prolonged silence periods following questions have been encouraged for players engaging in higher-order cognitions rather than self-answering and constraining learners' involvement (Cope et al., 2016). Thus, it is proposed that the pedagogical benefit underpinning the use of silence seem to be subject to other behaviours such as instruction or questioning.

The use of questioning as a coaching strategy has dominated the discussions of several coach behaviour research (e.g., Partington & Cushion, 2013; Partington et al., 2014) due to this behaviour representing an active learning alternative to direct instruction (Williams & Hodges, 2005). Indeed, coaches demonstrated very limited use of questions both in training and competition that fail to engage players cognitively (Partington et al., 2014). When asked, these have tended to be convergent (i.e., requiring limited response options) rather than divergent (i.e., requiring unlimited response options) (e.g., Harvey et al., 2013). Additionally, qualitative

conversational analysis exploring questioning beyond their frequency and type concluded that questions asked during training sessions did not enable players to reflect or elaborate their understanding and merely directed them to previously taught knowledge (Cope et al., 2016). However, it can be argued that the previous studies did not assess the contextual circumstances surrounding the use of questions and this is relevant when considering the suitability of varying questioning types.

There have been suggestions in the physical education literature that there is a better opportunity to ask questions between 'bouts of game play' (Harvey & Light, 2015). For example, Stonebridge and Cushion (2018) found higher questioning rates during management states (i.e., in-between training practices) and coaches with university education stated that this context included more appropriate conditions for generating discussions. Nevertheless, constant stops to training practices are believed to constrain players' opportunities to problem-solve (O'Connor et al, 2017). Thereby, O'Connor et al. (2020) have proposed practice continuity, only interrupted by occasional breaks within the same training practice that can involve questions. Moreover, with the objective of reducing the number of stops during large-sided games, coaches have been shown to approach players with no immediate potential intervention in the practice to ask them low-order thinking questions (O'Connor et al., 2021). Therefore, it is suggested that the appropriateness of a convergent or divergent question and the extent to which it can enhance learning can be determined by its timing.

4. Evidence on coaching during 'off-field' environments

4.1 Coaches' use of video-based feedback

Coaches' limited capabilities for retaining game events (Franks & Millers, 1986) have encouraged the incorporation of performance analysis (PA) services into the coaching process. In addition, the global technological development in modern societies and particularly within the sport science industry (Giblin et al., 2016) have made PA more accessible for coaches and players all over the world (Dancs, 2020). Indeed, PA is deemed a tool that can support coaches' understanding of performance (Peters & O'Donoghue, 2013) and have been suggested to develop players' game-knowledge and decision-making (Groom et al., 2011; Reeves & Roberts, 2013). However, Groom et al. (2011) argued that the processes coaches and analysts employ to transmit this information to players in addition to the pedagogical considerations underpinning video-based feedback practice have been overlooked.

Since the study of Groom's et al. (2011), considerable progress has been made in this field. For example, Wright et al. (2013) surveyed forty-eight first team and academy analysts responsible for conducting pre-, post-, and live analysis, and nearly 73 % of respondents indicated that they did not deliver the feedback sessions. This was typically performed by the manager (62.5 %), assistant manager (31.5 %), first team coach (18.9 %) or youth team manager (20.8 %), youth team assistant manager (12.5 %), and youth team coach (16.7%). Similarly, 86 %, 82 %, and 73 % of professional and semi-professional coaches from various invasion team sports (n = 46) affirmed employing edited clips of the game to provide feedback to the whole group, individually, or small groups of players, respectively (Wright et al., 2012).

This area of research has also explored the pedagogical intricacies that coaches might encounter when delivering video analysis sessions through qualitative interviews. Indeed, Groom et al. (2011) recommended a balanced use of positive and negative sequences to prevent players losing confidence and self-esteem. Whilst Groom and Cushion (2005) proposed a 1:1 ratio of positive and negative sequences, they also acknowledged that a 2:1 ratio could be applied when players were experiencing lack of confidence. Nevertheless, coaches working with female athletes have been shown to focus video sessions on their weaknesses (Loo et al., 2020) and no intervention study has evidenced the impact of these positive-negative ratios on players' outcomes.

Context (e.g., previous match scores, player circumstances) seem to be critical for adapting the positivity or negativity (i.e., valence) of video sessions. Whilst players have been shown to perceive PA positively, they seem to be more reluctant to receive such information when recent poor performances have occurred (Reeves & Roberts, 2013). Specifically, some players have reported reluctance to be reviewed individually in front of their teammates when performance is below the standard (Nelson et al., 2014), expressing demoralising feelings (Fernández-Echeverría et al., 2019), and a decrease in engagement and concentration (Middlemas & Harwood, 2018). Hence, adapting the valence of video sessions to players' individual recent performance seems to be critical for achieving athletes' engagement and so they retain the key messages.

Another topic regarding coaches' video-based feedback delivery that has received attention is the extent to which players actively participate (i.e., talk, ask questions, etc.) during video sessions. Players have declared greater understanding and learning within sessions that involve higher discussion opportunities (Wright et al., 2017) but have outlined clear talking turns needed to avoid player-led discussions becoming chaotic (Loo et al., 2020). However, such player participation has been shown to be reduced and asymmetrical with the coach using

questions to individuals that reinforced their own messages and controlling the topic of discussion (Groom et al., 2012). Further, Booroff et al. (2016) demonstrated that video-based feedback practice within elite academy football can be utilised politically to prove fulfilment of responsibilities rather than supporting players' needs. Therefore, examining the full spectrum of coaching behaviours within this environment can encourage initial discussion and reflection upon the delivery of video-based feedback.

4.2 The impact of coaches' match-day talks on players

'Off-field' coaching environments have been classified into non-performance states outside (i.e., pre-match and end-of-match) and inside (i.e., timeout, half-time, and end-of-quarter) competition (Cushion et al., 2012a). Indeed, these periods have been suggested to offer more appropriate opportunities to affect players' performance than the actual game due to the multiple stimulus surrounding players 'while the ball is rolling' (Mouchet et al., 2014; Mason et al., 2020). For example, Lorenzo et al. (2013) found that basketball coaches employed more questions and complex instructions during game-breaks (i.e., timeout, half-time, and end-of-quarter) compared to the game. Thus, following Trudel's et al. (1996) suggestion than some coaching contexts might provide more 'teachable moments' than others, it is argued that the same might apply for match-day team talks when compared to the actual game.

At pre-match, coaches typically bring together the full 'called up' squad with the primary objectives of recalling the game strategy and providing the last emotional words to players before entering competition (Vargas & Guan, 2007; Vargas, 2009). Whilst no new messages are normally transmitted during these meetings (McKenna, 2021) and athletes retain limited pre-match information (Mesquita et al., 2008), the amount of information provided by coaches has been shown to predict the perceived self-efficacy and functional emotions of football players (Vargas, 2009). Conversely, football players have also reported higher team-efficacy (Vargas & Bartholomew, 2006), emotional dominance, and inspiration to perform (González et al., 2011) after simulated emotional pre-match talks compared to strategically focussed or control talks. Moreover, pre-match talks seem to be a coaching environment with potential for happiness contagion from coach to players due to coaches' emotional expressions not competing with other dynamics between teams once the game starts (Van Kleef et al., 2019).

On the other hand, half-time has been highlighted as the only game interruption enabling a prolonged interaction with players in football (Zach et al., 2022). When considering

that this sport does not involve timeouts or end-of-quarters breaks, half-time periods might be deemed of greater importance due to these being a unique 'off-field' meaningful coaching occasion within every game to influence players. It has been suggested that the challenge for effective management during half-time talks has to do with analysing immediate game events, planning the talk, and addressing players effectively (Allain et al., 2018). Half-time talks tend to be monological, with coaches predominantly including solution messages, comments about performance (Madden, 1995), and criticism (Avugos et al., 2018). However, coaches' behaviours during this situation have also been shown to be modified as a function of the score. For example, coaches have been observed being more positive during winning game-breaks (Madden, 1995; Halperin et al., 2016), and increasingly negative and psychological during losing intervals (Halperin et al., 2016; Zach et al., 2022). Additionally, coaches' emotions within this environment are relevant not only because a potential coach to player anger contagion, but also due to players perceiving that coaches' happiness and anger are related to better and worse team performance, respectively (Van Kleef et al., 2019).

Considering the above antecedents, understanding coaches' full spectrum of behaviours employed to affect players within these environments becomes relevant. Nonetheless, little research has examined coaching during match-day talks. When conducted, studies have mainly addressed the perceived psychological effects of pre-match and half-time talks on players (e.g., Vargas, 2009; Van Kleef et al., 2019). Only a few attempts specifically focussed on half-time talks qualitatively (Avugos et al., 2018; Allain et al., 2018; Mouchet et al., 2014); and the few quantitative studies conducted, explored the predominant behaviours exhibited during timeouts, half-time, and end-of-quarter jointly (Madden, 1995; Lorenzo et al., 2013).

The above findings mainly evidence the psychological effects of coaches' talks and non-verbal expressions on players. Only a few studies have provided very vague pictures of coaching within matchday-talks (e.g., Avugos et al., 2018). Hence, exploring coaches' complete verbal activity can enhance understanding on how coaches manage these situations and enable the design of quasi-experimental studies assessing the effects of more realistic coaching interventions on players.

5. Mixed-method research and coaches' knowledge

Coaching has been described as "the combination of thought with action" (Partington et al., 2015, p. 701). Whilst coaches' behaviours are overt to direct observation, thoughts have

been shown to be imperceptible under this same procedure (Clark & Peterson, 1987; Cushion et al. 2012b). Therefore, the use of systematic observation *per se* might not enable understanding of the contextual factors influencing coaches' behaviours and qualitative interviews has been incorporated to systematic observation to fulfil this limitation (Harvey et al., 2013). This mixed-method approach to research has become a common way to assess coaching, with calls being made to consider the interaction between both behaviour and underpinning knowledge jointly rather than employing both methods in isolation (Cushion et al., 2012b).

Mixed-method research in coaching has demonstrated an 'epistemological gap' between coaches' behaviour and their underpinning knowledge (Partington & Cushion, 2013). For example, Partington and Cushion (2013) examined the training sessions of eleven elite youth coaches who affirmed intending to develop skilled 'decision-makers', but they lacked knowledge about the practice rationales for developing this type of player. Likewise, Partington et al. (2014) interviewed youth coaches who predominantly employed convergent questions, but they were unable to describe the potential benefits associated with the use of divergent questions. Moreover, Davis and Sumara (2003) define 'epistemological gap' or 'cognitive dissonance' as the use of teaching-related vocabularies underpinned by flawed understanding, which have been suggested to lead to a non-pedagogical coaching practice (Light, 2008). Hence, in both scenarios, flawed understanding seems to be the reason for coaching approaches and underpinning knowledge being disconnected.

Expert coaches have been suggested to access their cognitive structures to make immediate decisions but can often be unable to articulate their utilised knowledge declaratively (Nash & Collins, 2006). This has been suggested to occur due to much of their knowledge being gained during day-to-day experiences and becoming tacit or unarticulated after time (Watts and Cushion, 2016). As Berger and Luckmann (1966) have highlighted, very reduced fragments of experience can be remembered consciously and, therefore, initially consciously learnt coaching approaches will be typically operated without being subject to scrutiny of their suitability (Cushion & Partington, 2016). Likewise, Nash and Collins (2006) suggest that certain cues might appear during practice that enable coaches to link them to past experiences and produce immediate decisions. Thus, although coaches' actions appear intuitive for external observers, they seem to emerge from a combination of knowledge and memory acquired in previous similar situations and refined over the years.

This section has delved into the nature of coaches' knowledge guiding their actions during practice. As a continuation, the following section examines: (1) the rationales for the

limited impact of formal Coach Development Programmes (CDPs) on developing coaches' knowledge and changing behaviours and (2) which CDP tasks might be more effective for attaining these outcomes.

6. Coach Education & Development

6.1 Coaches' learning & formal coach education.

A primary aim of coach development literature is to deliver more effective coach development programmes (CDPs) that facilitate practitioners' growth (Griffiths et al., 2016). Indeed, coaches have been shown to learn through formal (i.e., accreditation courses), non-formal (i.e., workshops, talks), and informal (i.e., day-to-day experience) modalities that frequently occur in combination throughout coaches' careers (Colley & Malcom, 2003). Whilst formalised CDPs have been scrutinised for being de-contextualised from coaches' working contexts and existing knowledge levels (Stodter & Cushion, 2017), the informal mode has been highlighted as a more effective form of coach learning (Watts & Cushion, 2016; Cushion & Nelson, 2013). Nonetheless, formal CDPs seem to be constructed without full consideration about the mechanisms underpinning coaches' learning.

It has been proposed that coaches learn by planning strategies and continuously experimenting, adapting, and evaluating with them (Gilbert & Trudel, 2001). This process has been denominated as the reflective feedback loop process where coaching approaches are constantly refined until effective transference of knowledge into practice is achieved. Thus, when new concepts from formal CDPs are presented to coaches, these have been suggested to be adopted or rejected if they match or mismatch coaches' existing knowledge structures, respectively (Stodter & Cushion, 2017). In addition, CDPs' contents might also fit coaches' knowledge and be adapted or rejected depending on their perceived applicability within coaches' working environments (Stodter & Cushion, 2017). Nevertheless, Stodter and Cushion (2016) have argued that coaches are typically provided with little opportunities for innovating or experimenting with alternative coaching strategies within their working environments.

Formal CDP courses have been shown to engage coaches in very limited time of practical coaching (1.9 %), with the most frequent activity consisting of observing a colleague coaching while being involved in their practice (55.8 %) (Stodter & Cushion, 2014). Moreover, formal CDP's classroom-based tasks have been scrutinised for involving limited engagement from coaches due to these typically consisting of 'filling in' activities that are required to be

completed in a defined order and timeframe regardless of individual learning needs (Cushion et al., 2021; Dempsey et al., 2020). Such approaches have promoted limited development of coaches' knowledge and no changes in behaviour (Stodter & Cushion, 2014; 2019). Only Jones et al. (2012), in their formal postgraduate CDP with eight student coaches involving group reflection and opportunities to apply knowledge in-context, demonstrated improved understanding and philosophy of practice. However, there is limited evidence suggesting whether these activities (i.e., reflection and experimentation) in isolation or combination can be effective for affecting coaches' behaviour change.

6.2 Developing coaches' knowledge & changing their behaviours.

After prolonged coaching experience, coaching knowledge that is initially learnt consciously is suggested to become tacit and guide action through unconscious processes (Watts & Cushion, 2016; Cushion, 2016). Indeed, to increase the consciousness of coaches' knowledge guiding their behaviours, it has been recommended that they engage in reflective practice (i.e., reflection) (Gilbert & Trudel, 2001). However, Cushion (2016) argues that reflection should elude justification or rationalisation of practice that concur with the dominant culture of organisations, because this results in 'imposing modes of thinking' rather than facilitating coaches' learning and self-defining their working identities. Hence, the positionality that coach developers adopt and the power relationship between stakeholders (i.e., coaches and coach developers) in the development process is a relevant aspect to be considered (Cushion et al., 2017; Chapman et al., 2019).

Several studies have explored the impact that video-based and/or a coach developer's 'dialogical' reflection have on coaches' CDP experience, knowledge development, and changes in their behaviours (Cope et al., 2020; Partington et al., 2015). For example, Stodter et al. (2021) highlighted that, participants taking part in a 12-week study involving online video-based reflective practice and an experienced coach developer's 'dialogical' action had been very valuable. Specifically, coaches provided considerable merit to the coach developer's balanced positionality and use of questioning, because it encouraged coaches' reflections to be more critical and enabled these to be focussed on relevant aspects of their own coaching practice. Moreover, Cope et al. (2020) purposively sampled three coaches for a 3-month CDP in which an external coach developer empowering and caring for learners (i.e., coaches) supported them with reflective conversations intended to enhance their reflective criticality. The CDP experience was positively perceived among coaches and decreases in their technical

practices, direct management, feedback, and convergent question and increase in total questioning rates were also observed.

Furthermore, Partington et al. (2015) engaged five coaches in a 3-year CDP involving attendance to the FA Youth Award, sporadic conversations with a FA coach educator, and video-based reflective practice about their behaviours. Whilst participants changed their application of instruction, feedback, silence, and questioning, they also stated that reviewing videos of their coaching practice enhanced their objectivity and, thus, their willingness to change certain undesirable behaviours. These found 'discoveries' or 'disturbances' are defined as contradictions between coaches' intentions and actions and are viewed as opportunities for changing coaching practice (Voldby & Klein-Døssing, 2019). Therefore, it is proposed that coach developers can find potential future 'discoveries' in coaches' practice and include them in reflective practice sessions with the objective of increasing the consciousness and availability of the underpinning knowledge (Stodter & Cushion, 2017). However, it is yet not fully understood how experimentation tasks can complement reflection and lead to a more effective translation of coaching knowledge into associated behaviours.

6.3 Self-Determination Theory and its application to coach development

Self-determination Theory (SDT) is a motivational theory that attempts to provide response to the rationale of why an individual decides to involve in a particular activity (Deci and Ryan, 1985; 2000). This framework proposes that human beings engage in their environments seeking self-growth and fulfilment of their innate basic psychological needs (Deci & Ryan, 2000). These comprise the needs of autonomy (i.e., freedom to choose and execute the own behaviours), competence (i.e., feeling capable of producing desired outcomes), and relatedness (i.e., being connected and bonded with others) (Deci & Ryan, 2000). Thus, when these three needs are completed, an individual can become self-determined in their motivation (i.e., intrinsically motivated) (Deci & Ryan, 2000).

According to Deci (1975) and Deci and Ryan (1985) intrinsic motivation is only possible at early ages (e.g., lactation) of life because since an individual becomes more mature and develops reasoning capabilities, other extrinsic incentives gain importance. Indeed, Ryan and Deci (2000a) developed a continuum of motivation modalities ranging from 'Amotivation' (i.e., absence of motivation) to 'Intrinsic motivation' (i.e., involving satisfaction for inherent aspects of the activity). The middle extrinsic motivation level is composed of four regulations (i.e., external, introjected, identified, and integrated) that, in descendent order, increase their

autonomy levels. For example, whilst 'external regulation' refers to executing behaviours to achieve or elude positive or negative external outcomes; under the 'introjected regulation', individuals engage in an activity to avoid the blame or anxiety feelings produced for not accomplishing an internal rule (Deci & Ryan, 2000). Moreover, 'identified' and 'integrated' regulations have been suggested to occur when finding value in an activity for constituting an external benefit (Ntoumanis, 2001) and when the activity is linked to the lifestyle and associated values, goals, or identity of the individual (Deci and Ryan, 2000), respectively.

There have been calls suggesting that when individuals' basic psychological needs are fulfilled or at least not thwarted, this can lead to self-determined motivation (Ryan and Deci, 2000b). This can be due to the basic psychological needs being essential mediators of the motivators of individuals to engage in certain activities (Balaguer et al., 2008). In the context of coach development, it has been suggested that the objective of coach education courses is to promote critical-consciousness and dialogue rather than oppressing learners' individual agency (Chapman et al., 2019). Similarly, Cope et al. (2020) reported that participants identified freedom to learn (i.e., autonomy-support) and the feeling of care from the coach developer (i.e., social relationships-support) as critical aspects for their engagement. Therefore, it is argued that the degree to which individuals' basic psychological needs (i.e., autonomy, competence, or relatedness) are supported or thwarted might determine coaches' level of involvement in educational activities due to their underpinning motivators.

OBJECTIVES

GENERAL OBJECTIVES:

The overall objectives of this Doctoral Thesis were: (1) to enhance understanding of the behaviours employed by youth football coaches within various coaching environments and their underpinning cognitive processes and (2) to expand knowledge about the coach development activities that are effective for facilitating changes in coaches' knowledge and behaviours.

SPECIFIC AIMS:

The specific aims of this Doctoral Thesis were grouped into the following chapters:

- **Chapter 1: Analysing coaches' behaviours within various coaching environments.**
  - Specific aim 1: To appraise youth coaches' behaviours and their underpinning cognitive processes during video-based feedback sessions (Study I).
  - Specific aim 2: To critically examine youth coaches' behaviours and underlying perceptions during their half-time talks (Study II).
  - Specific aim 3: To consider youth coaches' knowledge about behaviour utilisation during post-match video-based feedback sessions (Study III).
  - Specific aim 4: To assess youth coaches' understanding about the instances during training sessions perceived as better opportunities for asking questions (Study IV).
- **Chapter 2: Developing coaches' knowledge underpinning behaviour utilisation and affecting the knowledge-behaviour transfer.**
  - Specific aim 5: To understand the impact that reflective and experimentation tasks can have on coaches' knowledge about their practice over time (Study III).
  - Specific aim 6: To expand knowledge about the impact that reflection and/or experimentation tasks can have over time on coaches' translation of knowledge about questioning timing into a congruent application (Study IV).

MATERIALS & METHODS

1. Research context

This Doctoral Thesis was conducted within two European football academies. Study I was carried out within an English *Premier League* Club academy whilst studies II, III, and IV involved a Spanish *La Liga* Club academy whose first team was promoted from the second division (i.e., *La Liga* 123) to the first division (i.e., *La Liga Santander*) during the data collection period.

The English academy was classified as a category-one academy within the Elite Player Performance Plan (EPPP) initiative, whose ultimate objective is to increase the quantity and quality of home-grown players (The Premier League, 2011). As per EPPP guidelines, the performance pathway was structured into three phases: A Foundation Phase (under 6-11's), Youth Development Phase (under 12-16's), and Professional Development Phase (under 17-23's). All teams in the Foundation and Youth Development phases played friendly fixtures and all academy teams were developed within a training ground in common with the first team. The academy and first team departments were physically separated with only the under 23 players and staff sharing training and building areas with the professional team. All lead academy coaches were employed full-time, which involved complete dedication to their age-group on a permanent contractual basis.

The Spanish academy distributed their performance pathway into a 7-a-side phase (under 9-12's), an 11-a-side development phase (under 13-16's), and 11-a-side performative phase (under 18-19's). The ten, academy age-groups, played competitive games against regional teams and other elite academies within the highest possible league category. The first team department was composed of a first team and a reserve team who shared the training ground during the morning time. The rest of academy age-groups trained and competed at external facilities, with older age-groups having occasional access to the training ground in the evenings. Most of the staff at the academy were employed part-time on a fixed-term basis and typically hold other professional occupations within different organisations. Only the Academy Manager, Head of Methodology, and under 19 Lead and Assistant coaches were hired on a full-time basis. Thus, except this age-group, most coaches working hours involving training, gym, or video sessions occurred during the evenings of in-week days.

2. The Pragmatic paradigm and selection of a suitable method of research

A paradigm can be defined as a framework comprising beliefs and assumptions about reality that guide research and influence how knowledge is interpreted (Weaver, 2018). Indeed, paradigms not only enable researchers to agree on relevant research questions to be answered, but also to identify the most appropriate ways to answer these questions (Kuhn, 1962). For example, Gliner and Morgan (2000) have argued that paradigms involve thinking about research, the accomplishing process and method of implementation. Thus, as researchers may possess different assumptions about the nature of truth, knowledge, or its acquisition; several paradigms holding varying ontological and epistemological worldviews have been developed over the years.

For example, positivism claims that the world exists in an objective way, whereas interpretivism supports the notion that world can be interpreted subjectively and relies on individual's previous experiences (Zukauskas et al., 2017). Following these views, the role of the researcher will vary from an objective analyst of reality separated from personal values, in the former case; to an observer of the social world that originates in every knower's particular mind, in the latter case (Zukauskas et al., 2017; Turyahikayo, 2021). Conversely, pragmatism combines both assumptions suggesting that although there is an objective reality, it can only be accessed through human experience (Morgan, 2017). Specifically, pragmatists argue that knowledge is a situated and social accomplishment, because it entails direct immersion in a situation of concern (James, 1912) and older 'more experienced' generations might have transmitted their views of the world to younger 'less experienced' individuals (Simpson, 2019).

As pragmatism is traced to intellectual movements during the mid-nineteenth century (Bernstein, 1972), its discourses are concerned on the outcomes of action rather than reality or truth (Morgan, 2017). According to pragmatists, reality is actively created and developed by individuals attempting to solve practical problems. In addition, truth is deemed 'what works' at a given time rather than a pre-established (e.g., postpositivist paradigm) or independent (e.g., constructivist paradigm) reality perceived by the mind (Weaver, 2018). Therefore, following this pragmatist notion, research inquiry is seen as a form of experience that can lead individuals to solve the uncertainty of situations without clear solutions (i.e., doubts) into more determinate situations (Dewey, 1938; Simpson, 2019).

Considering that this paradigm embraces a form of naturalism (i.e., philosophy and science occur simultaneously), pragmatists are keen on employing methods typically adopted by research from different paradigms (Weaver, 2018). Positivist and interpretivist paradigms

have embraced the use of a limited number of isolated quantitative and qualitative methods, respectively (Zukauskas et al., 2017). Indeed, Johnson and Onwuegbuzie (2004) have argued that quantitative, qualitative, and mixed-method research can be superior to each other and claim that researchers must assess intricacies of the research prior to selecting a specific method. Hence, combining quantitative and qualitative data in the form of mixed-method research has gained support as an appropriate approach for integrating different worldviews because of the pragmatist principle of mutual relevance of both objective and subjective realities.

This Doctoral Thesis followed the ideas underpinning the pragmatism paradigm and adopted a mixed-method approach for capturing coaches' behaviours and cognitions. A summary of the most relevant data collection characteristics of the present Doctoral Thesis are summarised in Table I. For further methodological information regarding any of the studies, please review the method sections of the corresponding articles.

Method Table. Summary of the data collection characteristics of the Doctoral Thesis.

Article	Methods	Coaches		Procedure			
		Number (Gender)	Age-groups	Observational data		Qualitative interviews	
I. Analysing coach behaviour during video-based feedback sessions	Mixed methods	4 (Male)	U13, 14, 15, & 16	-4 habituation sessions -22 coded sessions (totalling 459,18')		-2 pilot interviews -4 interviews (range: 36'52" to 52' 40")	
II. Analysing coach behaviour during half-time talks	Mixed methods	5 (Male)	U10, 13, 14, 15, & 18	-5 habituation sessions -20 coded half-time breaks (totalling 183,72')		-1 pilot interview -5 interviews (range: 46'18" to 61'43")	
Article	**Methods**	**Coaches**		**Procedure**			
		Number (Gender)	**Age-groups**	**Pre-/debrief phase**	**CDP activities**	**Post-/reflective phase**	**Consolidation**
III. Developing coaches' knowledge underpinning behaviour utilisation during post-match video-based feedback sessions	Longitudinal mixed methods	2 (Male)	U9 & 13	<u>Observational data:</u> -2 habituation sessions -10 coded sessions (182,33') <u>Qualitative interviews:</u> -2 interviews (range: 10'22" to 11'40")	-1 workshop - 2 sessions/coach to experiment -Behavioural data dissemination & 1 reflective interview/coach to reflect*	<u>Qualitative interviews:</u> -1 pilot interview -2 interviews (range: 44'15" to 44' 26") *.	<u>Qualitative interviews</u>: -1 pilot interview -2 interviews (range: 67' 33" to 73'18").
IV. Affecting the knowledge-behaviour transference during training sessions	Longitudinal mixed methods	6 (Male)	U9, 10, 12, 13, 14, & 15	<u>Observational data:</u> -6 habituation sessions -24 coded sessions (1811') <u>Qualitative interviews:</u> -1 pilot interview -6 interviews (range: 24'24" to 30'42")	-1 workshop -6 sessions to experiment/coach -8 reflective clips x 4 coaches	<u>Observational data:</u> -24 coded sessions (1678') <u>Qualitative interviews:</u> -1 pilot interview -6 interviews (range: 31'42" to 45'24")	<u>Qualitative interviews</u>: -1 pilot interview -5 interviews (range: 48'54" to 72'18")

*Study III's interviews are recorded under 'CDP activities' and 'Post-/reflective phase' as they served as both a CDP activity and a data collection point.

RESULTS & FINDINGS

Chapter 1: Analysing coaches' behaviours within various coaching environments

STUDY I:

- Specific aim 1: To appraise youth coaches' behaviours and their underpinning cognitive processes during video-based feedback sessions.

INTERNATIONAL JOURNAL OF PERFORMANCE ANALYSIS IN SPORT
2020, VOL. 20, NO. 4, 729–746
https://doi.org/10.1080/24748668.2020.1782717

An exploratory investigation of junior-elite football coaches'' behaviours during video-based feedback sessions

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ABSTRACT

Despite the growing qualitative research examining the complexities underlying the delivery of video-feedback, no study has yet explored coaches' actual behaviours within this environment. Thus, this study aimed to explore junior coaches´ behaviours and their underlying rationales during team-based video-feedback. Twenty-two in-season sessions delivered by four junior-elite coaches were filmed and analysed. Following previous studies and advised by a panel of experts, the tool employed was adapted from the Coach Analysis and Intervention System and the Arizona State University Observation Instrument, to represent the study context. Subsequently, semi-structured stimulated recall interviews were conducted to elucidate coaches´ thinking, understanding, and rationalising of their behaviours. Data indicated a prescriptive approach to coaching within the video-feedback environment. Feedback was the most employed behaviour of all coaches, followed by silence, player participation, convergent, and divergent questioning. One coach had player participation as their second most utilised behaviour. Findings demonstrated varied levels of understanding for each coach and evidenced three different types of cognitive dissonance or epistemological gap between coaches´ behaviours and understanding. Therefore, future coach development programmes, specific to video-based feedback, would need to consider each individual coach baseline behaviour and cognitions before intervening.

ARTICLE HISTORY
Received 13 May 2020
Accepted 11 June 202

KEYWORDS
Coaching; learning; analysis; tactical knowledge; performance; soccer

1.1 Background

The incorporation of performance analysis into the coaching process has facilitated coaches' delivering video-feedback sessions to enhance players' game-knowledge and decision-making (Wright et al., 2013; Groom & Cushion, 2005). Whilst the motor learning literature discourages wholly prescriptive approaches to coaching, it is not fully understood how feedback can be integrated into video-based sessions to enhance player learning (Williams & Hodges 2005; Nelson et al., 2014). For example, previous studies have highlighted the shortcomings of sessions focused on negative performances and feedback targeted at individuals (Groom et al., 2011; Nelson et al., 2014). In addition, sessions where players actively participated (e.g., engaged in meaningful discussion) have been suggested to offer greater learning opportunities (Wright et al., 2016). However, there have been no attempts to consider coaches' behaviour and their underpinning pedagogic principles within this learning environment.

Constructivist learning theory asserts that knowledge is more effectively developed when learners are active participants in the process (Davis & Sumara 2003; Prince, 2004). It is suggested that social interaction provides a basis for a richer understanding of reality and more meaningful learning is achieved when learners engage in an appropriate cognitive activity (Light, 2008). Cognitions can range from lower to higher order thinking skills (i.e., remembering, understanding, applying, analysing, evaluating, and creating) and these higher levels can serve to provide richer meaning to situations (Lorin et al., 2001; Mayer, 2004). Moreover, metacognition or knowledge about a cognitive phenomenon, composed of knowledge (i.e., declarative, procedural, and conditional) and regulation (i.e., planning, monitoring and evaluations), might play a role in superior expertise (Mahdavi, 2014). It is suggested that experts continually plan, monitor, and evaluate when performing skills (i.e., action) or tactically (i.e., cognitions) preparing for performance (Coughlan et al., 2014; Roca et al., 2013; Horrocks et al., 2016).

Coach behaviours can influence players' affective responses, cognitions, and learning (Partington et al., 2014). For example, while augmented feedback allows learners to compare actual and desired performance, high volumes of explicit information can create learner reliance on this type of feedback and elude engagement with the problem-solving process (Krenn et al., 2013; Williams & Hodges, 2005). Therefore, questioning has been proposed as an alternative to encourage implicit learning as it can stimulate player thinking, promote self-analysis, and facilitate knowledge verbalisation (Chambers & Vickers 2006; Vickers, 2007; Cazden, 2001). There are two broad types of questions that can be asked: (1) convergent; which

constrains response options and typically encourages lower-order thinking skills such as information recall and (2) divergent; which provides unlimited options and demand the use of higher-order thinking skills (Harvey & Light 2015).

Individual questioning that encourages focused attention on specific aspects of a video has been effective for developing players´ tactical-knowledge and decision-making. For example, García-González et al. (2013) filmed eighteen tennis games, with the first and last four recordings used as pre- and post-test and the middle ten games used for the intervention. At pre- and post-test, tactical-knowledge and decision-making levels were captured by interviewing players on court and through an observational instrument that analysed their performance. The intervention (24 hours post-competition and preceding the first training session of the week) involved the experimental group self-reflecting on three successful and unsuccessful video clips, followed by questioning from the researcher. Pre- and post-test comparison of the recall planning interview and video analysis demonstrated a more sophisticated problem representation and planning strategy (i.e., increased goal, action, and regulatory concepts), and improved decision-making when compared to the control group. Therefore, video-feedback supported by questioning seemed to enhance athletes' ability to evaluate game scenarios and make improved decisions.

Studies of junior-elite football coaches have identified instruction as one of the most employed behaviours, during training and games (Ford et al., 2010; Smith & Cushion, 2006). It has been argued that the Arizona State University Observation Instrument (ASUOI) has been employed without critical consideration of the context, sport or situation in which coach behaviour occurred and therefore it is not sufficiently sensitive (Brewer & Jones, 2002; Cushion et al., 2012a). These criticisms have led to the development of new observation tools, such as the Coach Analysis and Intervention System (CAIS) (Cushion et al., 2012a), intended to better isolate specific behaviours and/or practice types training and competition states. However, this tool only considered narrow elements of coaches' role - competition and 'on-field' training; it failed to take into consideration performance analysis/feedback sessions, strength and conditioning training; and other situations where coaches 'intervene' with their athletes.

Furthermore, coaches present limited awareness of their behaviours and a 'cognitive dissonance' or 'epistemological gap' between behaviour and knowledge due to the acquisition of teaching-related vocabularies underpinned by flawed understanding (Partington & Cushion, 2013; Davis & Sumara, 2003). During video-feedback, coaches' cognitions and behaviours are not underpinned by learning implications as suggested by Light (2008). For example, Booroff

et al. (2016) interviewed a youth lead coach and reported that sessions were used strategically to prove completion of their academy management obligations rather than focusing on the players' needs. Moreover, Groom et al. (2012) systematically analysed coach and player interactions during six team-based video-feedback sessions and reported that the coach reinforced their authority by controlling the topic and opportunities for player participation. Therefore, the aims of this study, were to observe, classify, and quantify the behaviours of junior-elite football coaches during team-based video-feedback sessions and to explore their underpinning pedagogic principles.

1.2 Materials and methods

1.2.1 Research context

This investigation was conducted in an English Premier League category-one football academy. The academy followed the Elite Player Performance Plan (EPPP) and, as per its recommendations, was structured into a foundation phase (FP) (under 6-U11); youth development phase (YDP) (under 12-U16); and professional development phase (PDP) (under 17-U23) (Premier League, 2011). As part of the academy's curriculum, team-based video-feedback sessions were scheduled on a weekly basis for all age-groups. The age-groups' lead coach and a performance analyst collated footage for the feedback sessions, which were facilitated by the lead coach with sporadic input from the assistant whilst the analyst operated the presentation of video footage.

1.2.2 Participants

Four full-time male coaches aged 46.25 years ± 7.09 years and working with players in four different age-groups (i.e., under 13, 14, 15 and 16), consented to participate. It was deemed most appropriate to recruit YDP coaches for several reasons: 1) this is the largest (i.e., number of teams) phase and, thus, offered the largest number of coaches to recruit; 2) there is a curriculum coherence and consistency, in this academy at least, across the YDP meaning the expectations at age-group are broadly similar; and 3) players are involved in 11-a-side fixtures, whereas the FP compete in small-sided games and the PDP participate in a league competition with a greater focus on winning. Thus, the YDP offered a wholly development-focussed sample of coaches. Brief pen-pictures of each of the coaches can be seen in table 1.

Table I.1. Coach profiles

Pseudonym	John	Mark	Peter	Kieran
Age	56	41	41	47
Higher coaching qualification	UEFA Pro License	UEFA A Licence	UEFA A License	UEFA A License
Others coaching qualification	AYA	AYA; PL 5	AYA	PL 5
University qualifications	N/A	N/A	N/A	N/A
No. of years coaching	20	15	8	22
No. of years coaching youth	12	15	8	22
No. of years delivering video sessions	10	8	8	18
No. of years playing professionally	19	18	18	0

*AYA and PL 5 are the FA Advanced Youth Award and Psychology Level 5, respectively.

1.2.3 Procedure

Full ethical approval from the university ethics committee (ref: 15/SPS/010) was provided. The academy manager provided gate-keeper consent for the study to take place; players' parents provided signed consent for player involvement; and both coaches and players provided signed consent prior to data collection starting.

Systematic Observations

A total of 22 sessions lasting 459.18 minutes were analysed. The shortest lasted 8 minutes 18 seconds and the longest 33 minutes 39 seconds and two sessions were excluded (i.e., not video-based or not intending to develop players' game-knowledge or decision-making). Coaches´ communication, player participation and the screen were video recorded using a tripod mounted digital video camera (Sony HVR-Z5E, Japan) positioned at the back of a sound-proofed classroom.

We followed a similar approach to Cushion et al. (2012a), adapting pre-existing observation instruments (i.e., CAIS, Cushion et al., 2012a; and ASUOI, Lacy & Darst, 1984) into a representative instrument that measured coach behaviour within video-feedback sessions. The first author became familiar with systematic observation, reviewed existing coach behaviour tools, and explored the categories included in the CAIS and ASUOI. The initial two sessions for coach habituation (Darst et al., 1989) were also pilot coded to understand behavioural profiles. Subsequently, to develop a bespoke coding framework with enhanced face validity, continuous consultation occurred between PR and a team with 48 years of

combined experience coding behaviour, sport psychology and coaching pedagogy. The final instrument was used once new categories and/or altered definitions were agreed unanimously by the panel and no new behaviours emerged during additional pilot coding (Table 2).

This process resulted in an instrument composed of fourteen primary categories with 'Questioning & Player Participation' split into convergent and divergent questioning and player participation (Table 3). As footage included past games, coaches provided feedback on players´ actions, remained silent, asked questions, or allowed players to intervene, and cued attention to certain video events. Additional amendments involved the integration of one sole management category, introduction of 'assistant intervention' and 'question to assistant', and removal of 'instruction' (see table 2 for definitions). All coding involved event frequency and duration recording.

Table I.2. Definitions of coach behaviours within video-feedback sessions (Adapted from Cushion et al., 2012a; Lacy & Darst, 1984)

Behaviour	Description
Feedback	The coach gives information on the outcome of an action or the movement pattern that caused the result by supporting, unsupporting or correcting players´ performance. e.g., *'Great turn, Scott', 'That wasn´t good enough', 'That pass broke their defensive line', 'Try to get in the half turn next time'.*
Silence	Coach is visibly engaged observing the game in the video in silent or performing other different action such as waiting for a player's response, standing, walking.
Convergent questioning	Limited number of correct answers/options – closed responses. e.g., *'What is the right thing to do in this situation, dribbling or passing?', 'How many players are pressing the ball?'*
Divergent questioning	Multiple responses/options – open to various response. e.g., *'What would you do in this situation?', 'Tell me what you think you need to get better at'.*
Player participation	A player actively verbalises or demonstrates the right or wrong decision or execution of a skill, technique, movement, positioning, etc. at any given point of the session.
Cueing convergent	Verbal cues or prompts with limited options directing players´ attention to a sequence of footage without showing support/dissatisfaction with the player/s´ performance. e.g., *'Martin's driving the ball to commit the defender', 'He is standing still between the two centre backs'.*
Cueing divergent	Verbal cues or prompts with unlimited options that direct players´ attention to a sequence of footage without showing support or dissatisfaction with the player/s´ performance. e.g., *'Look what he's doing', 'Look at his movement'.*
Praise	General positive or supportive statements not relating to a specific skill demonstrating the coach's general satisfaction with a player(s). e.g., *'Well done', 'Good effort', 'Terrific play'.*
Scold	General negative or unsupportive statements not relating to a specific skill demonstrating the coach's general displeasure with a player(s). e.g., *'If you don't behave, I'll have to send you out'.*

Hustle	Verbal statements linked to effort to activate or intensify previously directed behaviour. *e.g., 'Listen', 'Pay attention'.*
Humour	Jokes or content designed to make players laugh or smile. e.g., *'Have you got steel toe caps in those trainers?'*
Punishment	Specific punishment following a mistake or for disruptive behaviour. e.g., *"Get out".*
Management	Management that contributes to organising the content or the structure of the video-based feedback session, the information presented or to direct the technical equipment. e.g., *'I want you to get in threes', 'Today's aim is transitioning', 'The next clip is about defending the counter outnumbered', 'Hold the video there', 'Let it go'.*
Assistant intervention	Intervention of the assistant coach, performance analyst or other member of staff assisting the session by responding to the coach's question, asking the player(s) or giving any type of information to the player(s)/coach. e.g., *'We saw all the way through the game and that we need to get better at'.*
Question to assistant	Question from the lead coach to the assistant coach, performance analyst or other member of staff that are related to any performance issues. e.g., *'Would that be a fair comment, Tom' (pseudonym)?*
Uncodable	Any other behaviour not fitting any of the previous categories.

Inter- and intra-observer reliability were calculated using the formula (agreements) / (agreements + disagreements) x100 for both event frequency and duration (seconds) data. Objectivity between both observers´ understanding of behaviour definitions was calculated using inter-observer reliability testing. This was performed by PR and a trained observer who coded the same session separately and scores demonstrated 88% and 86% agreement levels for frequency and duration data, respectively. To calculate intra-observer reliability and reduce observer drift, PR initially coded the same session on two separate occasions a week apart, followed by re-coding of the same session on four separate occasions after coding eight different sessions (Darst et al., 1989). Comparisons between the four sessions ranged from 94-97% and 93-98% for frequency and duration data, respectively. Both types of agreements exceeded the threshold for acceptance of 85 % (van der Mars, 1989).

Interviews

One-to-one semi-structured interviews were conducted with each coach after all video data had been collected. Interviews lasted between 36 minutes 52 seconds and 52 minutes 40 seconds (average 44 minutes 46 seconds) and explored coaches' understanding of their pedagogical behaviours during the sessions. The lead researcher conducted two pilot interviews with qualified coaches who were aware of the project but not directly involved. These pilot interviews were supervised by experienced qualitative researchers (second and third authors)

and provided feedback on question delivery, timing and probing, explored the order and organisation of questions, and considered additional follow-up questions.

Each interview was digitally recorded (Olympus, VN-741PC). The interview schedule was developed deductively based on the behavioural categories utilised. A flexible approach to interviews was necessary to explore issues in greater detail (Bryman, 2015). The schedule was divided into three phases: (1) biographical and profile questions; (2) considerations of video-feedback within the coaching process; (3) video-stimulated recall of cognitions underlying behaviours. The adoption of stimulated recall was deemed necessary due to time-lapses between the first and last video-feedback sessions and associated memory degradation. Specific stimulated recall questions were posed as open questions once a passage video had finished playing to allow coaches reliving their retrospective cognitions. Coaches were free to stop the recording at any point during the video to verbalise their emerging thoughts (Lyle, 2003; Meier & Vogt, 2015). Interviews concluded with the lead researcher offering an opportunity for clarification on, or any questions about, the project to be asked by the coach.

Field Notes

Whilst undertaking data collection, PR also maintained field notes following systematic observation data collection sessions. A total of 22 A4 pages of handwritten notes were generated. In addition, a professional development notebook was also kept that recorded interactions with all staff at the academy, including the coaches involved in this study, and interactions with these coaches were extracted from the notebook; a total of 12 A5 pages of handwritten notes. These notes included interactions and discussions at various, non-formal situations, such as over lunch, or coffee; and discussions varied in focus. From technical aspects of coaching to components directly related to this study (i.e., coach behaviour during video feedback sessions). Furthermore, PR also engaged in a reflective and reflexive dialogue (Attia & Edge, 2017) with the other authors, collectively, at frequent intervals, but also individually on an ad-hoc basis. These data were not analysed, but used as *aide-mémoirs* to help contextualise, explore, and understand in more depth the data collected and ensure high levels of analytical rigour and trustworthiness were attained.

1.2.4 Data Analysis

Systematic observation data

Twenty-two team-based video-feedback sessions were included for analysis. Two sessions were excluded as they were not video-based and/or did not intend to develop game-

knowledge. Data were exported from Sportscode© Gamebreaker (version 10) into Microsoft Excel (2010). Before any calculations, all behaviour durations were converted into seconds and behaviour duration for successive sessions were levelled in consecutive columns. Average duration for each behaviour was determined by dividing the sum duration of each independent behaviour category within every session by the total number of sessions delivered. Average duration of each independent behaviour was divided by the total behaviours' duration and then multiplied by 100 to obtain the mean percentage time for every behaviour.

Interview Data

Interviews were transcribed verbatim to ensure an accurate record of data which yielded 51 pages of single line spaced text. Transcripts of each participants' interview was given to them to check for accuracy of the transcription and comment on any areas they felt were unclear, to preserve ethics and empower the participants to feel in control of what was written (Mero-Jaffe, 2011). After one week all participants were asked for any points of clarification they wished to make; none of the participants offered any corrections, extensions, or clarifications of their transcripts.

To ensure familiarity, transcripts were read and re-read by PR several times throughout the analysis phase. Analysis followed Braun et al. (2016) six-stage procedure with transcripts read in detail to understand data in relation to the primary question. During the first full read through, no notes were made nor was there any attempt to analyse the data; rather PR absorbed the text and considered it in its entirety. From the second full reading, notes and meaning were applied to the transcripts. Subsequent readings included the development of themes by clustering raw data into possible 'higher level' themes; an initial codebook was developed, drawing on the interview protocol, and was continually refined as the coding process occurred. Once the higher and first order themes were decided, the 'fit' between coded data, their higher order theme and the meaning within the whole data set were reviewed.

Rigour and standards of 'trustworthiness' during data analysis were maintained following the 'transparency and coherence' core principles of Yardley (2000, 2008) by clearly "articulating and presenting findings while being mindful of the grounding within the participants' lived experiences" (Tawse et al., 2012, p. 211). The research team had several debrief meetings to develop the interview schedule content and organisation and the second pilot interview was pilot tested to check for appropriateness, question order and probing.

Further, the incorporation of coded data into certain higher order themes was discussed between team members until agreement on its suitability and the final structure was achieved.

1.3 Results / findings and discussion

During video-feedback, the most employed behaviour was 'feedback'. John, Mark, and Peter presented a similar behaviour pattern with 'feedback', ensued by 'silence', 'player participation', convergent and divergent questioning. When subtracting 'feedback' from 'questioning & player participation', the difference exceeded 20%. Kieran´s most utilised behaviour was 'feedback', however it was followed by 'player participation', 'silence', convergent and divergent questioning. When subtracting his 'feedback' from 'questioning & player participation', it equalled to 8.31 % due to his higher values of questioning and player participation (Table 3).

Table I.3. Mean percentage time of coaching behaviours within video-feedback sessions

Behaviour	John	Mark	Peter	Kieran
Feedback*	**38.34 %** ± 11.89	**37.81 %** ± 10.17	**52.91 %** ± 3.23	**41.60 %** ± 8.57
Silence*	**36.80 %** ± 17.27	**34.07 %** ± 11.74	**18.46 %** ± 4.29	**10.85 %** ± 7.56
Questioning & Player Participation*	**12.22 %** ± 11.46	**14.38 %** ± 9.70	**23.59 %** ± 3.81	**33.29 %** ± 4.20
Player participation	7.93 % ± 7.15	10.01 % ± 7.84	12.53 % ± 2.97	20.17 % ± 6.62
Convergent questioning	2.17 % ± 2.29	2.47 % ± 1.37	6.75 % ± 2.92	7.10 % ± 2.34
Divergent questioning	2.12 % ± 2.68	1.90 % ± 0.96	4.31 % ± 1.39	6.02 % ± 0.95
Cueing convergent	**0.76 %** ± 1.22	**1.08 %** ± 0.85	**1.29 %** ± 0.39	**1.43 %** ± 1.04
Cueing divergent	**0.26 %** ± 0.56	**0.41 %** ± 0.54	**0.62 %** ± 0.11	**0.84 %** ± 0.75
Praise	**0.15 %** ± 0.37	**0.06 %** ± 0.13	**0.00 %** ± 0.00	**0.03 %** ± 0.06
Scold	**0.00 %** ± 0.00	**0.01 %** ± 0.02	**0.00 %** ± 0.00	**0.25 %** ± 0.32
Hustle	**0.11 %** ± 0.28	**0.02 %** ± 0.07	**0.00 %** ± 0.00	**0.13 %** ± 0.20
Humour	**1.23 %** ± 1.11	**1.39 %** ± 0.82	**1.48 %** ± 0.77	**0.69 %** ± 0.62
Punishment	**0.00 %** ± 0.00	**0.00 %** ± 0.00	**0.00 %** ± 0.00	**0.00 %** ± 0.00
Management	**3.08 %** ± 1.11	**4.89 %** ± 2.93	**1.43 %** ± 0.10	**7.05 %** ± 3.90
Assistant intervention	**2.97 %** ± 7.28	**0.84 %** ± 0.99	**0.00 %** ± 0.00	**0.87 %** ± 1.88
Question to assistant	**0.03 %** ± 0.06	**0.04 %** ± 0.07	**0.00 %** ± 0.00	**0.07 %** ± 0.16
Uncodable	**4.05 %** ± 6.14	**5.00 %** ± 9.11	**0.22 %** ± 0.37	**2.90 %** ± 2.05
Total behaviour	**100 %**	**100 %**	**100 %**	**100 %**

The unstructured qualitative data from the interviews was organised utilising thematic analysis. This included the identification of quotes clustered into first and higher order themes.

The final structure of higher and first order themes is presented in figure 1 and its raw data examples have been inserted into the discussion to support its arguments.

This study examined junior-elite coaches' behaviour and their underlying cognitions during video-feedback sessions. Therefore, coaches´ values of feedback and questioning & player participation, the three identified forms of cognitive dissonance or epistemological gap and their implications for player learning will be discussed.

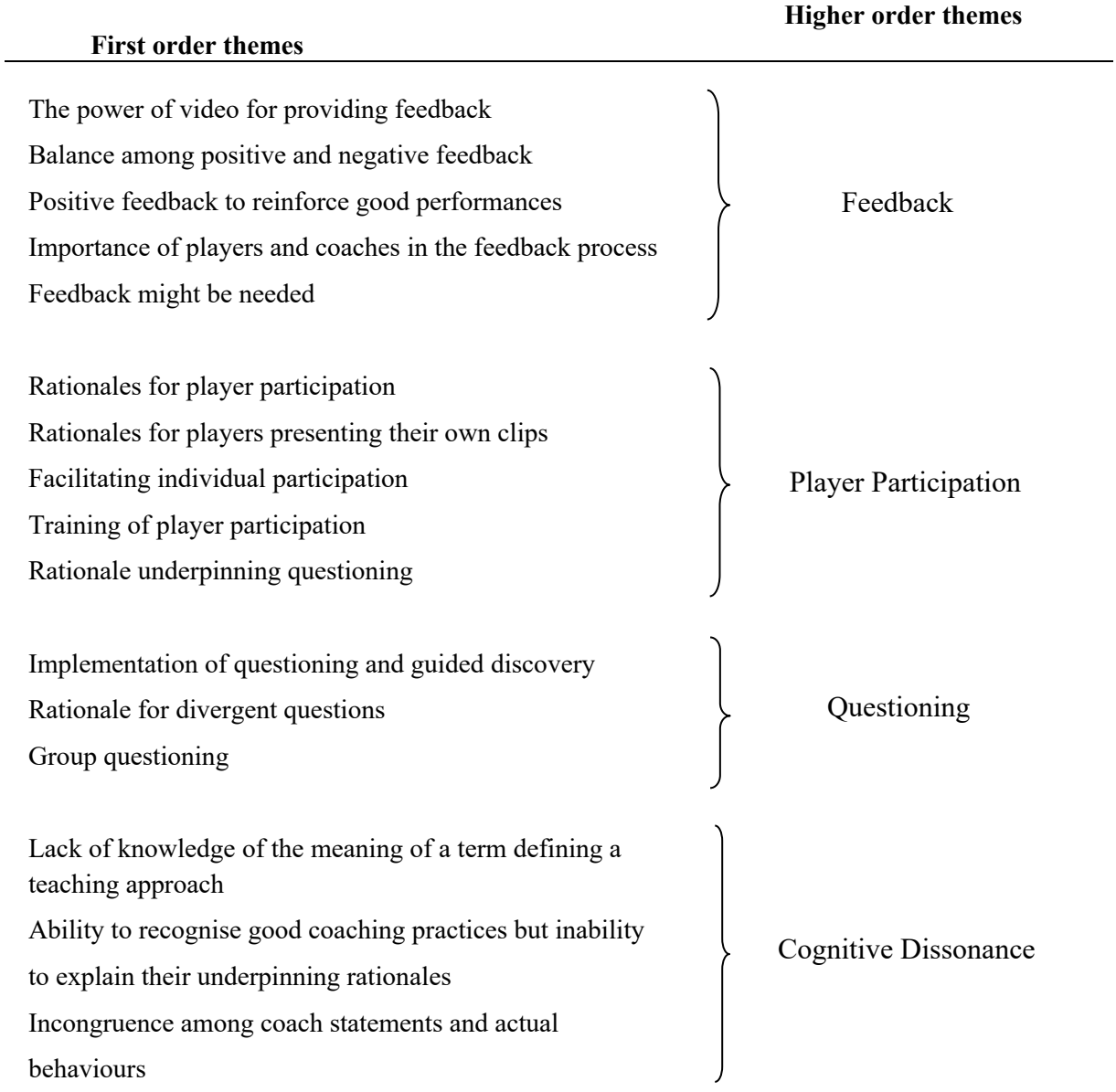

Figure I.1. Final organisation of qualitative data in higher and first order themes

1.3.1 Feedback

A prescriptive coaching approach was observed with feedback being the most employed behaviour for all coaches. Previous research within training and games reported

instruction as the most employed behaviour (Ford et al., 2010; Partington & Cushion 2012). However, within video-feedback, as footage was of past games and coaches could not provide instruction to direct a previous performance action, coaches spent most time providing feedback.

Technological developments have facilitated introducing performance analysis systems within the coaching process (Stratton et al., 2004). Video is acknowledged as a useful tool that provides a visual representation of the performance environment to the athlete (Crook et al., 2012). Indeed, Mark explained video´s power in transmitting messages by itself:

> *"You can tell a player something as much as you like but until some players actually see it, it doesn´t hit on the penny, it doesn´t drop. Whereas if you can show them it. It might be them doing it, it might be a teammate, it might be a best player, eh … but it´s a real strong message when they see it into the screen…"*

This concurs with Groom and Cushion (2004, 2005) who state that aside from developing players´ understanding and decision-making, video is beneficial to provide feedback. Careful consideration is needed when selecting video clip sequences and provide augmented information as this can influence player motivation and confidence (Hoigard et al., 2006). Moreover, positive outcomes are more likely when players receive encouragement after mistakes (Smoll & Smith 2010). Peter highlighted the selection of clips reinforcing players´ behaviours as a strategy to encourage certain actions:

> *"…I try to pull out the things that the boys do positive so… For instance, if a centre forward, … he´s making good runs but he´s not getting the ball, I´ll show him making them runs for them to keep making them runs and encouraging that what he´s doing is good…"*

Although player self-esteem can be enhanced through positive verbalisations (Smith et al., 1978), not all the information must support player performance. Kieran suggested a positive balance with some negative clips communicated constructively to facilitate player improvement:

> *"So the balance would be lots of good clips but a few at the end not so good. Because if we don´t show them clips that aren´t so good, are we gonna get any better? And it´s not about being negative, it´s about showing them what you could have done better. That wasn´t so good. How could we´ve done better in that situation?"*

Research proposes a ratio (1:1) with negative sequences followed by positive examples and negative clips reduced when a team or individuals lack confidence due to recent poor

performances (Groom & Cushion 2004; Reeves & Roberts 2013). Krueger (2002) and Goudas et al. (2000) asserted that positive feedback reinforces positive behaviours and increases perceptions of task competency, whereas negative feedback can challenge improvement and students´ knowledge to a greater extent. Therefore, combinations of positive and negative video clips could be effective to encourage players´ desirable behaviours while challenging them to generate better solutions to specific game-situations.

1.3.2 Questioning & Player Participation

Data highlighted low values of questioning & player participation. Excluding Kieran, players actively participated for less than a fifth of the total session. All coaches´ convergent questioning values were higher than divergent questioning. There is consensus among coaches, players, and performance analysts that video-feedback increases player game-understanding and tactical knowledge (Groom et al., 2011; Francis & Jones, 2014). Furthermore, when combined with questioning, is shown to develop more sophisticated problem representation and improved player decision-making during competition (García-González et al., 2013).

Learning theories advocate more 'hands-off' approaches to teaching and a major involvement of learners in the process (Davis & Sumara, 2003). The Social and Cognitive Constructivist models declare that learning can be facilitated through engagement in social interactions or intra-personal cognitive activity (Light, 2008). This position was supported by coaches´ understanding:

> *"I think the player should be involved isn´t it? I think it´s about the coach showing them up in the video the clips and then looking for a player-coaching relationship on what we could´ve done better, what did we do well, … So just player to coach and player to player feedback really…"* (Kieran)

> *"… by asking them questions as well, making them relax, so that they…in the environment…feel comfortable if I ask them to step up and show how they read the situation".* (John)

Mark encouraged intra-personal knowledge construction through an initiative requiring players to select clips of themselves or best players, which directly linked to their individual learning objectives (ILOs). Players shared these clips and received questions from teammates and coaches. Similar approaches in formal education (Aiken et al., 1975; Lin & Bigenho, 2011) highlight the potential benefits for memory recall when collecting and presenting information. Mark explained the benefits of this strategy as:

"…some might wanna be lazy and just sit and watch and switch off…But then, you´re almost forcing them to go away and watch best practice themselves whereas in the past it´d be … oh well the coach will do that … Whereas when they have to go and search for their best practice and present it, it´s stimulating the learning process…"

Cognitive Constructivism theory reinforces the role of thinking in facilitating understanding (Light, 2008). Lorin et al. (2001) refined a taxonomy encapsulating ascending levels of cognition (i.e., remembering, understanding, applying, analysing, evaluating, and creating). The higher order thinking skills allow learners to construct meaning and knowledge that can be effectively used in new situations (Resnick, 1987; Brandsford et al., 2000). Thus, instructional behaviours promoting various levels of cognitive engagement have been tested to understand how they mediate skill development. For instance, guided discovery that directs learners to key aspects of skill (using fewer instructional cues) was more effective for skill acquisition than discovery learning or explicit instruction (Smeeton et al., 2005). However, coaches´ interpretations of 'what' guided discovery is and 'how' to implement it during video-feedback was explained as a succession of questions leading players toward responses:

"Well, I think you try to get the answers from the players. Don´t tell them the answers. Trying guide them towards the answers and then try to get the answers out of them". (Mark)

"So, I give them a question but leave it opened, they give me the answer and then we look for a bit further on them. Come on then, give us a bit more, what you mean. Well, we could have … It´s trying to get them to really open their minds to give feedback…" (Kieran)

Questioning is an alternative instructional strategy that promotes players´ self-analysis (Vickers, 2007). It encourages learners to find answers or develop problem-solving skills that allow them to explain their thinking or elaborate new reasoning (Cazden, 2001; Sahin, 2007; Chin, 2007). Schön (1983) outlined that, questions and discussions allow players to bring knowledge to the level of consciousness and internalise it. Coaches´ beliefs appeared consistent with this interpretation:

"I want it to come from the players because I think that´s powerful. so that player who came with the answer, that will stick with him and possibly with the other player because a player is come up with it … I think research show isn´t it. When a player comes up with an answer himself then sticks …" (Mark)

Furthermore, question types pose varying cognitive demands (Johnson, 1997). Convergent questions have limited response options and typically require lower order thinking skills such as information recall; whereas divergent have unlimited response options and, when well-articulated, can stimulate higher levels of thinking and require the generation of responses (Harvey & Light, 2015). As in this study, previous analysis of teachers´ questioning in classroom settings have reported higher use of convergent questions (Daines, 1986; Sellappah et al., 1998). Surprisingly, Kieran expressed his preference for open questions:

> *"I think it should be an open dialogue. You know what did we do well on Sunday? That´s not a question. Well it´s a question but it´s an open one… Someone might come up with well we controlled the game … On feedback sessions, it should be more than opened questions, more than direct questions. I think that´s how it should be. That´s the way I like it to be anyway"*

1.3.3 Cognitive dissonance or epistemological gap

Three forms of cognitive dissonance or epistemological gap were detected: (1) lack of knowledge about meaning of terms related to teaching approaches, (2) ability to recognise good coaching practices but inability to explain the underpinning rationale and (3) incongruence among coaches´ statements and behaviours. According to Davis and Sumara (2003), the lack of understanding of teaching-related terms occurs due to the acquisition of vocabulary without understanding its critical meaning. This is observed in John´s interview when viewing a clip where he provided prescriptive information, followed by his justifications:

> *"That´s guided discovery. It´s showing Martin (pseudonym) where he was as we were attacking and where should be when we were attacking … So one of Martin´s ILOs would be getting into the final post because Martin has a tendency to switch off. So, when the ball gets crossed Martin still too far away outside the box…"*

Although John´s recall seems accurate, it became evident that his understanding of 'guided discovery' was incorrectly framed. The incorrect use of this term demonstrated lack of understanding and, perhaps, awareness of guided discovery a potentially desirable coaching approach in a development environment. Interestingly, John had completed the FA Advanced Youth Award, where module three focuses on alternative instructional methods (The FA, 2014). However, he seemed to be using 'guided discovery' without appropriate understanding of meaning and how to implement this effectively within a video-feedback environment.

Further cognitive dissonance was observed between coaches´ ability to utilise teaching approaches more beneficial for learning without understanding why. For example, Peter highlighted his support for players selecting and presenting video sequences linked to their

individual learning objective´s during video-feedback, though was unable to rationalise why he selected this approach. Similarly, Kieran stated his preference for a video-feedback environment where players discussed positive aspects and areas of improvement. Nevertheless, when asked about the effects of player involvement and interaction on learning, Kieran was unable to respond:

> *"I think the benefits from it are that the boys will learn it quicker, the boys will understand what they need to do, and also they´ll be making better decisions, better decision making´s".* (Peter)

> *"Just to give them a greater knowledge, greater understanding, greater learning of what we are trying to do or what we are trying to develop them as footballers whether that´s a positive clip or not…"* (Kieran)

Festinger´s (1957) work connoted cognitive dissonance as discomfort when an individual is aware of the tension between two dissonant cognitions. The 'New Look' theory emphasised that cognitive dissonance was more likely to occur when actions contradict the self-concept (Cooper and Fazio 1984). Data suggest a disconnect between coach awareness of desirable behaviours and the underpinning reasons for its use. This disconnect did not appear to provoke discomfort or willingness to change. Perhaps this is due to these approaches not causing observable adverse consequences (Festinger & Carlsmith, 1959), albeit players´ thoughts could have experienced detrimental effects.

The third form of cognitive dissonance, similar to Harvey et al. (2013) and Partington and Cushion (2013) within practice environments, was coaches´ lack of self-awareness. Both Mark and Kieran exhibited strong philosophies and understanding of certain issues (Mark - guided discovery and player participation; and Kieran - divergent questioning). However, their actual behaviours were not aligned with such positionings and comparison between actual and desired behaviour could lead to behaviour and/or belief adjustment. With this purpose, coaches´ reflections on their video-feedback sessions´ delivery could be facilitated through video and/or a critical friend (Partington et al., 2015).

1.4 Limitations

Firstly, systematic observation measured quantity of behaviour without ascertaining its quality. For example, percentages of convergent questions could reflect a deliberate strategy to reduce the challenge posed by an initial divergent question and this would not necessarily

indicate a poor use of questioning. Second, the generalisability of the systematic observation results is constrained due to including data of four lead coaches working at the YDP at a single category one academy in England. Finally, the presence of a camera within the sessions could have promoted coaches´ self or shared reflexivity leading to representations of certain modes of coaching considered more appropriate than others (Cushion, 2016).

1.5 Conclusion

Coach feedback was the most frequent behaviour for all coaches and only one coach (i.e., Kieran) enabled player participating for a fifth of the session. While augmented feedback, does not necessarily involve players´ in the problem-solving process (Williams & Hodges, 2005), players´ answering a question or intervening on own initiative seem to require engagement in lower or higher cognitive activity and therefore, should be increased when possible. In this study, coaches with higher questioning *(*i.e., Peter and Kieran) increased player participation. Further, it is argued that divergent questions requiring more complex reasonings and responses could enrich the quantity and quality of cognitive activity compared to convergent questions.

Although teaching methods need to be underpinned by learning implications (Light, 2008), the coaches presented three forms of cognitive dissonance or epistemological gap. Firstly, the use of teaching-related terms underpinned by flawed understanding. Second, ability to identify beneficial coaching practices but inability to rationalise why. Third, coaches presented strong rationales to use certain behaviours, however, exhibited contradictive behaviour scores.

This study constitutes an exploratory first attempt to capture coaches´ behaviours and underpinning knowledge for approaching team-based video-feedback sessions. It reports junior-elite coaches´ behavioural profiles and their underlying pedagogic knowledge that rationalises their use of certain behaviours within a classroom-based environment. Additionally, it identified three different forms of the cognitive dissonance phenomenon during video-feedback sessions.

To conclude, coaches demonstrated similarity and difference between their behaviours and underpinning thinking and knowledge. This indicates a need to consider baseline behaviours and knowledge to coach within a classroom environment before attempting to change behaviour and/or increase understanding. Therefore, systematic observation, interviews and stimulated recall can help identify coaches´ group and individual learning needs.

STUDY II:

- Specific aim 2: To critically examine youth coaches' behaviours and underlying perceptions regarding their half-time talks.

Original research article

International Journal of Sports Science & Coaching

International Journal of Sports Science & Coaching
1–13

DOI: 10.1177/17479541221141049
journals.sagepub.com/home/spo
SAGE

The half-time talk: A mixed-method examination of youth-elite football coaches' behaviours and team-management strategies

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Abstract

Football, unlike some other team sports, includes limited game interruptions for coaches to easily communicate with players and affect their performance. However, a reduced number of studies have explored how coaches attempt to influence players during half-time. This study examined football coaches' behaviours during half-time and their perceptions underpinning their talks' delivery. Five Spanish coaches (M_{age} = 32.2, SD = 8.8) working for a *La Liga* academy were systematically observed during half-time talks (n = 20) and participated in a semi-structured interview each. Half-time talks were coded using a modified version of the Coach Analysis and Intervention System, and semi-structured interviews were analysed following thematic analysis procedures. Instruction and feedback were the most employed behaviours for four coaches, with younger age-group coaches employing greater divergent questioning and in-talk player participation. Furthermore, data suggested that coaches conferred with their staff, before entering the changing room and rapidly progressed from divergent to convergent questions and feedback and instruction. The team's 'level of play' was the most perceived relevant factor affecting the verbal and vocal strategies of coaches' messages, albeit the score gained importance for coaches of older age-groups. This study is pioneering, examining how coaches attempt to influence their players during half-time talks of competitive youth football.

Keywords

Coach behaviour, player talk, half time, team management, soccer

2.1 Background

The multiple stimuli existing within team-sport games do not provide coaches with enough time to communicate with players and affect their in-game performance (Mouchet et al., 2014). Indeed, game-breaks inside competition (i.e., time-out, half-time, and end of quarter) appear more appropriate situations to intervene (Mason et al., 2020). For example, Lorenzo et al. (2013) identified that basketball coaches use more elaborate instructions and questions during these periods than during the game. However, although the half-time interval in football is the only occasion enabling a prolonged interaction with players throughout the game (Zach et al., 2022), previous studies have examined the type of messages provided during combined game-break types (Madden, 1995; Allain et al., 2018). Only a few have specifically addressed the perceived factors underpinning coaches' half-time delivery qualitatively (Avugos et al., 2018; Mouchet & Maso, 2018), and no attempts have systematically observed the full spectrum of behaviours employed by elite youth football coaches during half-time. Therefore, integrating systematic observations and qualitative interviews can provide depth regarding the cognitive processes that guide coach behaviour (Partington & Cushion, 2013) during half-time talks.

Contextual situations surrounding games (e.g., opposition quality and game type) are perceived as relevant factors for adjusting team-talks' content. For example, Vargas and Guan (2007) identified nine different contextual pre-match scenarios and stated 'before beginning play in an important tournament' or 'when competing against a higher-ranked opponent' as coaches preferred situations for delivering more informational or emotional talks, respectively. Moreover, the game score has been highlighted as a potential influencing factor of coaches and their communication approach. In fact, the score appears to modulate coaches' amount and type of messages provided during game-breaks. Coaches have been observed employing a more positive approach during winning game-breaks (Madden, 1995; Halperin et al., 2016), and increasing and decreasing psychological units and tactical-content time during losing half-times (Zach et al., 2022). In addition, coaches' non-verbal expressions can be an indicator of the current score during games. Indeed, participants with varied football experience have accurately recognised far and close wins/loses based on coaches' non-verbal expressions during selected sequences of real elite games (Thrien & Furley, 2021). Hence, it is suggested that the match status at game-breaks can affect coaches' emotions and their communication approach, thus, having an impact on players.

Emotion as social information (EASI) theory suggests that an individual's non-verbal expressions can influence observers' emotions, cognitions, and behaviours (Van Kleef, 2009; Van Kleef, 2016). For instance, coaches combining standardised verbal feedback and non-

verbal expressions have been shown to influence junior football players' emotions and performance positively or negatively after completing soccer-specific tasks (Moll & Davies, 2021). During half-time talks, Van Kleef et al. (2019) obtained contradictory findings regarding coach-player emotional contagion. Whilst coaches' non-verbal anger expressions were associated with players' anger during half-time, a similar effect for happiness was only found during pre-match. It was argued that the numerous dynamics occurring throughout a game could hinder the effects of coaches' happiness on players experiencing the same emotion at half-time. Nevertheless, both coaches' happiness and anger expressions led players to perceive better and worse team performance, respectively. Thus, despite the insufficient evidence to claim a direct coach-player emotional contagion in the previous study, coaches' emotional expressions appear to condition players' inferences of first half performance.

Whilst the impact of half-time talks on players has recently been examined in basketball (Zach et al., 2022), understanding of coaches' complete verbal activity during this period and with players of various development stages is still scarce. In fact, previous literature has claimed that leaders (i.e., coaches) are typically defined by the outcomes achieved on their followers (i.e., players) rather than their actual behaviours (Arthur et al., 2017). Only Avugos et al. (2018) and Madden (1995) have referred to this coaching situation as a monologue where coaches mainly use solution messages (i.e., instructions) and comments about performance (i.e., feedback) predominantly involving criticism. However, these descriptions are vague and do not contribute to capture an accurate picture of what half-time coaching involves or its underlying cognitive processes.

These aspects are relevant to understand the context-specific intricacies of coaches' working realities and encourage discussion and reflection upon practice. Therefore, this study aimed to explore the behaviours of elite youth football coaches and underpinning perceptions regarding their half-time talks. Specifically, it was sought to understand: 1) the behavioural profiles of coaches of different age-groups and their players' levels of involvement; and 2) coaches' cognitive processes determining their half-time talks' structure, contents, delivery approach, and factors affecting their team-management strategies.

2.2 Materials and methods

2.2.1 Setting and context

This study was conducted at a Spanish *La Liga Santander* football club academy. The academy was structured into a 7-a-side phase (under 9-12 age-groups); an 11-a-side development phase (under 13-15's); and a 11-a-side performance phase (under 16's, 18's, and

19's), with all age-groups playing competitive home or away fixtures on a weekly basis. All games involved a first and second half, interspersed by a regulation half-time break, during which, players and staff returned to their allocated dressing room.

2.2.2 Sampling and participants

Sampling was restricted to participants from a single club, determined by the study design and facilitated by the club's accessibility. Lead coaches were invited to participate if they had responsibility for leading half-time team talks and technical and support staff were excluded *a priori*. Thus, based on the academy size, a maximum of 10 coaches (one per age group) were eligible for participation in the study.

A two-week cooling off period was employed for coaches familiarising with the study's procedures and deciding their desire to participate. After this process, five male head coaches, with representation within the 7-a-side, 11-a-side development, and 11-a-side performance phases, agreed to participate. They had a mean age of 32.2 years (24-47, *SD* = 8.8) and mean coaching experience of 14.6 years (7-27, *SD* = 8.1). Participant numbers between three and five have been deemed acceptable for enabling diversity and examining patterns and contrasts in coach behaviour and underpinning rationales (Berg, 2007). In addition, it was intended to generate authentic and transferable context-dependent knowledge (Grünbaum, 2007) rather than normative behaviour profiles. Therefore, considering the lower frequency of half-time breaks compared to training sessions and following previous mixed-method case studies (e.g., Stonebridge & Cushion, 2018), each participants' half-time talks were captured on four occasions. Brief pen pictures of each participant can be seen in Table 1.

Table II.1. Participants' profiles

	Participants Pseudonyms				
Characteristics	**Jacinto**	**Amador**	**Rogelio**	**Damián**	**Rafael**
Age	24	47	28	31	34
Age-group coached	U10	U13	U14	U15	U18
Coaching qualification	UEFA A	UEFA Pro	UEFA A	UEFA Pro	UEFA Pro
University qualification	BSc	BSc	N/A	MSc	N/A
No. of years coaching	7	27	14	8	17
No. of years coaching youth	7	19	14	8	17
No. of years leading half-time talks	5	27	14	7	15
No. of years playing professionally	0	0	0	0	0

2.2.3 Procedure

This was a cross-sectional case study design, with data collected using systematic observations and qualitative interviews. The study was approved by an institutional ethics committee (ref: 781/CEIH/2019). The first author (PR) approached the academy regarding their potential involvement in the study. The academy manager agreed to facilitate the study and allowed the research team to contact coaches regarding their involvement.

Potential participants (i.e., coaches) were provided with the study information sheet and had the opportunity to ask any questions that they had about the study. Informed assent was obtained from those indirectly involved in observational data collection (i.e., players and staff) and all participants provided written informed consent for this project to take place. Coaches who consented to participate informed the research team about their upcoming home fixtures, including dates and kick-off times. It was decided to only include home-based half-time talks to avoid the potential contextual influence of match location on coaches' behavioural activity. Opposition quality (i.e., games vs higher/lower-ranked teams) was not controlled due to this data being collected at the start of the first leg of league competitions when not all teams have played against each other and, therefore, not being a fully reliable indicator of 'team quality'.

Systematic observations

Half-time talks of home fixtures were filmed over a nine-week in-season period (27th September to 1st December 2019). A digital video camera (Sony HDR-CX900E, China) was mounted on a tripod and positioned in the changing rooms so it could capture all players and the coach. To capture all half-time interactions within the room, recording was set before anyone entered the changing room and stopped when all staff and players had left for the second half. A habituation process was followed, whereby an initial half-time talk for each coach would be recorded but not included in analyses (Darst et al., 1989).

The Coach Analysis and Intervention System (CAIS) (Cushion et al., 2012a), which has been validated for examining coach behaviour within non-performance states during the match competition (i.e., timeout, half-time, end of quarter), was employed. However, during initial coding, high volumes of 'uncodable' were obtained because a mixture of primary (i.e., 'what') and secondary (i.e., 'where' and 'who') behaviours occurred frequently but were not contemplated by the original tool. These included coach feedback about players' answers (i.e., positive and negative reinforcement) and players' game-related verbalisations (i.e., pre-talk player participation and in-talk player participation: response or self-initiated).

Thus, we followed procedures adopted by Raya-Castellano et al. (2020) to adapt the CAIS instrument including necessary additional behaviours. To ensure enhanced validity, the habituation sessions were pilot coded to ensure agreement of new categories' codes and associated definitions before these were operationalised. Additional amendments involved combination of the CAIS' primary categories into the major categories of positive and negative feedback, modelling, and management (see Table 2). Following habituation procedures, four half-time talks per coach including various match outcomes (see table 3) and totalling 183.72 minutes, were analysed.

Table II.2. Primary behaviour categories at half-time (Adapted from Cushion et al., 2012a)

Behaviour	Description and examples
Instruction	Verbal cues, reminders or prompts provided by the coach that instruct the oppositions' actions AND/OR direct the own players to skills or plays related to the second half performance or counteracting the oppositions' strategy. e.g., *'Be patient in possession. That doesn´t mean we move it slowly. Move it with tempo but be patient'; 'Force the long ball. Don´t let them play short'.*
Positive feedback	Positive or supportive statements OR non-verbal gestures provided by the coach (either general OR *specifically aiming to provide information about the quality of performance*). e.g., *'That´s brilliant, that´s exactly what I wanted'; 'I really liked how you shaped your body before turning'; 'I'm proud of the first half'; 'Great no-touch turn on the right side, Scott'.*
Negative feedback	Negative or unsupportive statements OR non-verbal gestures provided by the coach (either general OR *specifically aiming to provide information about the quality of performance*). e.g., *'That wasn´t good enough'; 'You aren´t getting in the half turn'; 'I'm disappointed with your attitude during the first half'.*
Corrective feedback	Corrective verbal statements provided by the coach that contain information *that specifically aim to improve the player(s) first half performance at the next skill attempt*. e.g., *'Try to get wider next time in that situation'; 'You probably don´t want to be levelled with the wide player'; 'When their right centre back gets it, make sure you force their play into the right-side next time'.*
Modelling	Skill demonstration- with or without verbal instruction/feedback that shows performer the correct OR incorrect way to perform.
Physical assistance	Physically moving the performer's body to the proper position or through the correct range of movement.
Positive & negative reinforcement	General statements agreeing or disagreeing with the intervention or response/s provided by one or more players. e.g., *Positive: 'Exactly'; 'Liked that'. Negative: 'No'; 'I don´t agree with that'; 'Not sure about that'.*
Praise	Positive or supportive verbal statements or non-verbal gestures which demonstrates the coach's general satisfaction or pleasure to a player(s) that *DO NOT specifically aim to improve the player(s) performance at the next skill attempt.* e.g., *'your work rate has been excellent before'; 'good effort'; 'Don´t worry about it'.*
Scold	Negative or unsupportive verbal statements or non-verbal gestures demonstrating displeasure at a player(s) performance that *DO NOT specifically aim to improve the player(s) performance at the next skill attempt.* e.g., *shaking of the head; swearing at a player(s).*
Humour	Jokes or content designed to make players laugh or smile. e.g., *'Have you eaten a steak for lunch?'; 'Brilliant pass that one' (irony).*
Hustle	Verbal statements or gestures *linked to effort* to activate or intensify previously directed behaviour. e.g., *'You can do it'; 'Keep working hard'; 'I wanna see intensity and concentration from the start'.*
Punishment	Specific punishment following a mistake or for disruptive behaviour. e.g., *"Get out"; "Given your lack of attitude you're being substituted".*

Convergent questioning	Coach asks player(s) about skill, strategy, procedure, physical condition, welfare, etc. and the question includes limited number of correct answers/options – closed responses. e.g., *'What is the right thing to do in this situation dribbling or passing?'; 'Who's the free man?'.*
Divergent questioning	Coach asks player(s) about skill, strategy, procedure, physical condition, welfare, etc. and the question includes multiple responses/options – open to various responses. e.g., *'What would you do in this situation?'; 'Tell me what you think you need to do better in the second half'.*
In-talk player participation: response	A player answers a question from the coach by verbalising and/or demonstrating the right or wrong decision or execution of a skill, technique, movement, positioning, etc. at any given point of the half-time talk.
In-talk player participation self-initiated	A player/group of players intervene(s) by asking a question or making a comment, different to the theme being currently talked. e.g., *'What's the best way to defend their striker?'; 'The wide free kick worked out really well'.*
Pre-talk player participation	A player/group of players praise/scold(s) a teammate, describe(s) a game situation that occurred in the first half AND/OR tell(s) how to solve the situation effectively before the coach starts the team talk. e.g., *'Keep doing it Adam'; 'I think you should press his right foot'; 'When the ball gets wide, I need your support. I am always defending a 2 vs 1'.*
Silence on-task	Coach is in silent and monitors the half-time talk without reacting verbally or non-verbally. e.g., pauses while presenting arguments, prolonged silences to emphasise points, etc.
Silence off-task	Coach is in silent within the changing room, not visibly engaged in the team talk. e.g., preparing the tactical board, talking individually to one player or member of staff, making notes, or performing any other action such as standing, walking, eating, etc.
Management	Management that contributes to organising turns allocations, the talks' structure, content, or information presented; the equipment, the location where player sit; or demonstrates displeasure at a player(s) behaviour during the talk. e.g., *'Today is about dealing with their transitions'; 'Let's see Paul's thoughts'; 'Has anyone seen the boards' pencil?'; 'Stop talking while I'm talking, Keenan'.*
Confer with assistants	Coach confers with assistants to talk about, manage or reflect on anything concerned with the game which happens inside the changing room.
Uncodable	Any other behaviour not fitting any of the previous categories.

*Feedback and instruction categories were coded when supported or not by visual tactical board aids.

Table II.3. First half outcomes for each coach/age group

First half outcomes	Jacinto U10	Amador U13	Rogelio U14	Damián U15	Rafael U18
Large win	0	0	0	1	2
Close win	4	2	1	1	1
Total wins	**4**	**2**	**1**	**2**	**3**
Total draws	**0**	**2**	**1**	**2**	**0**
Total loss	**0**	**0**	**2**	**0**	**1**
Close loss	0	0	1	0	1
Large loss	0	0	1	0	0

*Close and large scores are defined as wins/loses of one and two-goal differences, respectively.

Coding agreement was determined using inter- and intra-observer reliability, calculated using frequency and duration (seconds) data using the formula agreements/(agreements + disagreements) x 100. Inter-observer reliability was examined comparing PR and an independent trained observer's (qualified coach) codes of a same half-time talk performed at

separate occasions. Agreement achieved was 93% and 90% for frequency and duration data. PR checked intra-observer reliability coding the same two half-time talks after coding bouts of four half-time talks. This resulted in the same talk coded five times and verification ranged between 91-94% and 86-92% for frequency and duration data. Both reliability scores exceeded the accepted 85% threshold (van der Mars, 1989).

Interviews

Each participant was engaged in one digitally recorded individual interview during the second week of December 2019 within a private office at the club's training ground. An interview schedule was deductively developed and adjusted following a pilot interview with an external qualified coach. This resulted in five questions' style and order being amended, with the final interview schedule including: 1) biographical and profile questions; 2) considerations about the structure and delivery of half-time talks; 3) questions regarding their utilisation of different behaviours within this environment; and 4) video-stimulated recall about actual behaviours utilised.

A flexible semi-structured approach was employed with open-ended and follow-up probing questions being prepared for each interview section. PR conducted all interviews by actively listening and valuing participants' responses while maintaining a neutral attitude that did not lead coaches to their personal views or desirable answers (Smith & Sparkes, 2005). This strategy was deliberately employed to encourage participants to share their own thoughts and ideas about behaviour adoption (Booroff et al., 2016).

Video-stimulated recall questions were deemed necessary to enable participants recalling their cognitive activity during original events and enhancing their 'think aloud' processes (Lyle, 2003; Whitehead et al., 2016). After participants had developed their thoughts underpinning the utilisation of behaviour (interview section 3), PR showed them a video example involving an own previous coaching event related to the topic they were describing (Stodter & Cushion, 2019). Coaches were allowed to stop the video sequence at any point to verbalise their emerging thoughts (Meier & Vogt, 2015). When the passage had ended, PR posed open-ended questions such as 'what were your thoughts at the time?' to promote recall of the original events and minimising the effects of retrospective reflection (Lyle, 2003). Interviews ended offering participants the opportunity to seek clarification or ask any questions about the research project. They lasted between 46 minutes 18 seconds and 61 minutes 43 seconds (average: 52 minutes and 25 seconds).

2.2.4 Data Analysis

Systematic observation data

Observational data were imported into Sportscode© Gamebreaker (version 10) and coded using the adapted bespoke coding panel. Coded data were manually checked for double counting and behaviour durations, and then exported to Microsoft Excel (2010) with final frequency counts and durations for each behaviour across each talk being calculated. Mean frequency counts for each coach were determined dividing the sum of each coach's behaviour count by four (i.e., the total number of talks analysed per coach and excluding the initial habituation talk). Behaviour durations were converted to seconds before calculations were conducted. Mean percentage time for each behaviour was estimated by dividing the mean behaviour duration by the total behaviour duration and multiplied by 100.

Interview Data

Interview data were transcribed verbatim immediately after the interview process and yielded 52 pages of single-line-spaced text. Thematic analysis was conducted following Braun's et al. (2021) six-phase procedure. Initially, PR familiarised with data and labelled codes within the data set. This process started deductively with inspection of text fragments that contained information about the half-time talk's structure, contents, and coach behaviours then followed by inductive analysis. Codes with shared meanings around a core concept were grouped into similar candidate themes. These were then developed, reviewed, and refined ensuring they matched both data and coded extracts, until a final structure of higher and first order themes were decided (figure 1).

Once the refined themes had been defined and named, they were exported into a matrix that enabled comparison of the coded categories between coaches (Morse, 2010). To enhance rigour, the thematic structure, theme definitions and names, associated codes, and quotations examples were presented to co-authors (Smith & McGannon, 2018). They acted as critical friends appraising PR's analytical decisions and promoting reflective discussions. This resulted in two higher-order theme names and definitions being changed and the collapsing of two former first-order themes into one ("Adapting your feedback valence and interventions to the context"). This process addressed the first author's isolation within the analysis and data overload (Foulger, 2010).

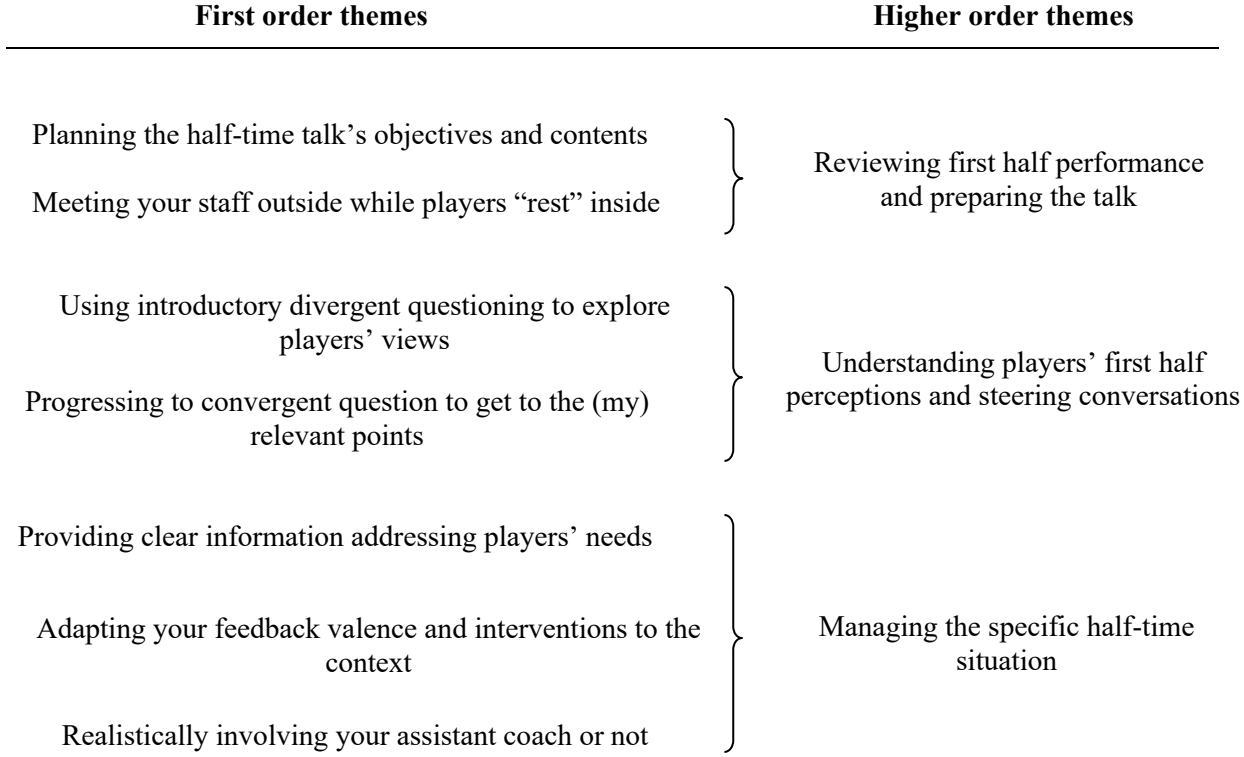

Figure II.1. Higher and first order themes of interviews

2.3 Results

Results demonstrate that coaches mainly provided instruction and feedback. Only Jacinto (U10's) employed fewer of these behaviours, whilst also demonstrating increased management, use of questioning, reinforcement, and in-talk player participation compared to the other coaches. Moreover, in-talk player participation decreased as a function of age-group coached – that is, older age groups presented lower levels of in-talk player participation (Table 4).

Primary and secondary behaviour analysis revealed that almost all coaches asked a higher number of convergent questions than divergent questions. Only Jacinto (U10's) exhibited higher divergent than convergent questions, and Amador (U13's) presented balanced question type ratios. Both Jacinto and Amador also engaged players in greater time of in-talk player participation response and self-initiated than the other participants. Furthermore, Jacinto, Rogelio (U14's), and Damián (U15's) were more balanced between positive and negative/corrective feedback values than the other coaches; with four coaches providing higher negative feedback compared to corrective. The highest pre-talk player participation before coaches entered the changing room was amongst the U14 and U15 age-groups, whereas lower values were found amongst all other age groups (Table 5).

Table II.4. Mean % time and standard deviations of total behaviours during half-time

Total Behaviours	**Jacinto** U10	**Amador** U13	**Rogelio** U14	**Damián** U15	**Rafael** U18
Pre-talk player participation	0 (0)	3.29 (2.99)	13.80 (8.85)	13.93 (6.44)	5.46 (3.99)
Silence	5.79 (2.21)	7.75 (3.88)	9.80 (3.70)	6.54 (1.71)	14.61 (6.61)
Questioning	10.92 (4.43)	7.75 (2.00)	5.08 (1.44)	5.62 (2.16)	7 (2.35)
In-talk player participation	27.17 (11.70)	10 (2.66)	4.21 (1.71)	3.40 (2.80)	2.43 (1.05)
Reinforcement	5.42 (3.42)	1.07 (0.47)	2.11 (1.19)	1.31 (0.86)	0.55 (0.33)
Instruction	23.52 (15.51)	35.72 (5.24)	29.90 (11.98)	36.33 (11.07)	45.58 (7.35)
Feedback	7.85 (2.67)	16.93 (3.43)	19.31 (3.83)	17.98 (2.09)	12.76 (5.20)
Modelling	0.38 (0.38)	1.65 (0.74)	1.86 (1.11)	0.12 (0.17)	0 (0)
Physical assistance	0 (0)	0 (0)	0.07 (0.15)	0 (0)	0 (0)
Management	15.82 (6.76)	6.32 (3.32)	6.93 (3.54)	7.75 (3.60)	4.01 (2.17)
Un/supportive behaviour	0.49 (0.20)	4.02 (1.05)	3.12 (1.42)	6.15 (0.74)	5,70 (1,03)
Confer with assistant	0 (0)	0.94 (1.04)	0.12 (0.25)	0.36 (0.71)	0 (0)
Uncodable	2.63 (2.11)	4.58 (1.54)	3.68 (4.01)	0.52 (0.85)	1.90 (2.46)

*Un/supportive behaviour is composed by praise, scold, humour, hustle, and punishment.

Qualitative findings were grouped into three higher-order themes which were subdivided into further first-order themes. Higher-order themes included: 1) reviewing first half performance and preparing the talk, 2) understanding players' first half perceptions and steering conversations, and 3) managing the specific half-time situation (see figure 1). Considering the mixed-method study design, qualitative findings are presented in the following section and integrated with discussions and quantitative results.

Table II.4. Mean frequency count (FC), % Time, and standard deviations of primary and secondary behaviours during half-time talks

Behaviours	Jacinto		Amador		Rogelio		Damián		Rafael	
	FC	% Time	FC	% Time	FC	% Time	FC	% Time	FC	% Time
Pre-talk player participation	0(00)	0(00)	2.75(2.06)	3.29(2.99)	9(6.06)	13.80(8.85)	10(2.00)	13.93(6.44)	3.75(2.63)	5.46(3.99)
Silence off-task	1(1.41)	1.50(2.24)	2.50(2.38)	4.56(5.64)	1.50(1.00)	2.45(1.17)	3.75(0.50)	2.62(1.62)	3.25(3.30)	9.04(9.50)
Silence on-task	10.75(4.3)	4.29(1.11)	17.25(5.50)	3.19(1.16)	35(7.62)	7.36(3.81)	23.25(7.14)	3.92(1.37)	24.25(2.06)	5.57(1.90)
Convergent questioning	5(3.65)	3.90(3.19)	6.25(4.72)	3.43(1.67)	11(6.00)	3.52(1.06)	10.25(6.13)	3.16(1.97)	8.75(4.35)	3.89(2.37)
Divergent questioning	8(6.88)	7.02(5.40)	5.25(3.95)	4.32(1.56)	4.75(2.99)	1.56(1.07)	5(4.24)	2.46(2.40)	3.75(2.99)	3.11(2.61)
In-talk player participation: response	19(13.93)	22.70(9.32)	9(5.03)	7.28(3.12)	15.50(4.65)	3.58(0.66)	12.50(4.43)	3.40(0.70)	5.75(2.99)	1.65(0.79)
In-talk player participation: self-initiated	3.25(0.96)	4.47(3.35)	3.75(1.71)	2.72(1.69)	1.75(2.36)	0.63(0.79)	0(0)	0(0)	1.25(1.26)	0.78(1.20)
Positive reinforcement	8.25(5.12)	4.98(3.62)	2.25(2.22)	0.81(0.42)	7(4.97)	1.73(1.40)	2.25(0.96)	1.11(1.02)	2(0.82)	0.55(0.22)
Negative reinforcement	1.25(1.89)	0.44(0.60)	0.50(0.58)	0.25(0.36)	1(0.82)	0.38(0.38)	0.75(0.96)	0.20(0.24)	0(0)	0(0)
Positive feedback	2.75(1.30)	3.20(1.82)	6.25(2.64)	4.68(2.39)	11.50(6.07)	9.29(5.23)	10(2.88)	8.70(3.16)	3.25(1.19)	3.10(2.28)
Negative feedback	0.25(0.30)	0.24(0.34)	11(6.32)	8.94(4.71)	7.50(3.15)	5.10(2.30)	5.25(2.39)	6.25(2.60)	5(2.51)	4.87(2.70)
Corrective feedback	2.50(1.91)	4.41(4.57)	4.25(1.50)	3.31(1.77)	7.25(1.71)	4.92(3.02)	3.25(2.50)	3.03(2.59)	4.25(4.03)	4.79(2.06)
Instruction	13.25(5.4)	23.52(15.51)	32.75(15.95)	35.72(5.24)	31.75(10.31)	29.90(11.98)	34(6.63)	36.33 (11.07)	36.75(1.89)	45.58(7.35)
Modelling	0.50(0.46)	0.38(0.38)	2.25(0.83)	1.65(0.74)	2(0.93)	1.86(1.11)	0.25(0.35)	0.12(0.17)	0(0)	0(0)
Physical assistance	0(0)	0(0)	0(0)	0(0)	0.25(0.50)	0.07(0.15)	0(0)	0(0)	0(0)	0(0)
Management	11.50(3.8)	15.82(6.76)	5.25(3.25)	6.32(3.32)	11.25(5.03)	6.93(3.54)	8.75(3.90)	7.75(3.60)	8.50(4.53)	4.01(2.17)
Praise	0.25(0.50)	0.12(0.24)	3.25 (4.57)	1(1.25)	3(3.46)	2.22(2.74)	4.50(3.32)	2.97(3.04)	2.75(1.89)	2.61(2.24)
Scold	0(0)	0(0)	0.75(1.50)	0.48(0.96)	0.75(1.50)	0.46(0.92)	0(0)	0(0)	1.25(1.89)	1.30(2.09)
Humour	0.75(0.50)	0.37(0.25)	2.50(2.38)	1.74(1.34)	1.25(1.26)	0.34(0.32)	2.25(2.06)	1.63(1.27)	0.75(0.96)	0.35(0.52)
Hustle	0(0)	0(0)	2(1.41)	0.79(0.70)	0.75(0.50)	0.11(0.08)	2.50(1.73)	1.55(1.64)	1.50(1.73)	1.44(1.07)
Punishment	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Confer with assistant	0(0)	0(0)	1.50(1.73)	0.94(1.04)	0.25(0.50)	0.12(0.25)	0.25(0.50)	0.36(0.71)	0(0)	0(0)
Uncodable	2.25(1.26)	2.63(2.11)	4(0.82)	4.58(1.54)	4.75(3.77)	3.68(4.01)	0.50(1.00)	0.52(0.85)	1(1.41)	1.90(2.46)

2.4 Findings and discussion

2.4.1 Reviewing first half performance and preparing the talk

Football half-time talks have been suggested to be centred on informational (i.e., game-strategy) content and including minor emotional messages (Avugos et al., 2018). However, hockey coaches have highlighted context as a relevant factor for varying the content of their talks during intermission speeches (Allain et al., 2018). Here, participants viewed their talks to be focussed on both 'technical-tactical' and 'emotional' aspects of the game and reliant on 'the surrounding situation'. Specifically, these talks were intended to understand and manage players' feelings, analyse own and opponents' performance, prepare players for the expected second-half scenario or correcting improvable aspects of the first half:

> *"The main thing is understanding how the player feels during those 40 minutes and his problems…You already know what you've seen and got to learn from what they see. There is also an emotional part that you´ve got to touch. There'll be times that one last 8 and the other 2 and vice versa…"* (Rogelio)

> *"My main aim is trying to rectify those things that haven´t come up as you wanted…"* (Amador)

Coaches agreed that their half-time talks were typically composed of routines outside and inside the changing room, with the four older age-group coaches allowing players to return into the changing room while the staff gathered outside initiating preparation. Previous studies have found various levels of half-time planning. Whilst Alex Ferguson (former Manchester United Football Club Manager) prepared the information to be provided during the last minutes of the first half (Elberse & Dye, 2012), some senior coaches have affirmed writing notes during the first half or deciding their messages on their way to the dressing room (Avugos et al., 2018). It is argued that planning in this context is relevant because of the limited time to analyse immediate game events and address players (Allain et al., 2018), in addition to athletes having depreciated leaders/coaches' speeches that are not sufficiently fluent (Areni & Sparks, 2005; Smith et al., 2018).

In this study, apart from Jacinto (U10's), participants confirmed that they conferred with staff outside the changing room about the first half performance and the messages to include in their talk (Mouchet & Maso, 2018). Meanwhile, observational data show that older players generally exchanged more comments about the first half between themselves whilst waiting for coaches to lead the team talk (see table 5). This observation was confirmed by Rogelio (U14's) and Rafael (U18's), who went on to suggest that these conversations can

provide meaningful information to the coach. Indeed, after preparing the talk outside, coaches affirmed overhearing discussions *en route* to the changing room and enabling these to continue when entering the dressing room (i.e., hearing players' interactions or providing individual feedback privately). However, Rafael spent more time in silence off-task (9.04 %) within the changing room and, interestingly, his players exhibited lower pre-talk player participation (5.46 %) than the under 14 and 15 coaches (Rogelio: 13.80 %; Damián: 13.93 %). These routines and their rationales were explained as follow:

> *"Before getting in, I always meet my staff…They are focused on other aspects. We see what we are doing well, what we can improve and how to do that… I come in and say have a rest, drink, eat and we will talk. In the meantime, I might take individually someone and congratulate or tell him about the man he's been dealing with".* (Damián)

> *"…when you get to the dressing room, I can be in silence when they are talking and drinking water to see what you can hear from them…" (*Jacinto*)*

> *"If I knew these conversations are happening, I'd take more time to get in the dressing room…"* (Rogelio)

2.4.2 Understanding players' first half perceptions and steering conversations

All coaches stated they started the team talk by asking a general divergent question about the first halves' positive and improvable aspects of performance. Coaching literature has emphasised the benefits of divergent questions for facilitating players' higher-order cognitive activities compared to convergent questions (Raya-Castellano et al., 2020; Cope et al., 2016). At half-time, it has been suggested that the first question posed can be a useful tool for capturing players' attention (Mouchet & Maso, 2018). Our participants indicated that they usually started with this behaviour to compare players' perceptions of the first half with their own, and to understand players' emotions. Such approaches were presented as appropriate for 'letting players express themselves'; with one participant, highlighting how this approach had made him aware of some difficulties players were experiencing:

> *"Mainly, seeing what reality they're living. Because it might be a different reality of what I am living. I wanna know what reality they live…I think they [questions] help me more than them. They help me to understand them…"* (Rogelio)

> *"The highest you get, sometimes players might have problems that you haven´t seen and you´ve got to give a solution shortly…Coach, I´ve got this problem and you realise you hadn´t notice".* (Amador)

Previous studies insinuate that longer player participation might relate to a greater use of divergent questions (Raya-Castellano et al., 2021). However, participants expressed that time pressures meant divergent questioning was difficult to incorporate within the context of half-time, because of the confined time to cover all perceived necessary aspects (Mouchet & Maso, 2018). Indeed, in-talk player participation decreased for higher age-groups (Rogelio-U14: 4.21 %, Damián-U15: 3.40 %, and Rafael-U18: 2.43 %), with only the values of Jacinto (U10's) and Amador (U13's) constituting at least 10 % of their talks' total time. This behaviour was particularly high for Jacinto, who engaged players talking for 27.17 % of his talks and who presented the highest values of divergent questioning among all participants.

While convergent questioning has been criticised for coaches positioning themselves as knowledge gatekeepers (Potrac & Cassidy, 2006), participants justified adopting this approach to prevent delivering a rushed and unclear message towards the end of the talk (Breakey et al., 2009). Indeed, four participants used convergent questions (i.e., Amador-U13: 6.25, Rogelio-U14: 11, Damián-U15: 10.25, and Rafael-U18: 8.75 mean times) more frequently than divergent (i.e., Amador: 5.25, Rogelio: 4.75, Damián: 5, and Rafael: 3.75 mean times). Rafael explained that his lower use of divergent questioning was necessary to reduce "excessive" number of opinions from players that could cause division within the group. Indeed, under 14, 15, and 18's coaches recognised rapidly progressing from an initial divergent question to convergent questions that steered players towards the coach desired response. Furthermore, under 10 and 18's coaches suggested that their questions typically required players to describe the performance environment rather than offering solutions to specific problems:

> *"At the start, I'm more divergent and I progressively convert questions in convergent. I wanna see what they perceive and then I wanna help them in the game. Obviously, we´ve got to have clear what we are going to do in the second half…"* (Jacinto)

> *"I ask them what's happening. Some answer. I might have a conversation with him. They can give their opinion. When they tell me the problem, I tell them how to solve it… The player is not prepared to be answering all the time…They need someone telling them that´s right. So it´s reinforced. That´s why we are coaches and players".* (Rafael)

Such approaches appear to confirm findings from previous work within different contexts (e.g., during training; Cope et al., 2016), and have implications for inhibiting players' problem-solving and critical thinking about their in-competition performance. In this study of half-time, introductory divergent questions appeared to be a tool to understand players' realities

more than facilitating players' thinking. Nonetheless, medium-term development of superior tactical knowledge and in-game decision-making has been shown to be assisted by adopting open questioning (García-González et al., 2013). Therefore, it is argued that the same might be true during in-competition breaks, albeit its implementation might reduce time to cover further aspects.

2.4.3 Managing the specific half-time situation

The notion that coaches' half-time talks are transformative to players' performance is somehow dubious because of athletes' limited capabilities for retaining talks' information (Mesquita et al., 2008; Mason et al., 2021). Our data show that participants perceived their views and knowledge necessary to transfer to players, which is further emphasised through the prominence of instruction and feedback behaviours during half-time. This supports the preliminary findings of Madden (1995) whose coaches' solution messages (i.e., instructions) and performance commentaries (i.e., feedback) were most frequently employed. However, the total frequency of instruction and feedback observed in the present study was considerably higher, and, excluding Jacinto (U10's), ranged from 29.90 to 45.58 and 12.76 to 19.31, respectively.

Instructions associated with potential successful outcomes have been perceived by athletes as more effective and inspirational (Smith et al., 2018; Henderson et al., 2021). Indeed, participants outlined the perceived importance of providing clear second half instructions that defined players' roles rather than contributing with very detailed feedback about the first half. In the words of Damián, "players get in the dressing room expecting your solutions to their problems" and some coaches considered a more effective approach threading these messages to issues brought up by players during the interactive introduction. Even if a player provided a correct solution to a game situation, Jacinto (U10's) would be keen to reinforce the response with an instruction to enhance the other players' reception:

> *"…when the talk finishes, they've got to know what you want from them in the second half. That's you job…more than giving feedback is talking about it quickly and switch to the second half plan".* (Rogelio)

> *"I ask because I want them to tell me. So, they get to a point and then, I reinforce their answers…I think with my words, the message gets better to the rest of players than if a player says it…"* (Jacinto)

A balance between positive and negative feedback has been proposed in coaching to avoid the possible shortcomings of excessive negative feedback on player confidence (Groom et al., 2011). At half-time, players and assistant coaches who took part in Zach et al (2022) have suggested that the lead coach's emotional intelligence, positive attitude, and emotional support are relevant to enhance players' second half performance. Nonetheless, under 21 football coaches have been shown to adopt an absence of positive comments and a predominance of criticism (Avugos et al., 2018). Here, only two participants failed to demonstrate a balanced ratio in their frequencies of positive (Amador-U13: 6.25 and Rafael-U18: 3.25) and negative (Amador: 11 and Rafael: 5) feedback. Furthermore, when considering tied first halves, only the rugby coaches taking part in Mouchet and Maso (2018) have been shown to include balanced positive and negative feedback.

Considering the small sample of losing half-times collected (see table 3), coaches highlighted two main contextual factors that could influence their talks' positivity. First, Jacinto (U10's) and Amador (U13's) indicated that they would provide greater positive or negative/corrective feedback purely depending on whether their teams were playing well or bad. Conversely, the other participants also considered the score as an influential factor (Mouchet & Maso, 2018). For example, Rogelio (U14's) recognised that a losing score negatively influenced the valence of his half-time message. Moreover, under 14, 15, and 18's coaches highlighted that even when playing well and winning or playing bad and losing, opposite feedback types were required to reverse the situation or prevent overconfidence:

> *"I'm more worried about the how we´ve done more than the score. Even if we are winning 7-0, if the team does not do things how we planned or how I know they can do, this affects me much more…"* (Amador)

> *"Winning counts as one action more… We´ve played great games and we´ve lost. We´ve got to be able to be above the score…playing well and winning, I'm more negative. I don´t want them to relax. When playing bad and winning I'm not as aggressive because the score supports us. When we are playing bad and losing, I am obviously aggressive* [smile]". (Rogelio)

Positive messages have been suggested to increase athletes' feelings of competence (Soenens & Vansteenkiste, 2020) and belief in teammates (Smith et al., 2018). Indeed, participants were keen to reinforce good performances with Rafael (U18's) and Rogelio (U14's) acknowledging provision of intentional positive verbalisations to individuals that had made mistakes during the first half. Similarly, all coaches avoided transmitting individual negative messages within group scenarios, where possible. For example, Rafael suggested

providing corrections to individuals or in small groups when the team talk ended, if the present circumstances enabled this strategy to be adopted:

> *"I didn´t want they won the second balls... It was more specific of them two…Manuel and Fernando (pseudonyms) stood up and were looking at me. It was like come here I'll explain to you two now…"* (Rafael)

However, under 14 and 18's coaches also recalled having utilised individual negative/corrective messages during team half-time talks that would potentially maximise the collective's performance. Although there is some evidence for increased skill performance in badminton after negative or positive-negative-corrective cues (Tzetzis et al., 2008), athlete inspiration is likely to decrease when positive messages are followed by negatively framed messages (i.e., information about "what players should not be doing") (Smith et al., 2018, p. 219). Thus, Amador's strategy of progressing from negative (i.e., error) to corrective (i.e., solution) feedback at half-time with their U13's players might be appropriate, though his overall frequency of negative feedback (11) was considerably higher than his corrective statements (4.25):

> *"…it´s true that I often start with the negative and then the corrective. Sometimes, I skip the negative and go straight into the corrective…The idea is first explaining where we are mistaking and then giving a solution to overcome it".* (Amador)

Changes in coach tone and volume during talks have been perceived as powerful tools for affecting emotions amongst male and female team-sport athletes (Zach et al., 2022; Breakey et al., 2009). In this study, all participants described their approach of regulating volumes and tones to strengthen or attenuate the meaning of the same message, which is expected to avoid speeches' monotony (Smith et al., 2018). Likewise, Rafael (U18's) suggested that tactical instructions required pauses for facilitating player understanding (Areni & Sparks, 2005) and Rogelio (U14's) affirmed varying his discourse's speed to hide or expose negative feedback to the group or selected individuals. Similarly, Damián and Rafael emphasised the importance of employing different approaches to manage similar circumstances with Rogelio rationalising his different interventions for managing two similar past scenarios (i.e., playing bad and losing):

> *"Against Team A, it [the half-time talk] was aggressive but emotional. The typical of kicking the bottle…Against Team B, it was fully emotional. I did not say anything tactically and we were able to score five goals…I talked about the formula Knowledge + Ability x Attitude…in the world of half-times and people…if I kick a bottle every day, it loses its effect…"* (Rogelio)

"…Drawing, it´d be softer to be more patient. Things are being done well. Very similar to the previous one but perhaps the tone of voice more calmed. Showing faith in the team because we haven´t been lucky in front of the goal". (Damián)

"…if the team's performance hasn´t been good and I'm visibly annoyed, my tone of voice can be more aggressive…Sometimes, I do as if the tone was disappointed. It´ll be more calmed but with a tone of not recognising the team I am seeing". (Rafael)

Although assistant coaches were not recruited, each participant indicated the roles their assistants played during half-time. First, Jacinto (U10's) and Rafael (U18's) emphasised their preference for "the same voice transmitting the message, so it is ordered and concise", despite recent calls suggesting more effective leadership when this is shared (Fransen et al., 2014). In addition, Rogelio (U14's) explained that his assistants provided some individual information to players once the team talk had finished before players left. Following Mouchet and Maso (2018), Damián (U15's) occasionally asked his assistant to summarise key points for the second half. Only Amador's (U13's) assistant appeared to be fully involved with both arranging informational responsibilities during their outside staff meeting to "avoid repetition". He detailed how both worked together complementing each other's messages to ultimately maximise the players' understanding of second half requirements. This is particularly relevant due to evidence pointing to athletes' dislike of two leaders talking simultaneously (Smith et al., 2018). For an effective collaboration between head and assistant coaches, Zakrajsek et al. (2020) suggested that a shared vision and strong communication are required. The benefit and procedure of this approach were noted by Amador as follow:

"…the focus is not always on the same coach…Also, I like talking to my assistant before going inside. I'll be responsible of this and here you´ll take the lead on this...Something else we do is while I'm talking, he intervenes or if he talks, I intervene. It´s not predetermined and the player see much more…how to call it? Familiarity. Our understanding, we bring it into the dressing room". (Amador)

2.5 Practical implications

This study provides some practical considerations for coaching practice. First, because coaches have limited ability to accurately recall game events (Franks & Miller, 1986), conferring their views with their staff before entering the changing room might enable a more accurate revision of the first half and planning the talk. This meeting could potentially remove some emotion from coaches (Zach et al., 2022; Mouchet & Maso, 2018) and enable them to

prepare a more objective message that meets the player needs (Breakey et al., 2009; McKenna, 2021), regardless of the score.

Second, the initial questioning introduction seem to be essential to read the athletes' emotions (Breakey et al., 2009) and enable coaches to adapt their messages (Avugos et al., 2018) to players. Previous studies (García-González et al., 2013) have demonstrated players' superior knowledge and decision-making when combining post-match footage with open questioning. At half-time, most participants affirmed employing reduced divergent questions and facilitating limited in-talk player participation due to time constraints and a need to cover all (perceived) relevant aspects of performance. In fact, only the under 10's and 13's coaches included superior number of divergent questions and enabled higher in-talk player participation than older age-group coaches. Thus, setting routines of pre-talk player participation while staff meets outside (McKenna, 2021) enabling enough player-led discussions might facilitate their knowledge development, while maximising the total time to address players.

Finally, participants working with older age-groups affirmed rapidly progressing to providing information to players and included higher levels of instruction and feedback regardless of players having demonstrated preference for short but meaningful talks (Breakey et al., 2009). Moreover, when observing positively or negatively framed messages during leader's speeches, athletes' have reported feelings of belief in teammates or inspiration decrease, respectively (Smith et al., 2018). However, participants generally included higher negative feedback compared to corrective and only the under 10, 14, and 15's coaches provided greater positive than negative. Therefore, there might be a benefit in balancing the valence of feedback and considering a less-is-more approach to instruction. Specifically, the use of less verbal messages combined with more eloquent vocal factors and non-verbal expressions might be critical for players perceiving these as more meaningful (Breakey et al., 2009), persuasive about first half performance (Van Kleef et al., 2019), or inspirational (Smith et al., 2018).

2.6 Limitations and future research

The design restricted the number and gender of recruitable participants to the study and, thus, the generalisability of results and findings is limited to the study context. In addition, all half-time talks were home-based, and the mean values of coaches' behaviours were calculated at half-time with various outcomes. Moreover, the singularity of participants meant that qualitative findings are limited in the exploration and understanding of the breadth and scope of this context with alignment between quantitative and qualitative data not always being

possible. Finally, the inclusion of assistant coaches, technical staff, or players would have undoubtedly enhanced the data set.

Thus, assessing players' subjective perceptions of talks could increase our understanding of how athletes interpret coaches' behaviours (Breakey et al., 2009) and future studies involving (quasi)experimental designs could also compare various half-time coaching strategies and determine their effectiveness. Furthermore, considering the emotional nature of half-time (Van Kleef et al., 2019), it is also recommended to explore male and female coaches' behaviours at home and away venues during this situation. Additionally, whilst recent coach development research (Raya-Castellano et al., 2022a) has managed to align coaches' intentions and behaviours after engaging them in video-based reflection and discovery tasks, it would be interesting to verify the impact of these activities on coaches' behaviours during more 'emotional' situations such as half-time.

2.7 Conclusion

This study has facilitated the understanding of five youth coaches' behaviours and perceptions about their half-time talks and suggests similarities and differences attributable to their individual beliefs and phases of development coached. Most coaches mainly employed instruction and feedback during half-time except the under 10's coach, who enabled players to express themselves for greater time compared to any other behaviour. In addition, only the under 10 and 15's coaches presented balanced values between positive and negative/corrective feedback, with all participants highlighting their tones and volumes as essential modulators of their messages' meaning. Moreover, only the under 13's assistant coach appeared to be fully involved planning and complementing the lead coach's half-time talk. Hence, it is suggested that the amount, valence, vocal factors, and transmitter of messages in addition to facilitating players with opportunities for thinking and discussing are relevant aspects for delivering half-time talks in youth team sports.

Chapter 2: Developing coaches' knowledge underpinning behaviour utilisation and affecting the knowledge-behaviour transfer

STUDY III:

- Specific aim 3: To consider youth coaches' knowledge about behaviour utilisation during post-match video-based feedback sessions.
- Specific aim 5: To understand the impact that reflective and experimentation tasks can have on coaches' knowledge about their practice over time.

International Journal of Sports Science & Coaching

Original Research

International Journal of Sports Science & Coaching
0(0) 1–12

DOI: 10.1177/17479541211017276
journals.sagepub.com/home/spo
SAGE

Post-match video-based feedback: A longitudinal work-based coach development program stimulating changes in coaches' knowledge and understanding

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Abstract

The literature regarding formal coach education and development highlights issues of transference of usable knowledge to the real-world context. This study sought to engage coaches from a Spanish football academy in a longitudinal work-based coach development program (CDP) focused on the delivery of post-match feedback. The CDP was delivered over a 23-month period through collaboration between a sport pedagogue researcher-practitioner, the Academy Management Team, and an experienced research team. The study adopted a case study design, utilizing a multiple method data collection strategy that occurred in several stages: 1) Systematic observations (Sep–Dec 2018) and 2) debrief (Jan 2019), where baseline coach behaviors and underpinning knowledge were recorded; 3) a workshop and a directed task (Mar 2019), encouraging coaches to apply new knowledge; 4) a directed task 2 and reflective interview (Apr/May 2019), facilitating coaches' reflection on their past deliveries and rationalization and planning of their forthcoming sessions' delivery and 5) a consolidation interview (Apr 2020), capturing knowledge stabilization. Qualitative data suggest that there was an increased understanding in the adoption of behaviors including corrective feedback, silence, questioning, and player participation throughout the CDP. In addition, coaches' self-reflection found acceptance of their coaching delivery or a disconnect between their desired and actual behaviors during the delivery of video-based feedback. This study provides a preliminary framework for further implementation and exploration in developing coaches' knowledge and understanding of delivering post-match video-based feedback.

Keywords

Coach education, coaching behaviors, knowledge development, post-match

3.1 Background

Coach development programs (CDP) have received considerable attention in recent years for their perceived impact on coaching practice (Allison et al., 2016). It has been suggested that coaches learn through formal (i.e., accredited courses), non-formal (i.e., workshops, talks, etc.), and informal (i.e., day-to-day coaching, observations, or discussions with other practitioners) modalities (Lyle & Cushion, 2017), although these rarely occur in isolation (Colley et al., 2003). Whilst formalised CDPs have been criticised for being too theoretically driven and de-contextualised from practice, the informal mode is suggested to be more effective for coach learning (Cushion & Nelson, 2013; Mesquita et al., 2014). However, the effectiveness of CDPs has often been claimed by showing behaviour change at post-intervention stages (Stodter & Cushion, 2019).

The impact that formal CDPs have on coaches' development has been questioned because these events result in limited changes of knowledge and behaviour (Nelson & Cushion, 2006; Cushion et al., 2017). For example, Stodter and Cushion (2014) examined the development of two coaches after participating in a National Federation's 'Youth Coaching Module'. Their findings suggested coaches' rejection of new concepts due to incompatibility with previous knowledge or lack of application within their contexts. Similarly, Stodter and Cushion (2019) compared the learning of coaches in a formal coach education group and a group of coaches who did not take part in any CDP. Coaches in the education group demonstrated increased understanding of the use of questioning and whole-part-whole structures, though this translated to minimal changes of behaviour. It was suggested that the ineffectiveness of this CDP might be due to coaches' utilization of different approaches without critical consideration of their implications. Therefore, coaches appear to relay on behaviours that have previously worked, not necessarily meeting their players' needs.

Reflective practice has been proposed as a helpful mechanism that supports coaches to think more critically about their practice (Gilbert & Trudel, 2001), and brings tacit knowledge from the sub-conscious to conscious level (Cushion, 2016). Thus, examination of behavioural data, video-based feedback, and peer conversations have been employed to facilitate reflective practice of youth coaches from different sports (Partington et al., 2015; Wardsworth et al., 2018; Voldby & Klein-Døssing, 2019). Nonetheless, coaches appear to merely describe their plans and intentions without questioning its validity (i.e., single-loop learning) (Voldby & Klein-Døssing, 2019) rather than comparing their ideas and reasoning about coaching against their actual behaviours and underlying rationales (i.e., double-loop learning) (Argyris & Schön, 1974).

CDP implemented by National Governing Bodies (NGBs) has been compared to a process of indoctrination and control (Cushion & Nelson, 2013; Griffiths et al., 2016). For example, coach developers working for the NGB and supporting youth coaches in their clubs have been shown to adapt the meaning of 'player-centred' in their interest to dominate coaches (Cushion et al., 2017). In contrast, Cope et al. (2020) found that an unaffiliated coach educator empowering coaches and assisting them with reflective conversations enhanced their experience. Furthermore, positive changes (i.e., reduction of technical practices, direct management, feedback, and convergent questioning; increase of total questioning) were reported although might not exclusively relate to the intervention due to the multiple variables surrounding applied coaching environments and 'out of practice' activities coaches engage in on a daily basis. Hence, it is suggested that in-club visits from independent coach developers empowering and caring for learners might be more appropriate for developing coaches.

Most systematic observations of youth football coaches (Partinton et al., 2014; Smith & Cushion, 2006) and CDPs (Cope et al., 2020) have been delivered within pitch-based scenarios. Although contemporary learning frameworks (i.e., ecological dynamics, skill acquisition, and constructivist learning theory) advocate for less prescriptive approaches (Otte et al., 2020; Williams & Hodges, 2005; Light, 2008), studies have continually identified coaches' frequent use of 'instruction' and 'feedback' (Partington & Cushion, 2012; Ford et al., 2010; Raya-Castellano et al., 2020). Video-based feedback (VBF) sessions have typically been studied qualitatively to understand perceptions of factors influencing its delivery (Groom et al., 2011; Middlemas & Harwood, 2018), with a growing preference for balanced positive and negative sequences of video (Groom et al., 2011), active participation of players (Wright et al., 2016) and cautious use of individual feedback (Nelson et al., 2014). Only one study has systematically observed team-based VBF sessions at a youth academy with coaches most utilised behaviour being feedback (Raya-Castellano et al., 2020), and no examples were identified of studies that have attempted to develop coaches in the delivery of post-match VBF sessions. Therefore, combining objective and subjective data (Dugdale et al., 2020), the current study aimed to investigate changes in coaches' knowledge and understanding during a longitudinal CDP developed and delivered by a sport pedagogue researcher-practitioner.

3.2 Method

3.2.1 Research context

This study was conducted at the academy of a club competing at the Spanish *La Liga 123*. The academy comprised eleven teams (under 9 to under 19) all playing in competitive

leagues. The Academy Manager and Head of Methodology were responsible for the development of coaches and the coaching curriculum, which did not include content regarding VBF sessions. They identified coach communication as an important developmental area amongst their coaches and welcomed a sport pedagogue (henceforth referred to as PR) and research team in assisting the club.

To encourage coaches to embrace this new department, the sport pedagogue was invited to several events and meetings and was introduced to all academy staff, with reference to his experience working at other European academies. The Academy Manager continually highlighted the importance of communication in coaching and the CDP actions PR would be undertaking. It was emphasised that all interactions between participants and the sport pedagogue would be confidential.

3.2.2 Participants

Three male Spanish football coaches consented to participate. The under 15's coach withdrew, expressing difficulties in communicating whilst being recorded. This coach's team had experienced a poor run of form and faced relegation; something that within the Spanish academy system would have been detrimental to the who academy. As a result, only two coaches participated in this study. Both Pedro and Juan (pseudonyms), who worked with the under 9 and 13 age-groups, completed the full CDP. Their pen pictures are presented below (Table 1).

Table III.1. Coaches´ profiles, qualifications, and experience

Name (Pseudonym)	Pedro	Juan
Age	23	36
Age-group coached year 1	Under 9 Lead	Under 13 Lead
Age-group coached year 2	Under 10 Lead	Under 19´s Assistant
Highest coaching qualification	UEFA A License	UEFA Pro License
Highest level of education	BSc Sport Sciences	A Levels Equivalent
No. of years playing professionally	0	15
No. of years coaching experience	6	3
No. of years coaching youth	6	3
No. of years' delivering video-feedback	1	1
On-going relevant CPD during year 1*	0	0
On-going relevant CPD during year 2*	2	0

* During year 2, only Pedro undertook education (PGCE in PE and a performance analysis course).

3.2.3 Procedure

Prior to data collection, ethical approval was received from a university ethics committee (ref: 781/CEIH/2019); coaches were informed about the purpose of the study and provided signed informed consent before the study commenced.

All competitive fixtures were filmed by volunteers, and coaches prepared VBF to be delivered in the dressing room before the subsequent training session. The sport pedagogue took field notes after each session that enabled engagement in reflective and reflexive dialogue (Attia & Edge, 2017) with the research team.

Coaches in this small-scale, in-depth case study CDP were purposively sampled based on 1) their limited experience delivering VBF sessions, 2) plenty opportunities for observation, and 3) the Academy Management Team's perceived positive attitude towards their development. The CDP, and associated data collection, occurred in several stages: 1) Systematic observations (Sep-Dec 2018); 2) debrief (Jan 2019); 3) workshop and directed task (Mar 2019); 4) directed task two and reflective interview (Apr/May 2019); and 5) consolidation interview (Apr 2020).

3.2.4 Data collection and analysis

Systematic Observations

The lead coach and players met in the changing room up to three days after the previous game and delivered VBF sessions with post-match purposes. Twelve sessions were filmed using a digital video camera (Sony HDR-CX900E, China) mounted on a tripod, and ensuring the projector screen and all players were visible. The first session for each coach was used to familiarise coaches and players (Darst et al., 1989) and was omitted from final analyses. Each coach was then filmed over an 11-week period (1st of October to 17th of December 2018), with a total of ten post-match team-based VBF sessions analysed. Thus, five sessions for each coach (average duration: Pedro, 11.33 ± 2.60 minutes; and Juan, 25.13 ± 4.79 minutes) were used to define coaches' baseline behaviours.

As there are no validated systematic observation tools to analyse coach behaviour within this context, we followed procedures adopted elsewhere (Raya-Castellano et al., 2020). To ensure appropriateness of the instrument for this specific study, continuous consultation occurred between PR and the research team. A familiarization session for each coach was pilot coded to explore the coaches' behaviours using the modified instrument. This enabled the research team to identify the behaviours across each session prior to inclusion/exclusion from the final behaviour categories (Table 2).

Table III.2. Definitions of coach behaviours during post-match VBF sessions

Behaviour	Description
Positive feedback	Supportive verbal statements or gestures provided by the coach to show his satisfaction with player/s´ performance. e.g., *'That´s brilliant, that´s exactly what I wanted'; 'Great turn, Scott'.*
Negative feedback	Unsupportive verbal statements or gestures provided by the coach to show his dissatisfaction with player/s´ performance. e.g., *'That wasn´t good enough'; 'You aren´t getting in the half turn'.*
Corrective feedback	Corrective verbal statements provided by the coach that contain information specifically intending to change/improve the player(s) performance in future similar situations. e.g., *'Try to get wider next time'; 'You probably don´t want to be levelled with the wide player'.*
Silence	Coach is visibly engaged observing the game in the video in silent or performing other different action such as waiting for a player's response, standing, walking.
Convergent questioning	Limited number of correct answers/options – closed responses. e.g., *'What is the right thing to do in this situation dribbling or passing?'; 'Who´s the free man?'.*
Divergent questioning	Multiple responses/options – open to various responses. e.g., *'What would you do in this situation?'; 'Tell me what you think you need to get better at'; 'What else could you have done?'.*
Player participation	A player actively verbalises or demonstrates the right or wrong decision or execution of a skill, technique, movement, positioning, etc. at any given point of the session.
Positive & negative reinforcement	General statements agreeing or disagreeing with the intervention or response/s provided by one or more players. e.g., *Positive: 'Exactly'; 'Liked that'. Negative: 'No'; 'I don´t agree with that'; 'Not sure about that'.*
Cueing convergent	Verbal cues or prompts with limited options directing players´ attention to a sequence of footage without showing support/dissatisfaction with the player/s´ performance. e.g., *'Martin's driving in to commit the defender'; 'He is between the two center backs'.*
Cueing divergent	Verbal cues or prompts with unlimited options that direct players´ attention to a sequence of footage without showing support or dissatisfaction with the player/s´ performance. e.g., *'Look what he's doing'; 'Look at his movement'.*
Management direct	Management that contributes to organizing turns allocations and the sessions´ structure, content or information presented. e.g., *'Let´s see Paul´s thoughts'; 'I want you to get in threes'; 'Today's aim is transitioning'.*
Management indirect	Management that contributes to organizing the technical equipment. e.g., *'See if this wants to work', 'Pause it there', 'Has anyone seen the clicker?'.*
Management criticism	Management that demonstrates displeasure at the player(s) behaviour during the session. e.g., *'Stop talking, Kevin'; Keenan, it´s the third time I´ve got to stop the session'; 'You´re late again'.*
Humour	Jokes or content designed to make players laugh or smile. e.g., *'Have you eaten a steak for lunch?'; 'Brilliant pass' (irony).*
Punishment	Specific punishment following a mistake or for disruptive behaviour. e.g., *"Get out".*
Uncodable	Any other behaviour not fitting any of the previous categories.

All sessions were coded with Sportscode© Gamebreaker (version 10) and exported to Microsoft Excel 2010. This generated a frequency count and duration for every behaviour within each session. Mean frequency count and percentage time were calculated by dividing the sum of every behaviour's count within each session by the five sessions delivered by each coach. Duration data were converted into seconds, and mean durations for every behaviour were calculated dividing the sum duration of every behaviour by the five sessions. Mean

percentage times were calculated dividing the mean duration of each independent behaviour by the sum duration of behaviours and multiplied by 100.

Intra- and inter-observer reliability for frequency data were calculated with the formula (agreements/ agreements + disagreements) x 100. Duration data were converted into seconds before utilizing the formula. Intra-observer reliability was checked by PR who coded the same session twice after bouts of five sessions. Verification achieved 92% and 90% agreement for frequency and duration data, respectively. Inter-observer reliability was calculated comparing PR and a trained observer's same session codes. Agreement achieved was 88% and 87% for frequency and duration data, respectively. Both reliability checks obtained lower scores (between 2 and 11%) than the achieved by Ford et al. (2010), but still exceeded the accepted 85% reliability threshold (van der Mars, 1989).

Debrief

Debrief interviews were conducted with participants to explore their thoughts and experiences of their sessions without knowing their behavioural profiles. These were intended to elucidate Pedro and Juan's beliefs, knowledge, and understanding on the influence of coach behaviours on player learning and development. Specifically, we were keen to examine their use of questioning and silence as pedagogical tools in this specific context and how this might transfer into training sessions (Table 3). These behaviours have been highlighted for facilitating players' cognitive engagement (Ford et al., 2010; Raya-Castellano et al., 2020).

Table III.3. Debrief interview questions

Behaviour	Number	Interview questions
Feedback	1	What type of feedback do you normally give during your post-match VBF sessions?
	2	Would you provide individual negative feedback within a group session? If yes, under which circumstances?
Questioning	3	What type of questions do you normally use during your post-match VBF sessions?
	4	What would you do if players cannot answer a particular question?
	5	Do your questions differ during training compared to VBF sessions? If yes, how are they different?
Silence	6	When does silence can be used to facilitate players' learning during your post-match VBF sessions?

Workshop & directed task

On the 4th of March 2019, both coaches attended a workshop within an office in the club's training ground, where research findings applied to coaching were presented. This was

prepared between PR and the Academy Management Team and leaded by PR who encouraged frequent input from coaches about the specific aspects addressed. The Head of Methodology was present during the entire 50-minute workshop and assisted PR by asking him questions regarding the theoretical frameworks presented or emphasizing PR points. Both PR and the Head of Methodology remained neutral without providing practical guidelines regarding how to behave during post-match VBF sessions.

Firstly, the workshop introduced the behaviours observed during the post-match VBF sessions and presented the ideas from Williams and Hodges (2005), regarding the utility of prescriptive frequent and immediate feedback, compared to reduced and delayed feedback, whilst exploring additional contributory factors (i.e., bandwidth feedback and questioning). Questioning was then discussed as a behaviour for stimulating implicit learning and linked to the use of silence for enabling players thinking and answering (Cope et al., 2016). Likewise, convergent and divergent questions were defined as questions restricting or broadening the possible response options (Harvey & Light, 2015), without suggestion of which one is more beneficial or when to adopt them within VBF sessions. The workshop concluded by asking coaches to consider when, where, and how they incorporated questions into their feedback process during VBF. Coaches then delivered two VBF sessions after the workshop which provided an opportunity for implementing ideas.

Directed task 2 & reflective interview

Coaches were given a breakdown of their behaviours three days before the reflective interview. To facilitate that coaches could identify consistencies or inconsistencies between their actual and desired behaviours, previous self-reflection on their data was allowed. The reflective interview schedule explored: 1) recall of behaviours and its definitions; 2) biographical and demographic questions; 3) coaches' perceptions of their behavioural data; 4) questions examining the alignment between current and desired behaviours; and 5) questions to ascertain their intended behaviours' organization within particular clips. If required, video clip examples (i.e., stimulated recall) were shown, followed by a general open question and a subsequent question aiming that coaches rationalised their actions (Applebee et al., 2003).

Consolidation interview

After reflective interviews, there was no contact with the coaches regarding their VBF sessions. The second season, coaches were encouraged to implement what they had learnt within their new contexts (see table 1 for group and role details). To determine the extent to

which participants' knowledge and understanding had stabilised and changed, a final consolidation interview was conducted with each coach.

Debrief, reflective, and consolidation interviews of coaches averaged 21 minutes 24 seconds ± 1.37, 44 minutes 20.5 seconds ± 5.5, and 70 minutes 25.5 seconds ± 2.9; and yielded 6, 16 and 23 single-line-spaced pages of text, respectively. Interviews were transcribed verbatim, and PR read transcripts several times during the analysis phase to ensure familiarity with the data (Braun et al., 2016). In-depth analysis was conducted using thematic analysis procedures (Hanton & Jones, 1999). This process started deductively with inspection of the predetermined themes followed by line-by-line examination of each transcript to identify further emerging themes (Scanlan et al., 1989). To consider changes between interviews, a matrix of concepts was generated that included initial concepts, categories, and subcategories. Concepts were deemed to have been modified when qualitatively different or more frequently used (Saldaña, 2003). Rigor in the process was maintained through frequent discussions amongst the research team who critiqued the analytic decisions of PR until agreement on thematic structure, names, descriptions, and meaning of themes was achieved (Figure 1).

First order themes	Higher order themes
Positive vs negative feedback Corrective feedback: concept & rationale Corrective vs negative feedback Corrective feedback within positive clips	Feedback
Questioning & player participation: rationales Questioning types influence player participation Re-questioning: rationale	Questioning & player participation
Timing During clip display: observation After questioning: player thinking	Silence
Initial opinion on data Opinion on questioning & player participation Organisation of behaviours Actual vs desired behaviours	Behaviour acceptance or rejection

Figure III.1. Higher and first order themes of reflective and consolidation interviews

3.3 Results, findings, and discussion

3.3.1 Phase 1: Systematic observation & debrief

Systematic observations and debrief suggested varied initial patterns of behaviour (table 4) and levels of knowledge and awareness during coaches' VBF sessions.

Table III.4. Mean % time and frequency count (FC) of coach behaviour during post-match VBF

Name (Pseudonym)	Pedro		Juan	
	Mean % Time	Mean FC	Mean % Time	Mean FC
Feedback	**22.6**	**18.4**	**53.2**	**98.4**
Positive feedback	8.6	9	13.7	28.2
Negative feedback	2.3	1.8	14.1	29.6
Corrective feedback	11.7	7.6	25.4	40.6
Questioning	**11**	**28**	**5.9**	**28.2**
Convergent questioning	5.1	13	4.1	21.8
Divergent questioning	5.9	15	1.8	6.4
Silence	**17.9**	**33**	**9.9**	**60.8**
Player participation	**19.9**	**45**	**5.4**	**29.2**
Positive reinforcement	4.8	12	0.6	5.2
Negative reinforcement	0.6	2	0.2	1.2
Cueing convergent	5.2	7.6	11.2	33.6
Cueing divergent	1.3	2.4	1	7.2
Management direct	13	28.6	7.8	28
Management indirect	0.1	0.6	0.2	0.2
Management criticism	1.6	1.8	2.5	5.6
Humour	1.1	1.6	1.2	0.8
Uncodable	1	1.4	1	1

*Behaviours in bold and their subcategories are focus of the discussion.

Pedro's most employed behaviour was 'feedback'; normally positive, though corrective statements lasted longer. These were interspersed with shorter bouts of silence and a marginally greater number of divergent questions; which might suggest why players contributed to discussion for almost the same amount of time that Pedro provided feedback. Furthermore, qualitative data reflected Pedro's intention to use as much positive feedback as possible, and his preference for open questioning as a mechanism to extend the response options, and to encourage player engagement in higher order thinking. However, he seemed unsure about how and why his questioning was more convergent during training compared to during VBF sessions. Moreover, Pedro used silence for 17.9 % of the session, though he was not conscious of why and when he was being silent:

> Pedro: "*... I think during training I do more closed questions compared to video sessions.*

PR: *Why do you think you do that?*

Pedro: *Eh…good question* [smiling]*…It's a different coach's attitude. The video is more relaxed and the other* [training] *you want to rise up the tempo. So that there aren't many stops and maybe you give more direct feedback.*

PR: *When does it make sense being silent within video sessions?*

Pedro: *I have never thought about that…I believe silence doesn't make sense within a video session. You are showing something and if you don't give any feedback or if they answer and you don't tell them anything, it doesn't make sense".*

In contrast, Juan spent 53.2 % of the VBF session providing feedback, with almost half (25.4 %) being corrective. He demonstrated frequent, but short, spells of silence and a dominant use of convergent questions, that appeared to facilitate limited player participation. In his debrief interview Juan's awareness of utilising these behaviours was ascribed this to his players adapting to a new game format. Conversely, when asked about his use of questioning types alongside his silence, he demonstrated a lack of awareness of his observed behaviours:

> *"I use more open questions, I think…It's trying to get them to see and assess the possibilities or choose other options such as the other side, switch it, turn, etcetera. I would try more open, to see if they're able to interpret the different options they have in that play…During video sessions, I don't normally do silence. I always try to explain with images a little bit more. As I have the opportunity to show and they watch themselves on video, I prefer not to…".*

Further, when asked about his approach when players could not answer a particular question, he suggested:

> *"If it's an open question, I would directly tell them the different options…because perhaps there are situations they cannot interpret, and I can".*

Studies concerned with VBF have tended to be qualitative (Groom et al., 2011; Middlemas & Harwood, 2018), and have not focused on the effects that specific coach behaviours have upon players. While individual VBF sessions include more positive feedback than negative (Mason et al., 2020), data from this study highlighted preferences toward positive and corrective feedback approaches. Previous studies have found that combinations of negative and corrective feedback can facilitate learners' correction of errors when their task performance is not appropriate (Tzetzis et al., 2008). Thus, VBF sessions have the opportunity to enhance players' confidence (Groom et al., 2011) whilst also identifying areas for further development. However, a recipient's openness to receive feedback in front of their peers should be

considered, especially if highlighting specific improvable aspects of the game (Nelson et al., 2014).

Coach questioning practices have, typically, been shown to stimulate players' low order thinking, and often answered by the coach (Partington et al., 2014; Cope et al., 2016). Divergent questions are suggested to encourage individuals to engage in higher order thinking and, thus, generate more sophisticated responses and new knowledge (Harvey & Light, 2015). Pedro exhibited a tendency toward divergent questions, whereas Juan demonstrated higher propensity for convergent questioning. Interestingly, in a similar study, Raya-Castellano et al. (2020) found that all coaches utilised greater convergent questions. However, Mason et al. (2020) reported higher levels of divergent questioning being employed by elite Australian Football coaches during individual post-match VBF sessions, though this might be attributable to the age and phase of development differences between the two samples.

In this study, coaches' actual and desired feedback were in agreement, though participants demonstrated limited knowledge and awareness surrounding their use of questioning or silence. This supports the epistemological gap reported in literature between behaviour and underpinning knowledge (Partington & Cushion, 2013). In Juan's case, there appeared to be a difference between his ideas of what, when, and how to use questioning and his actual use of questioning (Argyris & Schön, 1974). Furthermore, both coaches were not aware of why they chose to be silent when they did during their VBF sessions. This might reflect their limited experience delivering VBF sessions, or a broader lack of understanding around pedagogic principles.

3.3.2 Phase 2: Reflective interview

Feedback

Pedro maintained his preference for being positive to avoid potential negative influence upon player confidence, although he also explained that this depended on players' previous performance and the difficulty of the upcoming fixture. In addition, he believed corrective feedback was more effective than negative feedback and this could be used either within positive or negative clips:

> *"I think the corrective…is the most useful because you're providing the boy with solutions to his problems… and even to things they do well, you're giving them a wider variety of alternatives. As an example, he has done well because he got passed a rival, but within another game, he had a teammate, and the defender is gonna be better. He's gonna continue trying dribbling and he's not gonna win the duel. And maybe he could have done a 2 v 1. So he knows he has other alternatives".*

Juan was appreciative of his balanced positive and negative feedback and appeared more considered in the use of the latter not being as constructive as corrective feedback:

> "*…I don´t like dedicating much to this is wrong, don´t do that, no. I´d tell him that the best option was the other. I wouldn't tell him not to do it…I prefer showing him another alternative that I think is better... That without emphasising whether is good or bad".*

A balance between positive and negative sequences has been proposed to avoid deteriorating players' confidence (Groom & Cushion, 2005). Participants suggested that inclusion of corrective feedback can manipulate the message provided by a positive or negative video clip and feedback. For both coaches, corrective feedback was more constructive than negative feedback. Pedro suggested that this could be used within positive or negative clips to either propose further alternatives or make corrections. Nonetheless, it is yet to be examined the extent to which players develop their knowledge and/or retain feedback when receiving different combinations of game sequences and feedback. Only Mason et al. (2020) have examined player recall of coaches' feedback one week after an individual post-match VBF session and there is a dearth of quasi-experimental studies in this area. Therefore, providing alternatives to positive and negative game situations might expand players' knowledge, though consideration must be given to the time and type of information, ensuring it is congruent with their learning and playing ability.

Silence

Coaches have previously shown lack of understanding of their silence during training (Partington et al., 2014; Partington & Cushion, 2013). However, long periods of silence used deliberately can empower players to engage in the problem-solving process (Smith & Cushion, 2006). After this CDP, Pedro demonstrated increased awareness in his use of silence and outlined two main instances within his VBF sessions where he did so for the benefit of players. He expressed the rationale for silence after questioning but doubted if his silence while players observed clips was the most effective approach for maintaining under nine players' concentration on the footage:

> *"Regarding silence after my questions, you've got to leave them to be protagonist. So, they get to the solution and are able to see, in that play, what is happening...Perhaps, while we're watching the video, I've got to give less silence because it´s twenty*

seconds. So none gets distracted, to keep their attention…in the play, in what is happening".

Similarly, contradictions between his actual and desired silence values seemed to be encouraging Juan to explore his strategical use of this behaviour to fulfil his session objectives. Apart from being more aware of its application, he contemplated silence as an alternative to maintain concentration on the footage with a potential question to be answered after:

"…maybe I should use [silence] *a bit more…Telling them to watch this play or watch these three plays and after we'll discuss them…I think seeing that I am gonna ask them a question…I think that it helps focus their concentration more and so they see where they might have failed".*

Juan presented more periods of silence, though these accounted for a smaller total percentage duration compared to Pedro (see table 4). To maintain player observation of the clips; Juan was considering longer silences prior to questions, whereas Pedro seemed willing to reduce his silence as an alternative. This could be due to the attention span and cognitive capacity of the under nine's, which might be a factor influencing the delivery of VBF sessions (Middlemas & Harwood, 2018).

Further, at this stage only Pedro was conscious of silence after questions being important to allow players to think and answer. In their analysis of coach questioning practices during training sessions, Cope et al. (2016) found no more than two seconds of post-question silence and after these frames, responses were provided by the coach. Therefore, future studies specific to the VBF context could monitor coaches' silences after their questions and/or the impact that shorter and larger silences might have on the quality of learners' cognitions, responses, and knowledge development.

Questioning and player participation

Pedro proposed questioning as a potential tool for encouraging his under nine´s player thinking, curiosity, and participation. When shown a sequence of his sessions where he was re-questioning a player's response with a second question, he stated:

Pedro: "*It´s the same question, isn't? Don´t know what I´d be thinking…but maybe I have formulated the question and that´s why he has answered to something I didn´t want him to respond. Then, I formulate it* [the question] *again differently*.

PR: *What is your objective for doing this?*

Pedro: *In order to get into what I want them to see in the video. To concrete the final response, but that this is given by them.*
PR: *Could the coach give the information after a wrong response from the player?*
Pedro: *Yes, I could but at these ages within these video sessions, I prefer that they get to the result or the solutions instead of me telling them".*

Re-questioning was a potential mechanism to direct players through a mixture of convergent and divergent questions to the coach's desired response options:

> *"Regarding convergent and divergent, as age increases, maybe the divergent need to increase and convergent decrease. With my group, maybe I need to guide them myself with more concrete questions".*

Juan also believed questioning and player participation were useful for encouraging players' autonomous thinking. When players were unable to answer a question, a second question could be formulated to ensure the players generated the response. Additionally, Juan was able to define the concepts of convergent and divergent questioning, but unable to articulate how to combine them within sessions. When shown a session clip, he described his approach of stopping the footage and divergently asking players to explore the existing alternatives at that instance.

> *"…I would try to turn it around to simplify a bit the response or if I see they're not able to* [respond]*; trying to turn it around to see if from other side, they find the solution and not give it myself straight away. Obviously, if there isn't a way for them to get the response, then maybe I tell them, but I would ask it differently first…Perhaps, before the action happens, stop the play and ask the player involved the options he sees. With the convergent, …it's much simpler for them to answer if I stop the clip".*

Further, when asked about his player participation scores, Juan linked them to his higher use of convergent questions requiring short answers:

> *"Most times they've got to speak is to say yes or no, outside…I imagine the level of participation is lower due to them not having to develop. They aren't questions like if he came what would you do? No, it's simply, who's the free man?"*

Both coaches expressed their desire to use divergent questions to enable players' discovering and generating responses during their post-match VBF sessions. However, Juan's data reflects greater use of convergent questioning that he linked to his reduced player participation. Furthermore, coaches declared that combinations of questions could be used to tease out their own desired responses from the players, which suggest that they positioned

themselves as knowledge gatekeepers (Potrac & Cassidy, 2006). Questions can be probing, stimulating the recall of knowledge and the development of new understandings; or guiding, which can direct players towards responses (Sahin, 2007). Open-ended questions combined with VBF have been shown to develop greater tactical knowledge (i.e., number of self-regulatory concepts and a more sophisticated concept structure) for youth players in an experimental group compared to a control group (García-González et al., 2013). When not well formulated or cueing the desired response, questions might encourage players' convergent thinking, which constraints the exploration of further possibilities of response not predetermined by the coach. This is not to say that coaches should avoid the use of convergent questions. As Pedro suggested, if players do not possess sufficient knowledge to answer a divergent question, a more convergent question could reduce the challenge initially posed. Thus, divergent and convergent questions might be combined to encourage players to generate answers; drawing on existing knowledge whilst enabling new knowledge development.

Behaviour acceptance or rejection

Coaches described the same order in which they planned to sequence their behaviours to favour players' learning. This consisted of silence for player observation being ensued by a divergent question, player participation and coach feedback or a convergent question if player responses had not concreted the coach's pursued response. When asked about his opinion on his current data and whether he was willing to make any future behaviour modifications, Pedro indicated:

> *"...I believe the percentages that came up are not bad because the boy takes part enough...The more the player participates, the better. Because I do a good number of divergent and I use convergent when the boys don't respond to what I am looking for."*

In contrast, Juan was rejecting his delivery and aimed to increase his silence, player participation and re-arranging the order in which his behaviours occurred during particular clips:

> *"Thinking what I said about silence, it seems to me a very good idea…telling them to watch in silence. They would concentrate more and think about the options. But here* [feedback]*, I would have to reduce the time compared to what I wished…First that they become aware whether what they've done is wrong or what other options they had. It would have to come out from them. And afterwards, I can reinforce what they've said".*

Reflection on their own behaviour data provoked different responses for coaches. Pedro was satisfied with his behaviour profile, whereas Juan had found behavioural 'disturbances' (Voldby & Klein-Døssing, 2019) that contradicted his desired behaviours. Because of these 'discoveries, he was planning to reduce his feedback and redistribute the sequence of behaviours within clips (Jarvis, 2009). Therefore, behavioural statistics from coaches' post-match VBF either confirmed or encouraged changes to their desired delivery approach and can be employed with monitoring purposes so coaches self-assess the alignment between their intentions and actual behaviours.

This CDP comprised a workshop and two directed tasks intending to stimulate reflection about coaches' previous sessions and how they might implement content from the workshop within their post-match VBF. This appeared to assist coaches in deciding how to approach future sessions and determine clear expectations that their sessions should include that are better tailored to player benefit. Nevertheless, the mixed-method design of this study does not demonstrate causality between the CDP activities employed (i.e., workshop and directed tasks) and the outcomes achieved in terms of coaches' knowledge development.

3.3.3 Phase 3: Consolidation interview

Pedro

His knowledge seemed stabilised eleven months after the reflective interview took place with minor changes in the meaning of a few themes. When asked about his behaviour profile, he maintained his satisfaction, albeit showed a will to reduce negative feedback even more due to its disadvantages for players. Moreover, Pedro was considering the player as an active cognitive agent much more. Although he seemed willing to interrupt silence with cues, so players concentrated on the footage at the reflective interview; he was now more conscious of enabling players' observing the game without directing players' attention to certain aspects:

> *"I think you don't have to give negative. Use corrective instead. Because maybe in this game it doesn't work but it might do it in the following game. If from such an early age you constrain them, they will play with fear to do. Therefore, you've got to try they don't feel the pressure of I'm not doing this because he said that is bad".*

> "*During the clip, because I don't want to condition them on that particular player. I wanted them to be self-sufficient and focus on what they thought".*

Similarly, when asked about re-questioning, Pedro was now intending to explore player comments that differed to his clip's objective, if these 'fitted' his understanding:

"…what do you see in this play? The boys see things that you hadn't seen. If I see it´s interesting, I guide them and explore where do we get with their responses and my questions…But if they answer useless responses for their learning, I use more convergent to facilitate and guide them to what I was looking for within that clip".

Juan

Comparisons between Juan's reflective and consolidation interviews revealed very little changes in themes' meaning. Juan maintained his belief of divergent questioning facilitating player thinking and proposed planning starting divergent questions for clips to avoid improvisation. Moreover, he seemed more aware of the difficulties under thirteen players could have generating elaborated responses in front of teammates and had decided further options if players were unable to answer a question:

Juan: "*…at these ages, although questions are divergent, the boys don´t always reason enough or are too shy many times. A question that requires a longer response, they shorten it a lot…It´s difficult.*

PR: *What could you do to overcome this difficulty?*

Juan: *…Maybe continue asking questions towards where I want to get. Try to guide them with two or three more convergent questions to where I want to get…or even the participation of a third player to encourage him to take part or to see if they get into any kind of agreement".*

Finally, opposed to the reflective phase, Juan had found alternative approaches to combine divergent and convergent questions during his VBF sessions:

"Perhaps asking the options he has at that instance and once he has seen the clip, asking a convergent where he gives his opinion on whether is right or wrong and propose other alternatives… there are questions that need more thinking. Often what you want is right, you´ve given me the response, but now I want you to identify the why. So they think a little bit more".

Coaches' knowledge seemed stabilised and enhanced from reflective to consolidation interview. Stodter and Cushion (2017) argue that realistic opportunities are required to transfer new knowledge into behaviours within their contexts because concepts are linked to the situations where they are learnt. Thereby, it could be argued that coaches' knowledge settled after eleven months of no contact with PR and the Academy Management Team due to having reflected and attempted to implement knowledge within their particular post-match VBF sessions. Hence, CDPs focused on a particular situation-specific coaching task involving self-reflection and application of CDP content might aid coaches to consolidate their knowledge in

the medium term. Nevertheless, future quasi-experimental studies could corroborate this assumption.

3.4 Limitations

While this research extends literature in the areas of coach behaviour and coach education, it also presented some limitations. Firstly, it is difficult to establish causal relationships between the CDP activities and their impact on coaches, because of the absence of a control group not undertaking any education. Moreover, the quality of coaches' reflection during the second directed task could have been enhanced by incorporating players' anonymous perceptions about their coaches' delivery.

3.5 Conclusion

This bespoke longitudinal work-based CDP constitutes an in-depth exploration of changes in knowledge and understanding achieved by two coaches with varied backgrounds (Agustí et al., 2020) and working with different age-groups. Their varied baseline levels of knowledge appeared to increase and stabilise as the CDP progressed. In addition, this study extends our understanding of the delivery of VBF in junior-elite football and how behaviours can be utilised to fulfil the post-match session objectives.

This research also provides various practical considerations for coaches and coach development practice. In particular, a broad framework for structuring a long-term approach to developing coaches, in relation to a specific issue to bring about positive change in coaches' practice. Indeed, coaches in this study appeared to develop knowledge and awareness during the CDP; particularly due to the clear opportunities to implement ideas and reflect on their delivery. The examination of behaviour data either reinforced coaches' delivery or enhanced their willingness to change. This suggests that a bespoke CDP, comprising multiple learning mechanisms and integrated opportunities for reflection; delivered and supported longitudinally can be an effective approach for coach development in an applied football environment.

STUDY IV:

- Specific aim 4: To assess youth coaches' understanding about the instances during training sessions perceived as better opportunities for asking questions.
- Specific aim 6: To expand knowledge about the impact that reflection and/or experimentation tasks can have over time on coaches' translation of knowledge about questioning timing into a congruent application.

PHYSICAL EDUCATION AND SPORT PEDAGOGY
https://doi.org/10.1080/17408989.2022.2083095

Exploring the 'teachable moments' of questioning during training: a work-based coach development programme affecting behaviour change

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ABSTRACT

***Background*:** Researchers in the field of sport pedagogy have highlighted questioning as a behaviour that facilitates athletes' high-order thinking and problem-solving. However, previous studies have suggested that coaches ask a reduced number of questions during training that are typically convergent and lead players to predetermined responses. Formal coach development programmes (CDPs), intended to encourage the use of questioning, have been scrutinised for their limited impact on coaches' practice. These criticisms have been made without consideration of the instances and situations during training that might present a better opportunity for asking different question types.

***Purpose*:** The purpose of this study was to explore coaches' perceptions concerning potential 'teachable moments' to ask convergent and divergent questions during training at three data collection points, and to associate changes between knowledge and behaviour after a work-based CDP.

***Method*:** Six Spanish youth football coaches working for an elite academy were recruited to a longitudinal study. The study involved a six-week CDP delivered by a coach developer, in collaboration with the club's Academy Management Team, and an experienced research team. Data collection occurred throughout 24-months interspersed by a workshop and two directed tasks organised in several stages: (1) Pre-systematic observations (Sep–Dec 2018) and (2) pre-interviews (Jan 2019), to identify coaches' baseline behaviours and knowledge; (3) a workshop & directed task 1 (Feb 2019), encouraging coaches to experiment and self-discover how to implement questioning within their training contexts; (4) a directed task 2 (Feb–Mar 2019), facilitating coaches' video-based and dialogic reflections about their questions; (5) post-systematic observations (Mar–May 2019) and (6) post-interviews (May 2019), capturing changes in knowledge and questioning after the intervention; and (7) consolidation interviews (May 2020), recording coaches' knowledge stabilisation and further developments.

***Results and findings*:** Four coaches completed the full CDP, whilst the remaining two coaches did not participate in the second directed task. Qualitative data suggest that all coaches developed their understanding of which moments might be most appropriate to ask convergent or divergent questions. However, only the first group of coaches presented congruent changes between the timing in which they asked questions and their perceptions. This involved higher use of convergent questions (during practice) and divergent questions (in-between practices and when the coach stops practice). Conversely, coaches in the incomplete CDP, decreased or maintained their questioning values within most instances and suggested organisational and contextual factors hindering their engagement in this work-based CDP. Therefore, real opportunities to implement questioning techniques combined with reflective practice assisted by a coach developer are proposed to translate knowledge gained during CDPs into observable behaviours.

ARTICLE HISTORY
Received 20 June 2021
Accepted 9 May 2022

KEYWORDS
Coach education; behaviour change; dialogic reflection; question; soccer

4.1 Background

Coach development programmes (CDPs) have received substantial interest from researchers and practitioners in recent years, due to their perceived influence on coaches' practice (Allison et al., 2016). Some formal CDPs have attempted to increase coaches' understanding and utilisation of behaviours (e.g., Stodter & Cushion, 2014), expecting that these can lead players to positive outcomes. However, whilst there is some evidence for coaches' improved understanding and philosophy of practice after postgraduate CDPs (Jones, et al., 2012), formal federative CDPs have been criticised for promoting reduced knowledge development and not affecting changes in coaches' behaviour within their working contexts (Stodter & Cushion, 2019). As such, we propose that work-based CDPs might attenuate these criticisms.

A recent examination of coaches' learning suggests that coaches adopt, adapt, or reject formal CDPs' contents when these match, fit, or mismatch their knowledge structures and coaches perceive the applicability of new knowledge (Stodter & Cushion, 2017). Nevertheless, coaches seem to be provided little opportunities for implementing new concepts within their working environments (Stodter & Cushion, 2016). In addition, formal CDPs' contents have typically been taught through multiple 'fill in' activities, delivered in a rigid order and with defined time parameters regardless of learners' needs (Cushion et al., 2021; Dempsey et al., 2020). Hence, such approaches are believed to generate reduced transference of knowledge into coaches' action (Stodter & Cushion, 2014, 2019).

Conversely, coaches' engagement in reflective practice, assisted by video-feedback and/or a coach developer's 'dialogical action', have been linked to an enhanced developmental experience and changes in coach behaviour (Partington et al., 2015; Cope et al., 2020). For example, in their 12-week CDP, including one-to-one dialogic conversations, Stodter et al. (2021) found that the coach developer's use of open questioning was perceived by coaches as an empowering tool that enabled more relevant discussions about their practice. Similarly, Partington et al. (2015) engaged five coaches in a longitudinal CDP involving attendance to the FA Youth Award and video-based reflections about their behaviours. Whilst participants suggested video-feedback had enhanced their reflection objectivity and willingness to change; changes in the use of instruction, feedback, silence, and questioning were also attained. Thus, it might be suggested that a CDP involving in-context, video-based, and dialogic reflection assisted by a coach developer could be effective for coaches adopting behaviours such as 'questioning'.

The use of questioning has been encouraged to facilitate players' engagement in cognitive activities (Vickers, 2007). Through questions learners can clarify understanding (Engin, 2013; Hill, 2016), recall information (Caram & Davis, 2005), critically reflect on performance (Forrest, 2014), and engage in dialogues and discussions (McNeil et al., 2008). Indeed, questioning has been broadly classified into: (1) convergent, with limited response options; and (2) divergent, offering unlimited response options (Cushion et al., 2012a). Whilst the former might only require fact-seeking knowledge (i.e., recalling); the latter's utilisation has been suggested to prompt learners' higher order thinking skills (i.e., applying, analysing, evaluating, or creating), and its use has been generally recommended (Metzler, 2000).

In coaching, questions represent a small proportion of training behaviours and coaches have been observed chiefly adopting convergent questions, that often lead players to quicker coach-desired responses (Cope et al., 2016; Harvey et al., 2013). However, training sessions are comprised of activity periods, management states, and stops in-between the same practice (Cushion et al., 2012a; O'Connor et al., 2017), and little is known about appropriate question types for varying situations. We argue that no question type is more appropriate *per se*, but instead, the context might determine the extent to which a convergent or divergent question might support player learning. Therefore, criticisms to reduced divergent questioning during training might have been made without fully appreciating when there are better opportunities for asking questions involving limited or multiple response options. Only one study has recorded higher divergent questioning during management states (i.e., in-between practices), with some coaches stating these intervals offer the appropriate conditions for interacting with players (Stonebridge & Cushion, 2018).

Recently, O'Connor et al. (2021) assessed the structure (e.g., type and timing) of the questions asked by 19 coaches during their training sessions without exploring their underpinning perceptions. These are relevant to understand because coaches' questions have been shown not to engage players cognitively (Cope et al., 2016) and formal CDPs attempting to influence coaches' knowledge and use of questioning have had a scarce impact (Stodter & Cushion, 2019). Furthermore, there remains a dearth of work-based CDP studies through which changes in coaches' knowledge can be translated into associated behaviours. Therefore, this mixed-method study examined coaches' perceptions regarding the instances within training that involved opportunities for asking question types and the transference of their knowledge into congruent behaviours after a CDP. Specifically, we sought to understand: 1) what situations do coaches perceive as appropriate for using different question types, before and

after a work-based CDP; and 2) how effective a video-based and dialogical reflective work-based CDP might be for coaches translating their knowledge into behaviour.

4.2 Method

4.2.1 Research context

This CDP was implemented within the academy of a Spanish *La Liga 123* Football Club structured into a 7-a-side phase (under 9-12) and an 11-a-side phase (under 13-19). Excluding the under-19 team staff, all coaches were part-time and generally held both academic and coaching qualifications. The Academy Management Team (AMT) was composed by an Academy Manager, responsible for managing all the academy processes; and a Head of Methodology, who focussed on supervising the learning of players and coaches. Both had been employed at the club for one season, during which time they had developed and began to implement a curriculum with two main areas for coach development: playing style and practice design.

The following season, they aimed to introduce coach communication as another key area of the curriculum. They intended their coaches to become more aware of the influence that their messages' format and style could have on players and desired an increase in the use of behaviours that potentially encouraged players to develop their game knowledge autonomously. Therefore, to support the development of coaches' communication skills, the club employed a coach developer (CD, first author) and engaged an experienced research team.

Previous professional relationships with both members of the AMT and a shared vision on work-based coach development functioning facilitated the CD's access and embedment within the academy. These practitioners were advised by a research team, comprising two higher education staff, with over 10 years' experience each, working in applied football environments and supporting the development of coaches. Moreover, the Academy Manager and Head of Methodology met regularly with the first author to ensure any decisions regarding the CDP aligned with the club's vision and supported the CD informing coaches of any developmental tasks required.

As communication had become an area of the club's curriculum, all coaches attended a meeting that highlighted its importance and the developmental plan for the season. The CD was introduced as an assistant of the AMT, with extensive experience developing coaches' communication. His main duty was highlighted as working closely with coaches and facilitating their reflection about their approach to communication. He was positioned as

another member of staff that would assist coaches and who would share responsibility with coaches for their learning (Bamberger & Schön, 1983).

This balanced positionality was intentionally adopted to avoid the barriers that coach educators from Sport Governing Bodies visiting clubs have previously encountered (Cushion, et al., 2017). Thus, the first author was integrated into the academy environment as any other member of staff would be, but with guarantees of full confidentiality between the CD and coaches during their interactions. Furthermore, we drew on the concept of work-based CDPs as posited by Raya-Castellano et al. (2021). Therefore, 'standard' coach education approaches were rejected, and instead, adopted a more informal approach (Cushion & Nelson, 2013; Mesquita et al., 2014) situating coaches' learning within their work environment and aided by a coach developer.

4.2.2 Participants

The Head of Methodology had frequently observed seven lead academy coaches the previous season. He had identified their use of questioning (i.e., high levels of convergent questions and/or not letting players express their thoughts) as an area for improvement. Coaches seemed unaware of their questioning application but appreciated the potential benefit of reflecting about their questioning techniques. They agreed to participate in this specific work-based CDP providing signed informed consent before involvement. The under 11's coach withdrew from the study after two sessions, expressing discomfort at being recorded. The six remaining coaches remained involved throughout the whole process except the under 15's coach, who left at the end of the first season and missed the second season's interview. Pen pictures of coaches are presented in Table 1.

Table IV.1. Coaches' profiles, qualifications, and experience

Pseudonym	Pedro	Pablo	Carlos	Juan	Antonio	Daniel
Age	23	29	31	36	46	31
Age-group coached year 1	U9	U10	U12	U13	U14	U15
Age-group coached year 2	U10	U8	U15	U19	U13	Left
UEFA qualification	A	B	Pro	Pro	Pro	Pro
University education	MSc	BSc	MSc	N/A	BSc	BSc
Years playing professionally	0	0	0	15	0	0
Years coaching	6	12	8	3	20	10
Years coaching youth	6	12	7	3	13	7
Other jobs during year 1	1	0	2	0	1	1
On-going CPD	2 CPDs	0	0	0	0	0

4.2.3 Procedure

Ethical approval was received from a university ethics committee (ref: 781/CEIH/2019), and coaches were informed about the study's purpose. Data collection occurred throughout 24 months interspersed by a six-week CDP in the following order: 1) Pre-intervention systematic observations (Sep-Dec 2018); 2) Pre-intervention interviews (Jan 2019); 3) Workshop and directed task 1 (Feb 2019); 4) Directed task 2 (Feb-Mar 2019); 5) Post-intervention systematic observations (Mar-May 2019); 6) Post-intervention interviews (May 2019); and 7) Consolidation interviews (May 2020) (Table 2). Pre-intervention, post-intervention, and consolidation interviews enabled the longitudinal monitoring of any changes in coaches' perceptions on the application of questioning, whereas comparisons between pre-intervention and post-intervention systematic observation data evidenced any changes in behaviour.

Table IV.2. Data collection methods and CDP activities chronologically ordered

Phase	Method/Stage	Purpose & procedure
Pre-intervention	1) Systematic observations (Sep-Dec 2018)	-To understand coaches' utilisation of questioning before any CDP. -Two training sessions per coach video recorded with habituation purposes (Darst et al., 1989). -Four training sessions per coach video recorded through a ten in-season period. In total: Pedro 298 (M=75) minutes; Pablo 345 (M=86) minutes; Carlos 335 (M=84) minutes; Juan 297 (M=74) minutes; Antonio 283 (M=71) minutes; and Daniel 253 (M=63) minutes. -These four sessions were coded through an adapted version of the CAIS (Cushion et al., 2012a) and O'Connor et al. (2018) tool that included 8-behavioural categories linking questioning types and timings.
	2) Interviews (Jan 2019)	-To understand coaches' knowledge underpinning the use of questioning before any CDP. - One interview per coach. -Schedule deductively developed and pilot tested.
CDP	3) Workshop & directed task 1 (Feb 2019)	-To locate 'issues' within coaches' knowledge-practice (Stodter et al., 2021) so they explored links between theory and practical application (Jones et al., 2012; Stodter & Cushion, 2016). -Workshop: delivered in the training ground including ideas discussed with research team. Leaded by Academy Manager with assistance of the Head of Methodology and CD. -Directed task 1: 6 (not recorded) training sessions to enable coaches experimenting with their questioning techniques in-context.
		-To stimulate coaches' reflection on the situation in which they asked questioning types and its appropriateness.

	4) Directed task 2 (Feb-Mar 2019)	-One training session per coach video recorded every week throughout a 4-week period. -Two video sequences delivered to each coach every week and linked to reflective questions.
Post-intervention	5) Systematic observations (Mar-May 2019)	-To examine changes in the use of questioning after the CDP. -Four training sessions per coach video recorded through a ten in-season period. In total: Pedro 257 (M=64) minutes; Pablo 320 (M=80) minutes; Carlos 242 (M=81) minutes; Juan 321 (M=80); Antonio 268 (M=67) minutes; Daniel 270 (M=67) minutes. -The pre-intervention systematic observation instrument was also employed to analyse post-intervention systematic observation data. -Inter- & intra-observer reliability for frequency and duration (seconds) data with the formula agreements/(agreements + disagreements) x 100 (Darst et al., 1989).
	6) Interviews (May 2019)	-To examine coaches' knowledge development after the CDP. - One interview per coach. -Schedule deductively developed and pilot tested; but also included some questions for some individual coaches involved in specific events at their post-intervention sessions.
Consolidation	7) Interviews (May 2020)	-To examine stabilisation of coaches' knowledge and further developments after twelve months without contact with the CD. -One interview per coach. -Schedule contained post-intervention interview schedule and stimulated recall examples.

Pre- and post-intervention systematic observations

All participants' training sessions were recorded with a digital video camera (Sony HDR-CX900E, China), mounted on a tripod, and positioned to capture the practice space, the players, and the coach. Coaches wore a wireless headset microphone and radio transmitter (AKG PT40 Pro, China) that transferred their communication into a radio receiver (AKG UHF PR40, China) connected to the camera.

The Head of Methodology, CD, and the research team met to confer their views on questioning and the importance of its timing and agreed to develop an instrument with enhanced face validity regarding behaviour temporality. We followed procedures adopted elsewhere (Raya-Castellano et al., 2020), and the CD pilot coded the initial two habituation sessions of each coach (not included for analysis) to adapt previous' instruments containing training periods where players are active and inactive. Instances where questions occurred during training were discussed and classified until no discrepancies between the temporal categories and their definitions emerged during additional pilot coding.

Four 'training moments' were identified: 1) During the practice, 2) In-between practices, 3) Coach stops the practice, and 4) Ball out of play. In-between practices contained

three secondary moments (i.e., player huddle, drinking break, and transition) (Table 3). The training moments and question types were combined which resulted in an eight-category system: convergent/divergent during practice, in-between practices, when coach stops practice, and when ball is out of play. The four pre-intervention sessions for each coach were coded using this system with Sportscode© Gamebreaker (version 10).

Table IV.3. Type and timing of questions, definitions, and examples

Category	Sub-category	Definition
Type of question	Convergent	Limited number of correct answers/options – closed responses. e.g., *'Where does he wants it, to his feet or into the space?', 'Should you've pressed in this situation?', 'Who is the free man?'.*
	Divergent	Multiple responses/options – open to various responses. e.g., *'What would you do in this game scenario and why?', 'Tell me aspects for consideration when defending wide crosses?', Within this 2 vs 1 situation, what options do you have?*
Timing of question	During practice	Time of the training session when a practice is being played or the ball is rolling. Excluding when the ball is out of play.
	In-between practices	*Player huddle:* moment of a training session prior to a following practice when the coach gathers all players in a huddle for explanation/discussion within a certain area (*Adapted from* O'Connor et al., 2018).
		Drinking break: time within training prior or subsequent to a practice when players are walking on their way to hydrate, drinking or returning from drinking into a player huddle or practice positioning (*Adapted from* O´Connor et al., 2018)
		Transition: time within training prior or subsequent to a practice when players are: 1) Moving from a player huddle into practice positioning or vice versa, 2) moving from a circuit exercise to a following exercise, 3) awaiting coach indication to start the practice (Cushion et al., 2012a), 4) Told to collect the equipment.
	Coach stops practice	Instance at training in which the coach asks players to stop and: 1) Freeze in their current position (O'Connor et al., 2018), 2) come for a player huddle, 3) rearranges the structure/rules of the practice; but the same practice-format continues after the break.
	Ball out of play	Moment of a training session when the ball goes out of play (e.g., *outside, goal, offside*) or the coach acts as a referee to indicate a type of re-start. The coach can or cannot use that time to intervene/stop the practice.
	Uncodable	Any other question or training moment not fitting the previous categories.

Post-intervention systematic observation data were collected following procedures described in pre-intervention and enabled comparisons between question types at the two time points over a matched number of sessions and player groups coached.

Pre-intervention, post-intervention, and consolidation interviews

After meetings to develop the pre-intervention interview schedule and undertaking pilot testing, the interview schedules finally included: 1) biographical and demographical questions, 2) questions examining rationales for providing augmented information (i.e., instruction and feedback) or asking questions, 3) questions regarding their utilisation of coach behaviours during training with a focus on their questions and their perceived appropriate timing. Post-intervention interviews were equally prepared and explored: 1) consideration of coaches' learning throughout their careers; 2) exploring rationales and preferred instances for using different question types; 3) stimulated recall questions regarding their utilisation of questioning; and 4) their perception of the CDP process and the challenges experienced (Table 4). Pre-intervention and post-intervention interviews were conducted in a private office within the academy setting to avoid any disruptions and lasted between 24.4 and 30.7 minutes (mean = 28.2 ± 2.4), and 31.7 and 45.4 minutes (mean = 41.3 ± 5.2), respectively.

The following season, coaches were encouraged to adapt what they had learnt with their new age-groups, with no input about their use or timing of questions. Consolidation interviews were conducted via Zoom due to the covid-19 lockdown and lasted between 48.9 and 72.3 minutes (mean = 59.7 ± 8.6). The focus of consolidation interviews was to determine changes in knowledge and its stabilisation. Stimulated recall examples for each instance were prepared alongside the post-intervention interview schedule (Figure 1). The six coaches completed all interviews except Daniel who missed the consolidation interview.

Table IV.4. Pre- and post- intervention interviews' themes

Pre-intervention Interview		**Post-intervention Interview**		
Higher-order themes	**Second-order themes**	**Higher-order themes**	**Second- and first-order themes**	
0) Preferred coaching styles	-Concept -Rationale	1) Questioning rationales	-Reasons underpinning use -Questioning vs direct information	
1) Questioning rationales	-Reasons underpinning use -Questioning vs direct information	2) Adoption of question types	-Convergent & divergent questions conceptions -Combination of convergent & divergent questions	
2) Concepts of question types	-Conceptions -Dis/advantages	3) Timing & rationales of question types	Introduction	To check players' understanding of concepts already worked on
			During: Convergent	To avoid losing practice time Players have a low attention state
			In-between: Divergent	To think how performing subsequently Players are in a more reflexive state
3) Timing of question types	-During practice - Closed -In between - Open -Limited understanding of rationale		When coach stops	Because an emerging situation Giving immediate feedback or correct Flashback: link training action to match Intentionally so players can improve second bout
			Far zone intervention	To avoid stopping More individual intervention
			Ball out of play	To slow down or increase the practice's tempo Practice stops itself

First-order themes	Second-order themes
Questions not requiring players' answers	During the practice
Rhetorical or instructional questions	
Providing clear initial information	In-between practices
Progress from divergent to convergent questions	
Reinforce positive play	When coach stops practice
Correct improvable aspects	
Highlight a particular action	
Avoid frequent stops	
Alternative is approaching far zone players	
Quick ball: increase tempo or be game-specific	Ball out of play
Game stops itself: congratulate or correct	

Figure IV.1. Consolidation interviews' new emerging first-order themes

Coach Development Programme

Stage 1: Workshop and directed task 1

As the communication curriculum was on its infancy at the academy, an introduction of the CAIS' behaviours (Cushion et al., 2012a) was made. This instrument was selected as a tool for supporting the development of communication within the curriculum, because its previous utilisation to measure question types adopted by coaches (Partington, et al., 2014) and formal CDPs' impact (Stodter & Cushion, 2019).

The workshop was designed following principles of Collaborative Developmental Action Inquiry (Torbert, 2013) and aimed to expand the information on questioning upon which practitioners act (Voldby & Klein-Døssing, 2019). Coaches were enabled to share their opinions concerning the use of instruction/feedback or questioning, with coaches considering questions an effective behaviour for some situations. However, when the CD asked participants to give examples of questions they typically asked in their sessions and express their perceived player learning rationale, two main positionings emerged: 1) using as much divergent questioning as possible, and 2) divergent questions being difficult to use during training. Subsequently, individual or group questions asked by the coach were distinguished, and

classified into convergent or divergent, so coaches differentiated between questions requiring un/limited or lower/higher order thinking (Harvey & Light, 2015).

Finally, the four 'training moments' were presented, and coaches were encouraged to experiment with instances in which their question types could be employed more effectively during their own coaching sessions (Stodter & Cushion, 2016). It was intended that participants explored links between questioning theory and application (Jones et al., 2012). No suggestion of the most beneficial question type or timing was provided. Each coach was given six of their normal training sessions to self-discover how questioning could be adopted within the 'training moments' of their sessions, before beginning directed task 2.

Stage 2: Directed task 2

Coaches were emailed video-based sequences (i.e., clips) from directed task 2 recorded sessions, where they had asked questions to their players. These served as a stimulus for virtual reflective conversations (via email) with CD to be framed on coaches' observable actions (Stodter et al., 2021). Indeed, video clips were combined with a dialogic learning approach that started with a divergent question (e.g., what are your thoughts on your intervention-questions used in this clip?), and aimed to encourage coaches to develop their understanding, cognitions, and reflections about their practice (Stodter et al., 2021).

If responses contained information not understood or superficial, the CD sent coaches a second re-formulated probing question intended to promote clarification or deeper reflection (Cope et al., 2020). This typically attempted to elicit further elucidation about their previous answer (e.g., what do you mean by players' being in a non-attentional state?); refine participants' thoughts (e.g., what specifically is what you do not like from interrupting practices to ask questions); probe the effectiveness of employed approaches (e.g., how and why do you think stopping the practice and questioning contributed to your objectives?); or suggest alternative approaches and their rationale (e.g., what could you do within a future similar situation and why?).

Directed task 2 was disseminated before coaches' first training session of the week and expected to be completed before their last session. All participants answered most questions of this task, except Carlos and Daniel (Table 5). These coaches had attended the workshop and completed the directed task 1, however, when reflective questions and video-based sequences of their questioning techniques were disseminated; Carlos never responded, and Daniel only answered one bout of questions.

Table IV.5. Coaches' commitment to directed task 2

Tasks	Pedro	Pablo	Carlos	Juan	Antonio	Daniel
No. of clips & questions initially disseminated	8	8	6	8	8	6
Reflective answers	8	8	0	8	6	2
2nd questions disseminated	6	4	0	2	2	0
2nd reflective answers	6	4	0	2	0*	0

*Antonio was disseminated two 2nd questions that were not responded.

4.2.4 Data Analysis

The eight training sessions for each coach (4 pre-intervention and 4 post-intervention) were coded by the CD and exported to Microsoft Excel (version 16.48). This generated count and duration for convergent and divergent questions within each moment. With this data, the mean frequency count of question types within each moment at pre- and post-intervention phases for each coach was estimated. Standard deviations were calculated to indicate variability of mean values. Intra-observer reliability was determined by comparing the CD's codes of the same session six times and agreements between the these ranged between 90% to 95% and 86% to 89% for frequency and duration data. Inter-observer reliability was tested between CD and a trained research team member who coded the same six sessions. Agreement levels reached 90% and 87% for frequency and duration data.

Pre-, post-, and consolidation interviews were transcribed verbatim immediately after their conclusion. These data yielded 128 pages of single-line-spaced text read several times during the analysis. In-depth analysis was performed for each interview phase, independently, using a six-step thematic analysis approach (Braun et al., 2016) that categorised raw data into meaningful higher- and second-order themes (Hanton & Jones, 1999). This process commenced deductively, continued inductively (Scanlan et al., 1989), and grouped questioning concepts according to similarities and differences between coaches. Furthermore, changes in themes' meaning between interviews were compared within a bespoke matrix that included the coded categories for each coach within the three time-points. These categories were deemed modified when more frequently used or qualitatively different (Saldaña, 2003). Indeed, concepts that matched with the previous interview data were included within those themes to add further depth, whereas a new theme was created for non-aligned concepts (Reeves et al., 2018).

To enhance the data's trustworthiness, co-authors acted as critical friends in understanding and critically appraising data. Specifically, the third and last authors met with

the CD on a weekly basis throughout the analysis phase and supported the lead researchers' analysis through discussion that addressed their isolation within the process and data overload (Foulger, 2009). Although time consuming, this approach was necessary to strengthen, refine, and support the CD's analytical decisions.

4.3 Results, findings, and discussion

Convergent questions decreased from pre- to post-intervention for all coaches except Antonio. Total and divergent questioning only increased for coaches who undertook the complete work-based CDP (Table 6). Regarding convergent and divergent questions within the practice moments, pre- and post-intervention comparisons exhibited the highest increases in convergent questions during the practice and divergent questions in-between practices for this group of coaches. Smaller increases were detected for divergent questions when the coach stopped practice. Only Pablo exhibited a higher rise of divergent questions within this situation compared to in-between activities (Table 7).

Pre-, post-, and consolidation interviews suggest changes in all coaches' perceptions about the application of questioning within training sessions after the CDP. These perceptions were grouped into three main higher-order themes: 1) questioning rationales, 2) concepts/adoption of question types, and (3) timing and rationales of question types. Moreover, congruent changes between perceptions (i.e., knowledge) and behaviour only occurred for coaches who completed the full work-based CDP. To further examine this, the following sections are structured into: 1) coaches' perceptions on questioning application and 2) transference of knowledge to behaviour.

Table IV.6. Number of questions asked at pre- and post- sessions per coach

Work-based CDP	Coach	Convergent questioning		Divergent questioning		Total questioning	
		Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**
Complete	Pedro	88	72	11	76	99	148
	Pablo	46	38	25	38	71	76
	Juan	46	37	9	53	55	90
	Antonio	18	37	5	44	23	81
Incomplete	Carlos	56	31	12	5	68	36
	Daniel	30	16	20	19	50	35
Total		**284**	**231**	**82**	**235**	**366**	**466**

Table IV.7. Mean (M) frequency and standard deviation (SD) of question types within the practice-moments at pre- and post-intervention phases

		COMPLETE WORK-BASED CDP								**INCOMPLETE WORK-BASED CDP**			
		Pedro		**Pablo**		**Juan**		**Antonio**		**Carlos**		**Daniel**	
Moment	**Question**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
		M (SD)	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**
During practices	Convergent	**5.00 (3.56)**	**10.25 (5.97)**	**1.25 (0.96)**	**7.25 (1.26)**	**4.00 (2.58)**	**7.00 (2.71)**	**0.75 (0.50)**	**7.00 (2.71)**	3.75 (1.89)	3.00 (1.73)	1.25 (0.96)	1.00 (0.00)
	Divergent	0.25 (0.50)	1.25 (1.26)	0.00 (0.00)	1.75 (0.96)	0.00 (0.00)	0.00 (0.00)	0.25 (0.50)	0.00 (0.00)	0.75 (0.96)	0.00 (0.00)	0.00 (0.00)	0.50 (1.00)
In-between practices	Convergent	6.25 (5.12)	3.25 (3.86)	2.75 (3.10)	0.25 (0.50)	4.50 (2.38)	1.75 (1.26)	1.00 (1.15)	1.75 (1.26)	6.75 (4.57)	3.67 (3.51)	0.00 (0.00)	1.00 (1.41)
	Divergent	**1.25 (1.26)**	**11.25 (6.40)**	**0.25 (0.50)**	**1.75 (0.96)**	**0.75 (0.96)**	**10.75 (9.22)**	**0.25 (0.50)**	**10.75 (9.22)**	1.75 (0.50)	1.00 (1.73)	1.25 (0.96)	1.75 (1.71)
Coach stop practice	Convergent	5.5 (5.20)	3.25 (1.26)	1.50 (2.38)	1.75 (2.36)	2.50 (3.11)	0.50 (1.00)	1.75 (1.71)	0.50 (1.00)	2.50 (2.65)	2.33 (3.21)	5.00 (6.38)	1.25 (0.96)
	Divergent	**0.25 (0.50)**	**6.25 (5.91)**	**1.00 (2.00)**	**4.75 (4.35)**	**1.50 (1)**	**2.25 (2.22)**	**0.25 (0.50)**	**2.25 (2.22)**	0.25 (0.50)	0.00 (0.00)	2.75 (3.77)	1.25 (1.50)
Ball out of play	Convergent	2.25 (1.89)	1.25 (1.26)	0.00 (0.00)	0.25 (0.50)	0.50 (0.58)	0.00 (0.00)	1.00 (1.41)	0.00 (0.00)	1.00 (2.00)	1.33 (1.53)	1.25 (1.26)	0.75 (0.96)
	Divergent	0.25 (0.50)	0.25 (0.50)	0.00 (0.00)	1.25 (1.26)	0.00 (0.00)	0.25 (0.50)	0.50 (0.00)	0.25 (0.50)	0.25 (0.50)	0.67 (1.15)	1.00 (1.41)	1.25 (1.50)

4.3.1 Coaches' perceptions on questioning application

Pre-intervention interviews

When asked about their preferred behaviours to facilitate player learning, one participant mentioned 'positive feedback reinforcing player behaviours', whereas the rest indicated 'asking questions'. At pre-intervention, coaches asked 366 questions in total and affirmed using them for encouraging 'thinking', 'reflection' and 'understanding'. However, following O'Connor et al. (2021) who associated divergent questioning to game tactics, Pedro, Pablo, and Juan linked divergent and convergent questioning to in-possession and out-of-possession themes; suggesting that the former aspects require more 'creativity' and 'cognitive processing':

> *"…when pressing, the striker gets somewhere and the midfielder somewhere else. These are patterns of our game that always happen, and I direct them more…On the other hand, if the* opposition *comes to press our build-up play with one, two, or three, I want them to be able to interpret if we can play or where the space is…"* (Pedro)

Another factor that seemed to influence participants' utilisation of questions was the moment of the session in which the coach intervened. Questions asked before or after a practice are believed to have less influence on players' game sense (McNeill et al., 2008). Nonetheless, at pre-intervention, most participants asked a greater number of questions in-between practices and Juan stated that he asked questions before beginning training to check players' understanding of the session's focus and provided feedback later while players performed. Pablo, who exhibited one of the lowest rates of questioning when practice stopped at pre-intervention, further explained this indicating that although he aimed to develop active-thinking players, a balance between asking questions and practice continuity was desirable:

> *"I also think it´s very difficult delivering this type of training. You should constantly be stopping for asking questions. Thus, we try to make them reflect while ensuring practice continuity…"*

Because coaches use constant stoppages in their practices that can restrict players' problem-solving opportunities (O'Connor et al., 2017), 'to observe more' and direct less has been recommended by some researchers (Cushion, 2013, p. 66). Indeed, O'Connor et al. (2020) have proposed the notion of practice continuity, so players discover solutions by themselves, interspersed with occasional interruptions involving questions. At this stage, coaches distinguished between convergent and divergent questions (i.e., with few or multiple response options) without referring to the thinking skills each questioning type can promote.

Furthermore, demonstrating awareness of their pre-intervention quantitative data, Antonio indicated that most of his questions were convergent and directed to his expected answers. Likewise, Juan and Daniel stated that their convergent questions while players were practising aimed to avoid reducing the tempo of the activity. Only Daniel and Pedro outlined 'before the following practice' as an appropriate moment to ask more divergent questions, although justifications for this strategy were limited:

> *"…if you come out to press there, what are you generating? If you want to force the play one way, how should you press? I believe that all or most of the questions I ask are closed…and you want them to tell you what you want, but that it´s them who find the solutions".* (Antonio)

> *"During practices, more direct questions seeking quick answers. Because we don´t want to stop the tempo, dynamic…and in-between you can open a bit more the questions, so they reason a little more".* (Daniel)

Previous studies have discouraged the use of questions requiring low order knowledge (i.e., recalling or understanding) or convergent thinking (i.e., with limited response options) (Cope et al., 2016). In addition, game-based approaches have suggested that questions can be mostly asked 'between bouts of game play' (Harvey & Light, 2015, p. 178). However, these claims have been made without consideration of why these circumstances might be more appropriate, or when and why coaches perceive better opportunities for asking convergent and divergent questions to enhance players' learning. Only O'Connor et al. (2021) identified that during drill- and game-based practices, both types of questions are typically asked by freezing players into their current positions with exception of convergent questions within large-sided games. Thus, participants appeared to possess limited understanding about why certain moments might involve better opportunities for asking players different question types.

Post-intervention interviews

During the post-intervention phase, participants asked 466 questions in total. Although only coaches in the complete work-based CDP increased convergent questions during practice, all participants demonstrated awareness of this approach arguing that simpler questions enabled quicker answers and the practice to continue. Conversely, all coaches in the complete CDP increased divergent questioning in-between practice and when stopping practice at post-intervention, suggesting that players required meaningful opportunities and time to engage in higher-order thinking. This concurs with graduate coaches' perceptions of intervals between

practices constituting an opportunity for dialoguing with players (Stonebridge & Cushion, 2018). Indeed, Pablo and Juan maintained their preference for asking more divergent questions before the first activity and all coaches considered the use of divergent questioning in-between practices appropriate, due to players being in a 'more reflexive state':

> *"…when the game is happening, you can throw the divergent question but the attention during those instances can be lower due to the time. In-between practices, there is that little moment for disconnection in which they go to drink water or they´re resting".* (Carlos)

Furthermore, participants stated that they stopped practices when 'meaningful' or 'clear actions of improvement' occurred. These interruptions aimed to rearrange activities not working or 'to make immediate corrections'. Antonio and Juan perceived stopping the practice and highlighting aspects of improvement as a more suitable guided discovery strategy than overextending information before the following practice. Pablo, who had the highest increase in divergent questions when stopping compared to in-between practices, indicated he deliberately used this approach to give 'usable feedback' that players could utilise in the subsequent bout of play (Cazden, 2001). Contrary to Caram and Davis (2005), who developed learners' knowledge progressing from lower- to higher-order questions, he preferred to guide players starting with divergent questions and moving toward more convergent questions that inquired his desired responses. This approach appears to share similarities with the Initiation Response Evaluation/Feedback questioning structure (Harvey & Light, 2015) where coaches do not enable further exploration of players' ideas (Forrest, 2014); and therefore, positioning themselves as gatekeepers of knowledge (Potrac & Cassidy, 2006):

> *"When the practice is stopped. It´s immediate feedback. Something has just happened. Later, this same action must be very meaningful for him to remember…"* (Carlos)

> *"… during a 15-minute practice, stopping it in the middle and refresh the things you´ve seen or haven´t come out. So, in the last part, you see if they do it better".* (Juan)

> *"I often start more divergent and if they don´t answer well, you make them more convergent…So you can see what they think, and you then guide them towards what you want".* (Pablo)

To avoid stopping the whole group when asking small-group questions during team-based practices, Cazden (2001) proposed calling one individual from each team 'off the pitch'.

In this study, a similar approach not contemplated as a subcategory of 'during the practice' moment emerged from interview data. This commonly occurred during large games and consisted of approaching a player, not intervening immediately. O'Connor et al. (2021) reported that questions posed under these circumstances typically involved low order thinking. Participants described this as 'the opposite to interrupting practice', enabling practice continuity, and being ideal for facilitating individual corrections:

> *"That boy, as a centre back, tended to dribble and lost many balls. I used that time…it´s more individual and if it's a mistake is good because the boy does not see himself harassed in front of the group".* (Pedro)

Consolidation interviews

Post-intervention interview themes remained consistent, suggesting knowledge consolidation had occurred. Only minor changes in the meaning of some first-order themes were noted (see figure 1). For instance, although the use of 'rhetorical' questions has been discouraged for their limited value in facilitating higher-order thinking (McNeill et al., 2008), participants recognised that some of their stimulated recall questions during practice 'could have been substituted by instructions'. Similarly, they acknowledged having asked questions during practices that did not expect a player response with the primary objective of directing players to knowledge they already possessed but were not implementing:

> *"I asked that question many times* [and now what?] *so they assimilate that as soon they lose the ball, they have to press…Practically, there isn´t much difference because if I say 'press', players in the near zone have to press…"* (Juan)

> *"When I ask a question and go it´s because I consider that the player already knows the concept…We talk about convergent questions. That one is super mega convergent".* (Antonio)

Pablo and Antonio expressed that a divergent question could lose divergence (i.e., response options) and become more convergent if about previously explained concepts. Pablo stated that after time working with the same age-group, 'when you ask a question, you know what the boy is going to answer, and he knows what you want him to answer'. This process has been described as players engaging in a 'guessing game' of what their coach is thinking (Myhill & Dunkin, 2005); and suggests that player's existing knowledge might decrease the complexity of a divergent question because similarities between current and previous contents asked. Therefore, albeit players' perceptions were not examined, it appears that question types

might limit or expand the possible response options or encourage higher or lower thinking skills depending on the recipients' (i.e., players) levels of understanding.

Further, all coaches became more conscious about stoppages reducing practice continuity and proposed clear initial information to avoid later interruptions. Nonetheless, coaches have been observed stopping practice and directing considerable tactical divergent questions to a player or small group while the rest were waiting (O'Connor et al., 2021). Antonio rationalised that some situations require stopping and asking individual or small-group questions, so all players become aware of certain information. Indeed, stepping into the practice to make individual corrections was the favoured approach of participants unless the player's mistake was relevant to the whole group, or a player required bandwidth feedback (Williams & Hodges, 2005):

> *"If the defensive midfielder wanted to get forward, he could do it. But if our fullback were also high, they would leave space in behind…I stopped and asked because I didn´t want that this action occurred under any circumstances, and they all needed to be aware".* (Pedro)

Finally, participants increased their understanding of how to use ball out of play time. Most coaches expressed they could 'kick a ball in' to maintain continuity or delay the restart to 'congratulate or correct' a recent action. Pablo noted the benefit of this approach:

> *"…The practice has stopped itself, and we're gonna give quick instructions to continue. Players feel you haven´t stopped it. The play has stopped itself, and we have talked".*

O'Connor's et al. (2021) data, provide some evidence about the timing in which coaches ask questions during training. The previous findings advance our understanding about what coaches perceive to be more appropriate opportunities for asking convergent or divergent questions. Specifically, coaches expressed their preference for asking convergent questions during the practice delivery, and divergent questions during stoppages of play because of a higher time to engage players in higher-order thinking. Moreover, although coaches were aware of the benefit that stopping practice and asking questions could entail, they contemplated approaching individuals not immediately intervening in the practice to avoid frequent or group interruptions. In addition, this CDP leaded to changes in coaches' perceptions (i.e., knowledge) about their sense of use and timing of questioning techniques. In combination, the workshop and the experimentation and reflection tasks resulted in all participants' increased

understanding, albeit the research design employed could not guarantee exclusive causal effects between the work-based CDP and coaches' knowledge outcomes.

4.3.2 Transference of knowledge to behaviour

Although all participants appeared to develop their knowledge about the use of question types within the various moments of practice, only coaches who undertook the complete CPD transferred it into behaviour changes at post-intervention. These changes involved increased convergent questions (during practice) and divergent questions (in-between and when the coach stops practice); and constitute initial evidence of knowledge transfer to behaviour. Conversely, coaches who did not undertake video-based reflections presented inconsistent knowledge and behaviours (see table 7). Therefore, it is argued that congruence between knowledge and behaviour might specifically relate to participants' engagement in directed task 2.

As coaches' knowledge can become tacit/unconscious over time (Watts & Cushion, 2016; Cushion, 2016), it has been suggested that expert coaches utilise their cognitive structures despite not necessarily being able to articulate their knowledge declaratively (Nash & Collins, 2006). Indeed, empowering coaches to critically reflect and compare the alignment between their ideas of practice, and their observable actions and underpinning knowledge (Putnam, 2014) has been recommended for increasing coaches' knowledge consciousness (Cushion, 2016). Further, Jones et al. (2012) reported enhanced knowledge and 'philosophy' of practice when coaches engaged in group reflection about the application of theory while being given opportunities to implement knowledge in-context. Thus, setting unresolved issues in coaches' knowledge-practice, and facilitating awareness of the employed behaviours and reflection about their suitability (Jones et al., 2012), might lead to behaviour acceptance or willingness to change (Raya-Castellano et al., 2021).

In this study, whilst the interviews did not specifically explore why changes in convergent and divergent questions occurred, coaches in the complete work-based CDP displayed their satisfaction with the balanced positionality that the CD had adopted. Supporting findings from Stodter et al. (2021), participants provided considerable value to the reflective process that combined video-based and dialogic reflections. They suggested that the CD's questions asked in combination with reviewing their own videos had enabled them 'to think about the situations surrounding their questions in more depth' while 'identifying good and improvable aspects' of their delivery. In fact, two coaches recalled training situations in which

they had noticed employing questioning approaches that contradicted their plans generated during directed task 2. For example:

Antonio: "*…before I was unable to talk to a player while the practice was going on. Now, I see it appropriate because I am giving the information required and I haven´t stopped the practice.*

CD: *What do you think of the questions you've asked?*

Antonio: *…the problem is that I've answered the second question myself. I'm comfortable with the first one but I've self-answered the second one.*

CD: *Is there anything wrong with that?*

Antonio: *Well. I know where he's made the mistake. It's him who must think about where he is wrong and why. Thus, it's better if it's him who answers the question…Actually, I remember being in that situation thinking 'why have you just done it again' [self-answering a question for the player]?"*

Behavioural 'discoveries' or 'disturbances' contradicting coaches' intentions have been highlighted as potential opportunities for changing coaching practice (Voldby & Klein-Døssing, 2019). This extract from Antonio's post-intervention interview not only reflects increased awareness of a past 'discovery', but also intention of not self-answering his questions. Although the above situation represents an example of unconscious processes still guiding coaching action, this also involved real-time consciousness of a contradictory behaviour. It is suggested that the concept of 'not self-answering questions' matched Antonio's cognitive structures during directed task 2 and had become more available for its application (Stodter & Cushion, 2017), constituting an initial stimulus for behaviour change.

For coaches implementing conscious knowledge about the application of questioning within the practice moments, reflection increasing the availability of coaches' conscious knowledge and intentions might not suffice. Because coaches have been shown to reflect through a sequence of strategy generation, experimentation, and evaluation of their coaching approaches (Gilbert & Trudel, 2001), reflective practice might have to be combined with several opportunities to implement and adjust knowledge about the application of questioning in-context. Stodter and Cushion (2017) refer to this process as the reflective feedback loop cycle, where continuous experimentation, adaptation, and refinement of behaviours occur until effective adoption of knowledge into practice. Therefore, it is argued that the video-based and dialogic reflective practice concerning the use of questioning, integrated within coaches' training sessions, might have resulted in congruent changes between questioning-related knowledge and behaviour exclusively for the complete work-based CPD.

Finally, coaches in the incomplete CDP group (i.e., Carlos and Daniel) highlighted other contextual or organisational factors that hindered their involvement in this work-based CDP. As the rest, they worked for the club part-time and undertook coaching in the evenings alongside other jobs. Both attributed not being able to dedicate more time to the directed video-based reflections due to their other jobs. Moreover, Daniel, whose under 15 players competed in an under 16-league, was struggling against relegation. This could result in the academy losing this age-group's category status and potential difficulties for recruiting under 15 players the following season:

> *"If you are more hours in the club, the salary will increase at the end of the month and it wouldn´t be necessary to be multi-employed".* (Carlos)

> *"I have been myself with these circumstances. It´s true that the needs of competition have slowed down the learning processes. This is the last year of development. However, due to the urgencies, this year has transformed into a year of competition and the learning process has slowed down quite a lot".* (Daniel)

4.4 Limitations and future research

Although this work-based CDP included incomplete and complete interventions, the absence of a group receiving no education did not guarantee a causal relationship between the CDP activities and coaches' outcomes. Second, coaches were free to participate and engage in this CDP; but the topic (i.e., questioning) and the four 'training moments' framework were decided by the Academy Management and research teams, which might have influenced coaches' commitment (Cope et al., 2020). Furthermore, whilst participants were interviewed about their perceptions on how the video-based and dialogic reflection had supported them, the specific reasons of coaches in the complete CDP for changing their questioning utilisation were not explored. Therefore, future studies could include appropriate study designs to measure the extent to which video-based and dialogic reflection, and self-discovery activities might lead to associated changes in knowledge and behaviour.

4.5 Conclusion

This six-week work-based CDP consisted of a workshop and two directed tasks that required coaches to experiment and reflect on their questioning techniques during training. All coaches developed and consolidated their knowledge; though only those that completed all CDP tasks transferred their knowledge into congruent convergent questions (during practice) and divergent questions (in-between practices and when the coach stops practice). It is believed

that reflection, supported by video-feedback and reflective conversations (i.e., directed task 2), apart from enhancing coaches' developmental experience (Stodter et al., 2021), might have originated changes in coaches' use of questioning when combined to the experimentation opportunities provided. The argument is that while reflection might have brought coaches' knowledge about questioning techniques to a conscious level, for adopting knowledge, several opportunities of adapting knowledge might also be required. Therefore, an appropriate integration of both tasks could be an effective approach for attaining coaches' transformation of their knowledge into congruent behaviours.

Throughout the CDP, the knowledge developed by coaches provides some practical considerations underpinning their use of convergent and divergent questioning. These are intended to describe participants' rationales for using question types within the moments of training rather than providing one-size-fits-all prescriptions of their use. First, although previous research has advocated the use of divergent questions for facilitating players' learning (Harvey & Light, 2015); as the CDP progressed, coaches considered convergent questions during the practice to enable thinking and practice continuity. Similarly, all participants suggested that for divergent questions to be effective, more appropriate circumstances are typically found when the practice is not being played. They ascribed this to the players' attentional state and time for thinking and answering. Furthermore, the use of stoppages involving questions was linked to enable players utilising knowledge discussed in the subsequent bout of practice. However, to avoid constant or whole group stoppages correcting individual aspects, coaches contemplated approaching individual players that did not require immediate involvement in the game while the practice continued.

To conclude, the multiple methods employed enabled a longitudinal supervision of coaches' knowledge and behaviour throughout the work-based CDP. Qualitative data served to understand participants' perceived opportunities for using question types during training sessions while monitoring changes in their knowledge over the 24 months. Findings highlight the importance of integrating reflection on personal coaching approaches combined with their experimentation. The integration of these activities seems relevant for attaining congruent changes between coaches' knowledge and behaviour during work-based CDPs.

GENERAL DISCUSSION, LIMITATIONS, & FUTURE DIRECTIONS

Chapter 1: Analysing coaches' behaviours within various coaching environments

The first overall aim of this Doctoral Thesis was to enhance understanding of the behaviours employed by youth football coaches within various coaching environments and their underpinning cognitive processes. To achieve this aim, a mixed-method approach was employed. Aim 1 was attained through completion of studies I, II, III, and IV (Chapters 1 and 2):

GENERAL DISCUSSION

Despite the Coach Analysis and Intervention System (CAIS) being a multidimensional tool sensitive to measure coach behaviours within various 'on-field' and 'off-field' coaching environments (Cushion et al., 2012a), the behaviours employed by youth coaches have predominantly been assessed during training and, to a lesser extent, during competition (Cope et al., 2017; 2022). Indeed, studies I, II, III, and IV extend our understanding of coaches' behaviours and/or their cognitive processes for delivering in-week training or video-based feedback sessions and matchday half-time team talks. For example, participants (i.e., coaches) taking part in studies I, II, and III utilised a prescriptive approach to coaching, with instruction (24-46 %) and feedback (23-53 %) being central to coaches' delivery approach. Data paralleled findings from previous observational studies conducted in 'on-field' coaching environments (e.g., Partington & Cushion, 2012; Partington et al., 2014) and demonstrated that similar patterns of coach behaviour are exhibited within 'off-field' environments such as video-based feedback sessions and half-time talks.

More recently, coaches with personal philosophies and specific educational backgrounds have moved beyond less prescriptive coaching approaches (Vinson et al., 2016; Agustí et al., 2020; Stonebridge & Cushion, 2018), characterised by lower instruction and increased player participation. For example, coaches with 'player-centred' philosophies have exhibited minimal instruction (2.04 %) and considerable questioning (18.89 %) (Vinson et al., 2016). Similarly, coaches with sport-related university education have been shown to employ less instruction (12.1 %) and more balanced convergent (8.98 %) and divergent (6.44 %) questions compared to non-university education coaches (instruction: 14.1 %, convergent questioning: 9.32 %, divergent questioning: 1.84 %) (Stonebridge & Cushion, 2018). However, over the four, five, and two participants taking part in studies I, II, and III, respectively, only a few presented lesser instruction and higher values of divergent questioning and player participation compared to previous works.

For example, in study I (video-based feedback sessions), all coaches included higher 'convergent' (2.17-7.10 %) than 'divergent' (1.90-6.02%) questions and Kieran exhibited the highest percentage of player participation (20.17 %). Likewise, study II (half-time talks) recorded a predominance of 'instruction' (29.90-45.58 %) for all coaches except Jacinto (U10's), whose most employed behaviour was 'in-talk player participation' (27.17 %). Moreover, study III (post-match video-based feedback sessions) insinuated that higher player participation for Pedro (19.9 %) compared to Juan (5.9 %) could be due to a slightly greater frequency of divergent questions than convergent. Whilst the study designs do not allow causal inferences to be made, it is suggested that higher participatory values for Pedro (U9's), Jacinto (U10's), and slightly higher for Amador (U13's) might be related to a greater or balanced number of divergent (Pedro: 15; Jacinto: 8; Amador: 5.25) and convergent (Pedro: 13; Jacinto: 5; Amador: 6.25) questions asked. Thereby, it might be argued that age-group coached might be another factor promoting the use of less prescriptive approaches because coaches might perceive their role to be more supportive (van Rossum, 2001) for developing players' knowledge and, therefore, they encouraged longer player participation.

The use of questioning and player participation has been deemed relevant in coaching because more prescriptive approaches (i.e., instruction and feedback) can be detrimental for skill acquisition (Williams & Hodges, 2005). Moreover, these behaviours are believed to facilitate learners' cognitive engagement and interaction with peers, which have been emphasised as key elements for learning (Cope et al., 2016; Light & Clarke, 2021). Study IV also suggests that the use of more complex divergent questions during training sessions is reliant on the surrounding situation. Indeed, coaches generally perceived a better opportunity for asking more divergent questions when training practices were not in play (i.e., in-between practices or when the coach stopped practices). Nonetheless, coach behaviour research has assumed that questioning is invariably a more effective behaviour than instruction for facilitating learning (e.g., Partington & Cushion, 2013) but no experimental research including the appropriate design has reached conclusive evidence on this claim.

To this respect, Mayer (2004) suggests that learning can occur when learners integrate new information within their previous knowledge structures. In addition, it has been argued that direct instruction might also promote discovery and active learning when structured appropriately (Cope & Cushion, 2020). For example, Smeeton's et al. (2005) demonstrated that participants receiving a 4-week guided discovery laboratory intervention including sporadic instructional cues that exclusively focussed on key postural aspects showed greater improvement in tennis players anticipations skills when compared to the explicit instruction

group (i.e., prescriptive information) or the self-discovery group (i.e., no instruction). It was concluded that participants in the guided discovery condition achieved shorter decision times and more accurate responses due to augmented cues directing subjects (at initial stages of learning) to solutions about specific aspects of performance. Therefore, it is suggested that the same might be applicable to learning more effectively other sport-specific skills, albeit there is no evidence supporting this claim and learners' skill level might be a critical variable to control.

LIMITATIONS & FUTURE DIRECTIONS

This chapter has increased our understanding of '*what'* behaviours coaches use within different coaching environments, however, it has neglected '*the how'* (i.e., style or inferred psychological implications) of their verbal strategies (Smith et al., 2015; Erickson & Côte, 2015). For example, instruments such as the Multidimensional Motivational Climate Observation system (MMCOS; Smith et al., 2015), the Coach Interpersonal Style Observational System (CISOS; Pulido et al., 2019), and the Assessment of Coaching Tone (ACT; Erickson & Côte, 2015) have been validated for assessing the interpersonal style and tone employed by coaches. Thus, utilising these tools in combination with the Coach Analysis and Intervention System (CAIS; Cushion et al., 2012a) could provide more depth about behaviour execution and the potential expected consequences on athletes.

Currently, there is some evidence of the behaviours that coaches use during training (Ford et al., 2010), competition (e.g., Partington & Cushion, 2012), video-based feedback sessions (e.g., Raya-Castellano et al., 2020), or half-time (e.g., Raya-Castellano et al., 2022b) separately. However, Cushion et al. (2012b) argues that there seems to be a tendency to examine coaching within isolated environments (e.g., training or competition) rather than considering 'on-field' and 'off-field' episodes holistically throughout the week. Thus, observational studies of coaching behaviours could examine the differences in behaviour patterns of a same coach across different environments with the same athletes. Although extremely time-consuming, this can facilitate capturing a complete picture of each coach's working reality.

Coaching science's focus on coaches is plausible with the above mixed-method research having examined coaches' cognitive processes underpinning behaviour and provided general recommendations for coaches with potential expected athletes' outcomes (Cope et al., 2022). Nonetheless, coaching research has been criticised for their findings not being directly transferable to coaching practice (Lyle, 2018). For this to occur, we argue that coaching

scientists might need to shift the focus from the coach to the athlete for understanding athletes' perceptions of their coaches and the direct effects that specific coaches' strategies might have on players. With this purpose, conducting qualitative and/or (quasi)experimental research with athletes being the scope of study is becoming increasingly necessary.

For example, qualitative studies assessing players' perceptions of coaches' can shed light on how athletes interpret their coaches' interventions (e.g., Breakey et al., 2009; Zach et al., 2022). There can also be a benefit in measuring athletes' retention of coaches' messages during talks or sessions (e.g., Mesquita et al., 2008; Mason et al., 2020). However, if attempting to produce more transferable research to coaching practice (Lyle, 2018), there is a need to conduct studies that establish cause-effect relationships between specific coach behaviours (e.g., instruction and questioning) and player outcomes attained (e.g., performance, motivation). For instance, García-González et al. (2013) in their (quasi)experimental study with youth tennis players demonstrated enhanced game knowledge and in-game decision making when a review of post-match video-based sequences was guided by a coach's individual open questioning. These studies have not been the norm and, when conducted, they typically included small sample sizes (e.g., García-González et al., 2013) with limited power to detect the effects of the interventions or active control groups receiving combined treatments (e.g., Práxedes et al., 2016).

Considering the complexity underpinning the design and delivery of studies with reliable experimental designs (Bergmann et al., 2020), it is not the objective to scrutinise previous interventions but rather to call for high-quality cause-effect studies that increase our understanding of coaches' behaviours effects. Therefore, it is suggested that conducting interventions that assess the effects of specific coaching behaviours on players and discussing findings in combination with mixed-method studies is required. Not only for increasing the transference of research to coaching practice but also in an attempt that coach education courses including coach-player communication contents is based on more conclusive evidence about coach behaviour effectiveness.

Chapter 2: Developing coaches' knowledge underpinning behaviour utilisation and affecting the knowledge-behaviour transfer

The second overall aim of this Doctoral Thesis was to expand knowledge about the coach development activities that are effective for facilitating changes in coaches' knowledge and behaviours. To achieve this aim, a mixed-method approach was employed. Aim 2 was fulfilled through studies III and IV (Chapter 2):

GENERAL DISCUSSION

Studies III and IV expanded our understanding of the rationales underpinning certain coach development activities and the potential impact that these can have on coaches. In both studies, coaches were engaged in similar coach development tasks that involved participating in a workshop about pedagogy, experimenting with ideas about behaviours within their working contexts (i.e., post-match video-based sessions and training), and reflecting upon their own practice. Indeed, both work-based CDPs resulted in positive outcomes (i.e., behaviour change and/or knowledge development).

Studies III and IV involved youth coaches in a longitudinal process intended to develop their knowledge underpinning behaviour during post-match video feedback sessions (study III) and questioning during training sessions (study IV). Three data collection points (i.e., pre-, post-intervention, and consolidation) were situated before and after the CDP took place. Whilst study III only involved pre-intervention systematic observations, study IV entailed pre- and post-systematic observations. In both investigations, coaches' knowledge and understanding were recorded initially during a pre-intervention interview and compared with two further interviews (i.e., post-intervention and consolidation) that were conducted after the CDP and separated by eleven or twelve months. Furthermore, study III's CDP consisted of: (1) a workshop about the learning implications of different coach behaviours; (2) a directed task requiring coaches to apply and experiment with new knowledge; and (3) a final reflective task using pre-intervention observational data as a stimulus for dialogic discussion. Study IV followed the same 3-stage CDP process during a 24-month timeframe, but the final reflective task was prompted through videos of coaches' in-training questions and weekly online conversations between a coach developer and the coach throughout 4 weeks.

Regarding knowledge development, data showed that, between the three interview-points, coaches' knowledge about the utilisation of their behaviours during: (1) post-match video sessions (study III); and (2) in-training questioning (study IV) increased and stabilised. In study III, disseminating pre-intervention systematic observation data of the coaches' own behaviours and reflection increased participants' understanding about the application and

integration of silence, questioning, player participation, re-questioning, reinforcement, and feedback during specific video-based game sequences. In addition, this process did also reinforce coaches' delivery approach or encouraged their desire to change. This concurs with Jones et al. (2012), whose formal CDP involving peer reflection and in-context experimentation, resulted in coaches' enhanced philosophy of practice. These beliefs and ideas about practice (i.e., espoused theories) have been shown to be composed by intentions and plans grounded on observable coaching action and its underpinning reasonings (i.e., enacted theories) (Putnam, 2014; Voldby & Klein-Døssing, 2019). Thus, it is argued that reflection and experimentation tasks (Raya-Castellano et al., 2021; Jones et al., 2012) guided by dialogic coach developers intending to co-construct knowledge (Cope et al., 2022) led participants to define their plans and intentions which can constitute an initial stimulus for changing behaviours.

A subsequent objective for study IV was to determine the degree to which experimentation and reflection tasks were effective for coaches translating their understanding about questioning (i.e., intentions and plans) into associated questioning behaviours (i.e., action). Over the six participants, two of them only engaged in six experimentation training sessions regarding their use of convergent and divergent questions within the practice moments (i.e., during practice, in-between practices, when coach stops practice, and when ball goes out of play). The remaining four coaches did also involve in six experimentation sessions, but they were engaged in another eight video-based and dialogic reflective sessions that were assisted by a coach developer. Interestingly, whilst both groups of participants generally described better opportunities for convergent questions during practice and divergent questions in-between practice or when the coach stops practice, only the latter's group translated their knowledge and understanding into a congruent behavioural application.

These findings suggests that the video-based and dialogic reflective task and full engagement in the other work-based coach development activities (i.e., workshop and experimentation) were effective in allowing the four coaches to transfer knowledge into associated behaviours. It is argued that coaches who observed themselves and hold conversations with the coach developer about their questioning techniques increased the consciousness and availability of their knowledge underpinning questioning utilisation (Stodter & Cushion, 2017). However, reflective practice itself might not suffice and, thus, continuous opportunities and/or willing to implement knowledge can be critical for effectively adopting knowledge. Because individuals are believed to learn when existing knowledge and new information (i.e., CDP contents) are integrated (Mayer, 2004) and coaches have been suggested

to continually adapt and refine their behaviours (Stodter & Cushion, 2017), it is suggested that experimentation tasks might facilitate this process. Therefore, it is concluded that combining both reflection and experimentation tasks can increase the consciousness and availability of coaches' knowledge about behaviour while facilitating its integration with new CDP content, thus, leading to congruent knowledge-behaviour adoption.

LIMITATIONS & FUTURE DIRECTIONS

The above studies (III and IV) have contributed to explain some potential rationales underlying experimentation and reflection tasks for enhancing coaches' knowledge and/or its transference to congruent behaviours. However, as all participants (i.e., coaches) taking part in these studies engaged in any of the work-based CDP tasks, it is not accurately known the degree to which knowledge acquisition and changes in behaviour were related to the reflection task, the experimentation task, or both tasks in combination. For example, considering the findings of study IV, it might be suggested that successfully affecting coaches' behaviours requires both reflection and experimentation tasks in combination, whereas the experimentation task could not be as relevant when exclusively intending to enhance knowledge. Additionally, it is also suggested that for changing coaching practice, the ability of coaches to reflect (e.g., Cushion, 2016; Cope et al., 2022), the source of reflection (e.g., video, or quantitative data), and the willing or perceived opportunity to experiment with knowledge in real sessions (Stodter & Cushion, 2016) are critical. Hence, future research including (quasi)experimental designs could ascertain these assumptions and assess in more detail the reasons why different task conditions during formal and/or work-based CDPs might lead to greater impact on coaches' development and learning.

Studies III and IV engaged participants in reflection tasks with the purpose of increasing coaches' knowledge consciousness and availability. Indeed, baseline systematic observation data and footage of coaches' own sessions (i.e., stimulated recall technique) were employed as a stimulus to promote reflection. Both tools have previously been acknowledged to lead to potential beneficial outcomes for coaches (e.g., Raya-Castellano et al., 2021; Stodter et al., 2021). Nevertheless, it has been claimed that research procedures such as systematic observation (Cope et al., 2022) or stimulated recall interview technique (Stodter et al., 2021) might need to be revisited for coach development purposes. In the view of Cope et al. (2022), these tools, when adapted to coach development, should be considered eluding a 'performative

culture' or the researcher being positioned as a 'collector-of-data' and promote greater collaboration between coaches and researchers.

To this respect, Stodter et al. (2021) highlighted that this process requires not only skill of the coach developer but also developing trust and respect with coaches. Similarly, coaches have expressed that, constructs related to self-determination theory (SDT) such as freedom to learn (i.e., autonomy-support) and feeling cared (i.e., social relationship-support), are relevant aspects of coach development environments. However, although theories of behaviour change can lead to findings about *why, when, and how* a behaviour can occur, to date, CDP research underpinned by theoretical frameworks has been scarce (Allan et al., 2018). Therefore, it is suggested that exploration of coaches' perceptions about coach developers' interpersonal style (i.e., autonomy, competence, and social relationships) and potential associated outcomes might lead to further insights regarding the coach developer positioning and coach-coach developer relationship.

SPECIFIC CONCLUSIONS & PRACTICAL IMPLICATIONS

Chapter 1: Analysing coaches' behaviours within various coaching environments

- **Specific aim 1: To appraise youth coaches' behaviours and their underpinning cognitive processes during video-based feedback sessions (Study I).**

Feedback was the most employed behaviour among all coaches, with only one coach (i.e., Kieran) allowing players to verbalise their thoughts or interact with others (i.e., player participation) for longer than a 20 % of the session's total time. In addition, coaches exhibited three forms of 'epistemological gap' or cognitive dissonance in which knowledge underpinning behaviour was either flawed or contradicted their actions.

Practical implications:

- A balance between positive and negative game sequences combined with opportunities for players thinking, answering, and discussing are relevant aspects to be included during video sessions.
- Considering coaches' understanding about behaviour utilisation with actual in-practice behaviour might be required for aligning their intentions and actions.

- **Specific aim 2: To critically examine youth coaches' behaviours and underlying perceptions during their half-time talks (Study II).**

Coaches' most utilised behaviours were 'instruction' and 'feedback'. Instruction levels excluding Jacinto ranged between 30 % and 46 %, and only two coaches (i.e., Jacinto and Damián) balanced their positive and negative/corrective feedback frequency ratios (Jacinto: 2.75 and 2.75; Damián: 10 and 8.50). Whilst all coaches affirmed starting the talk with one or various questions to understand players' game perceptions and emotions, only one coach (i.e., Jacinto) decreased instruction and feedback and, instead, increased questioning and in-talk player participation. Player participation values seemed to be higher for this coach and another (i.e., Amador), potentially due to the frequency of divergent questioning being slightly higher or balanced with respect to convergent questioning.

Furthermore, coaches affirmed that before their half-time talk, they spent some time on the field with their staff, analysing first half performance and planning the second half objectives while players returned to the dressing room. During this time, players were observed inside the changing room, exchanging varying levels of information between themselves (i.e., pre-talk player participation) but these percentages were reduced for a lead coach (i.e., Rafael: 5.46 %) that entered the dressing room earlier than the younger age-group coaches.

Practical implications:

- Dedicating enough time to confer views with supporting staff before entering the dressing room at half-time can serve to review accurately the first half events, remove some emotion from the lead coach, prepare a more objective talk, and enable players to rest and be actively involved in preparation for the second half.
- The initial questioning introduction could be enhanced by setting pre-talk player participation routines that maximised player-led discussions and facilitated knowledge development.
- The overall instruction levels provided and, in some cases, unbalanced positive and negative/corrective feedback ratios could be reduced and coaches could consider combining these behaviours with more eloquent vocal factors (i.e., volumes and tones) and non-verbal emotional expressions for delivering messages that are perceived more meaningfully by players.

- **Specific aim 3: To consider youth coaches' knowledge about behaviour utilisation during post-match video-based feedback sessions (Study III).**

Feedback was the most frequently utilised behaviour. One participant reduced his total percentage time spent in feedback to 22.6 % and increased player participation up to 19.9 %, whereas the other participant provided 53.2 % of feedback and his players participated for 5.4 % of the session. These higher and lower values of player participation appear to be related to a higher frequency of divergent questions asked to players compared to convergent. Moreover, participants suggested that silence, questioning, player participation, re-questioning, reinforcement, and feedback can be structured in a way that enable the coach to promote player thinking and interactions but also transmitting their own positive, negative, or corrective interpretations of past game sequences.

Practical implications: If intending to create an active environment during post-match video-based feedback sessions, behaviours can be sequenced in the following order:

- Silence: enabling players to observe the video clip carefully.
- Questioning and player participation: facilitating players to think about an aspect of the video clip or discuss with peers or the coach.
- Reinforcement: showing agreement or disagreement with players' responses.
- Re-questioning: redirecting players to specific aspects of the video clip and/or the desired response.

- Feedback: providing supportive or unsupportive messages about players' performance during a video clip or directing them to future potential solutions of game situations.

- **Specific aim 4: To assess youth coaches' understanding about the instances during training sessions perceived as better opportunities for asking questions (Study IV)**

After the CDP, the most considerable increases of questioning for all participants occurred for convergent questions during practice, and divergent questions in-between practice or when the coach stopped practice. Coaches suggested that easier questions could be introduced during practice that, at times, could not require a response; whereas for more complex questions to be asked the practice should not be in play. Indeed, three coaches (i.e., Pablo, Juan, and Antonio) demonstrated preference for asking questions when stopping practice with the purpose of discussions becoming 'usable' during the following bout of play. To avoid frequent stoppages and enable practice continuity, participants considered approaching and asking questions to individual players not intervening immediately in the practice.

Practical implication:

- Convergent questions might be more easily asked during the practice due to these questions requiring lower order thinking and enabling practice to continue.
- There might be better opportunity to ask more divergent questions when the practice is not being played (i.e., in-between practices or when the coach stops practice) because a longer time for players to engage in higher order thinking and discussions with peers.
- To facilitate practice continuity, approaching and asking questions to individuals not intervening immediately in the practice can be an alternative to stopping a full group for considering an individual or small group issue.

Chapter 2: Developing coaches' knowledge underpinning behaviour utilisation and affecting the knowledge-behaviour transfer

- **Specific aim 5: To understand the impact that reflective and experimentation tasks can have on coaches' knowledge about their practice over time (Study III)**

This longitudinal 3-stage work-based CDP process involving a workshop, experimentation sessions, and dialogic reflection on own systematic observation data resulted in coaches' developing their knowledge and understanding about how to use and integrate behaviours during post-match video-based feedback sessions. In addition, this process did either reinforced coaches' delivery approach or encouraged desires to change their practice.

Practical implications:

- A workshop presenting insights about pedagogy in combination with opportunities to implement this information in-context and reflection on own behavioural data can facilitate increased understanding about behaviour application; and reinforce previous deliveries or encourage change.

- **Specific aim 6: To expand knowledge about the impact that reflection and/or experimentation tasks can have over time on coaches' translation of knowledge about questioning timing into a congruent application (Study IV).**

This longitudinal 3-stage work-based CDP process involved coaches in a workshop, experimentation sessions, and dialogic video-based reflection on selected videos of own questioning techniques employed during training sessions. This process led four coaches, who completed the full CDP process, to align their understanding of predominantly using convergent questions during practice and divergent questions when the practice was not in play with a congruent application of questioning. Conversely, coaches who did only participate in the workshop and experimentation sessions did not translate their enhanced knowledge into in-practice questioning behaviours.

Practical implications:

- A workshop presenting pedagogy principles and discussing with coaches about their questioning techniques, in addition to experimentation sessions and video-based reflection can be a more effective method to bridge the gap between coaches' knowledge and behaviour compared to a CDP solely comprising the workshop and experimentation sessions.

GENERAL CONCLUSION

This Doctoral Thesis has advanced the fields of coach behaviour and coach development. First, it facilitated understanding of the behavioural activity employed by coaches during video sessions, half-time talks, or training in addition to their underpinning cognitive processes. In studies I, II, and III, most coaches exhibited large volumes instruction and/or feedback, with exception of selected participants who increased their frequency of divergent questioning and enabled players to talk for longer times within these contexts. These similarities and differences on behaviour can be attributable to coaches' individual beliefs, phases of development coached, contextual constraints, or misaligned knowledge and behaviour.

Second, a CDP comprising multiple teaching and learning mechanisms can be effective for developing coaches' understanding, reinforcing their delivery approach, encouraging changes in their intentions, and/or facilitating knowledge-behaviour translation. Specifically, it is suggested that a workshop about pedagogy and in-practice experimentation with this knowledge can result in enhanced understanding, but these activities might need to be integrated with reflective practice for effectively transferring knowledge into congruent behaviour adoption. Therefore, baseline and follow up systematic observations and stimulated recall interviews can aid to identify coaches' learning needs or to monitor knowledge and behaviour progress, and a work-based CDP comprised by experimentation and reflection tasks can facilitate knowledge development and associated changes in behaviour.

CONCLUSIÓN GENERAL

Esta Tesis Doctoral contribuye a mejorar nuestra comprensión sobre el comportamiento del entrenador y la formación de entrenadores. En primer lugar, ha facilitado la actividad comportamental de entrenadores de fútbol base durante sesiones de vídeo, charlas de descanso, y entrenamientos, así como sus procesos cognitivos. En los estudios I, II, y III, la mayoría de los entrenadores utilizaron grandes cantidades de instrucción y feedback, exceptuando algunos que aumentaron su frecuencia de cuestionamiento divergente y permitieron hablar a los jugadores durante más tiempo dentro de estos contextos. Estas similitudes y diferencias en el comportamiento se pueden atribuir a las creencias individuales de los entrenadores, las fases de desarrollo en las que trabajan, limitaciones contextuales, o conocimientos y comportamientos desalineados.

En segundo lugar, un Programa de Formación de Entrenadores (PFEs) que incluya mecanismos de enseñanza-aprendizaje múltiples puede ser eficaz para desarrollar la comprensión de los entrenadores, reforzar su manera de comunicar, fomentar cambios en sus intenciones, y facilitar que el conocimiento adquirido tenga una repercusión práctica. En concreto, tanto una charla sobre pedagogía como experimentación práctica con estos conocimientos pueden facilitar mayor comprensión del entrenador. No obstante, estas actividades deben ser integradas con práctica reflexiva para poder transferir eficazmente los conocimientos y adoptar comportamientos relacionados. Por lo tanto, observaciones sistemáticas y entrevistas con técnica de recuerdo estimulado pueden ayudar a identificar las necesidades de aprendizaje del entrenador y monitorizar sus conocimientos y comportamientos. Además, un PFEs dentro de un contexto de trabajo que utilice tareas de experimentación y reflexión puede facilitar adquisición de conocimientos y aplicación de conductas congruentes.

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ANNEXES

1. STUDY I INTERVIEW GUIDE

A. Introduction

General explanations about this interview process (aims, structure, expected timing and confidentiality).

B. Coach background, demographics, and general thoughts

1. Process prior to become a coach.
2. Qualifications that completed before appointment for actual role.
3. Explanation of how these courses prepared to deliver video sessions.
4. Type of player/person intended to develop.
5. Preferred or adequate length of video sessions and underlying rationales.

C. Learning outcomes of video-feedback sessions

1. General aim of delivering video sessions.
2. Objectives of different types of sessions: Post-Match and Best Practice.
3. Process by which coach links video sessions to the tactical and technical curriculum.

D. Coach delivery of video-feedback sessions

1. Intended coaching style during video sessions.
2. Reason underpinning their coaching style (player participation vs coach-led).
3. Willing for balancing positive and negative feedback and underpinning rationale.
4. Rationale underpinning players clipping their clips and presenting back to the rest of squad.
5. Reasons underlying different coaching styles (interaction vs coach feedback) at different times.

E. Coach behaviours´ concepts and rationales

1. Concept of the term ‘feedback’.
2. Concept of the term ‘questioning’.
3. Level of importance of coach and player within the feedback process.
4. General rationale of feedback and questioning (Simulated-recall interview: 2 clips).
5. Rationale of ‘feedback’ to promote player learning.
6. Rationale of ‘questioning’ to facilitate player learning.

F. End of Interview

Clarification of any queries they might have and appreciation for their time and their responses.

2. STUDY II INTERVIEW GUIDE

Good morning, NAME. It´s a pleasure having you here. The aim today is to explore your thoughts about your delivery at half-time. What do you try doing during this time and which coach behaviours you employ at certain instances and why?

Please, do not take it as if you are being examined. Take it as an opportunity for you to reflect about the things you do well and, maybe, assess whether you think some things could be done differently.

If there are any questions about terms that you do not understand, please feel free to stop and I can clarify. Reminder about confidentiality and use of pseudonyms.

A. Introduction

1. How did you become a coach? or Can you tell me about your favourite coaching seasons and why they were a special part of your career?
2. Can you list the coaching qualifications you have completed before starting this role?
3. What do you see as your role on a match day?
4. Do you think any of the qualifications you have completed have supported you to be able to deliver team talks at half time or pre-match?
    a. Can you give an example of what the content was and how this helped/supported your thinking and learning in this area?

B. General thoughts about half-time talks

1. What do you perceive are the main aim(s) of a half-time talk to be?
    a. Why?
2. What are the key things you try doing during this time?

a. Do you have a list of key things you always try to cover or does this vary game-by-game?

3. So you have identified that you structure the half-time talk (*either list of things or game-by-game depending on response)*, but what do you actually do during this time? (Give examples – you do all the talking to players, pose questions to the players as a group, speak to individuals, let players lead, etc.)
    a. Why?
4. How do you sequence events at half-time?
5. How do you deal with team, units, or individual aspects of the game that you want to reinforce/correct?
    a. Why?

From a positive vs negative point of view:

6. What factors do you think affect your half time team talk the most?
7. How do you think that these affects the message(s) you are trying to deliver?
    a. Does it affect tone? Speed? Volume? Etc.
    b. How do these affect?
8. How do you think your half-time talks vary when winning, losing, or drawing?
9. How do you think your half-time talks vary when …
    a. Playing well – winning
    b. Playing well - drawing
    c. Playing well – losing
    d. Playing bad – losing
    e. Playing bad - drawing
    f. Playing bad – winning

C. Questioning, feedback, and silence withing half-time

1. Do you think questioning is important at half-time talks?
2. What is the purpose of questions at half-time?
3. How do you think questioning can aid at half-time and why?
4. When would you use questions at half-time and why?
5. How would you structure questioning within this environment?
    a. Would you be more convergent or divergent and why?
    b. How would you structure a sequence of questions?
6. Are there any limitations for using questions at half-time?
7. Do you think providing feedback is important at half-time?
8. How important is feedback during half-time and why?
9. Can you put examples of times when players understand what you told them and do you often see the desired changes during the second half?
    a. Is this always the case? If not, why do you think that might be?
10. How would you structure positive, negative, and corrective feedback when: - Why?
    a. Playing well – winning
    b. Playing well - drawing
    c. Playing well – losing
    d. Playing bad – losing

e. Playing bad - drawing
f. Playing bad – winning

11. Are there any times during half-time team talks when remaining silent is important or can be a beneficial strategy?
12. At which instances during half-time does silence covers importance?
13. How can coach silence during half time be useful for player learning, thinking, and understanding?
14. Simulated Recall: Player participation; questioning (convergent and divergent); positive, negative, and corrective feedback.
    a. What are you trying to do in that situation?
    b. What do you think of the feedback/question you are asking at that instance?
    c. How do you think the message is getting across effectively?
    d. Etc.

3. STUDY III INTERVIEW GUIDES

Debrief interview

Behaviour	Number	Interview questions
Feedback	1	What type of feedback do you normally give during your post-match VBF sessions?
	2	Would you provide individual negative feedback within a group session? If yes, under which circumstances?
Questioning	3	What type of questions do you normally use during your post-match VBF sessions?
	4	What would you do if players cannot answer a particular question?
	5	Do your questions differ during training compared to VBF sessions? If yes, how are they different?
Silence	6	When does silence can be used to facilitate players' learning during your post-match VBF sessions?

Reflective interview

A. Familiarisation with data

B. Phase 1: General explanation about this interview (Aims, structure, expected timing, and confidentiality).

C. Phase 2: Coach background

1. ¿Who´d be the person/couple of people that had higher impact on your coaching philosophy?
    a. Why?
2. ¿When was the first time you delivered a video-based feedback session and up to this season?
    b. How do you think you have evolved in your delivery approach?
3. What is the focus of these sessions technical, tactical, physical, or psycho/sociological?

D. Phase 3: Video-feedback delivery approach

1. What are your thoughts on your quantitative data?
    a. Is there anything that you are very happy with or anything you think you´ve got to change?
2. What are your thoughts on your corrective feedback?
    a. What do you think is more beneficial negative or corrective feedback, why?
3. Are you happy with your % time spent in positive, negative, and corrective feedback?
    a. Why?
4. What do you think about the ratio between convergent and divergent questioning?

5. Are you happy with your % time spent in convergent and divergent questioning and your player participation? Why?
6. CLIP: Why are you asking a 2nd question after a wrong response in this situation? Why other times, rather than asking a 2nd question you might provide the information?
7. What do you think about the ratio between Feedback and Interactive/Reflective behaviours? Why?
8. What are your thoughts on the % time spent in Silence (17.92%) when compared to Feedback and Interactive/Reflective behaviour? – In which situations make sense for you to be in silent and what for?
9. Would you do anything different if you were working with U16/18?

E. Phase 4: Future improvements and clarification

1. How useful seeing your performance in numbers within various sessions is for your development?
2. Within the video-based feedback sessions, is there anything that we could do in the future that you think that can be useful?
3. Clarification of any queries and appreciation for their time and their responses.

Consolidation interview

A. Introduction

Morning NAME. How are you?

The objective today is seeing your recall about the delivery of video-feedback sessions. So those conclusions you reached after showing your own data, how much can you recall. This is not an evaluation to you, it is rather an evaluation for us to check whether the methodology employed has been effective and whether it can have an effect on behaviour over time.

Remind confidentiality and use of pseudonyms.

B. Phase 1: General recall of context

1. With your age-group last year (U13), what was your overall objective delivering those post-match video-based sessions?
2. Can you remember how the environment and delivery of the sessions was like?
3. What do you think the main purpose of providing post-match feedback is?

C. Phase 2: Behaviour rationales and timings

Questioning

1. What do you think the point of asking questions was within this environment?
2. Why would you re-question?
3. Why is important to promote player participation?
4. Why would you be more divergent or convergent?

Silence

1. When and why did you use silence within a video-feedback session?
2. How necessary do you think coach feedback is during these sessions?
    a. Why?
    b. At which instance within a clip?

Feedback

1. Do you think about how you are going to give feedback during analysis sessions before you do it?
2. What types of feedback do you tend to use – Not what you should do?
    a. Why?

Behaviour organisation

1. Can you talk me through how you might usually sequence your behaviours to showing a particular 'individual' clip during an analysis session
2. Can you talk me through how you might usually sequence your behaviours to showing a particular 'team-based' clip during an analysis session?

D. Phase 3: Analysis of past delivery

1. Can you remember the behavioural sub/categories included in analysis?
2. Can you remember the scores (% time) obtained in all of them?

Feeback:

a. Positive
b. Negative
c. Corrective

Interactive/reflective behaviour:

a. Convergent
b. Divergent
c. Player Participation

Silence

E. Phase 4: Conclusions reached at post-interview – Display behaviour data

1. What are your thoughts on the behaviours you exhibited during the analysis sessions?
2. What do you think about the total amount of feedback you gave? Why?
    a. How do you feel about your percentages time of positive, negative, and corrective feedback?
    b. What do you think might influence how much positive, negative, and corrective feedback you provide?

Make sure they cover all three and do not only focus on one

3. What do you think about your % time of PP? What about the relationship between PP frequency count and % time?
    a. Why?
4. What are your thoughts on your amount of convergent and divergent questioning? Why?
    a. Do you think this might be linked to any other behaviour? Why?

5. If you were going to deliver a session tomorrow, how would you organise your behaviours across a clip? Why?

a. How would it vary if it was an Individual clip? Adjust behaviours %.

b. How would it vary if it was a team-based clip? Adjust behaviours %.

4. STUDY IV INTERVIEW GUIDES

Pre-intervention interview

A. Phase 1 – Introduction

General explanations about this interview process (aims, structure, expected timing and confidentiality)

B. Phase 2 – Coach background

1. How did you become a coach?
2. Can you give some details of the qualification you had to pass in order to get into this role?
3. What is the type of player and person that you want to develop?

C. Phase 3 – Coach behaviours

1. Which behaviours facilitate learning to a greater extent?
2. Are there any reasons why sometimes you try to promote more interaction and other times you are more directive?
3. What is more beneficial for player learning: asking a question or giving him feedback?
    a. Why?

D. Phase 4 – Coach behaviours within training

Feedback

1. How do you balance positive and negative feedback? Why?
2. How do you prefer providing positive and negative group in front of the teammates or individually?
    a. Why?

Questioning

3. What´s the difference between divergent or convergent questioning?
4. In which situations you would use them?
5. Within breaks and ball rolling time when would you use convergent and divergent questioning?
    a. Why?

Silence

6. Are there any situations during training in which silence can favour player learning?
    a. How?

E. Phase 5 – End of Interview

1. In a game situation, if you see the mistake of player that would you use instruction, silence or questioning? Why?
2. In a game situation, if you see the mistake of player that can cost the team a goal against, would you use instruction, silence or questioning? Why?
3. Clarification of any queries they might have and appreciation for their time and their responses.

Post-intervention interview

A. Phase 1: General explanation about this interview (aims, structure, expected timing, and confidentiality). Objectives: Exploring your thoughts about when to use questioning, your opinion with regards to this years' experience of being filmed, the difficulties for changing your behaviours and the barriers experimented when watching some of your clips in order to change your behaviours during training. Reminding confidentiality.

B. Phase 2: Coach Background.

1. Who would you say has been the person/people who had most influence on your coaching philosophy?
2. Where, when, and how have you learnt to coach?
3. Before this year, can you think of any situations in which you modified the way you coach and tell why you started acting differently?

C. Phase 3: The use of questioning within practice, between practices, and when stopping practices.

1. In your previous interview you highlight the importance of using questions. Why questioning is important during training sessions?

2. During/In between practices or after stopping the practice or when the ball is out of play; when do you think is the best time during training to ask questions and create dialogues with players?

    a. Why?

3. During/In between practices or after stopping the practice or when the ball goes out of play; when do you think is the best time to ask convergent and divergent questions?

    a. Why?

4. What´s the point of stopping the practice for questioning?
5. In your previous interview you highlighted the importance of providing positive feedback (Explanation of positive, negative, and corrective feedback). When would you use each type of feedback?
6. What are your thoughts on corrective feedback?
    a. What do you think is more beneficial negative or corrective feedback?

D. Phase 4: Coach Analysis, reflection, and behaviour modification.

1. Your objectives were a and b. To which extent you think you have attained them?

2. What are the main barriers impeding you to coach according to your objectives?

3. How do you think the pressure of the competition can change your coach behaviours in training?

4. How do you think questioning levels must vary across the season?

5. Are there any other difficulties that did not allow your modification of behaviours?

6. I have sent you all the training sessions that I filmed. ¿How many of them have you used to watch yourself back?

    a. Overall, ¿how do you think watching your sessions back helped you in terms of changing the way you coach?

7. How do you think sending you certain clips with questions to reflect has helped you?

8. How has this helped to change your behaviours in line with your objectives?

9. What has been the impact or to which extent you have changed the way you coach due to the filming and reflecting process?

10. By and large, ¿what do you think of the filming process carried out this year? Positive aspects and areas of improvements.

Consolidation interview

A. Introduction

Morning COACH A. The objective today is to talk about your use of questioning during training sessions. Can you recall the conclusions you reached last year, and how much can you recall? Afterwards, I will show your questioning data during "training moments", so that we can explore your thoughts and reasons for your current and previous delivery. This is not an evaluation of you. It is an evaluation for us to check whether the methodology employed has been effective and whether it can have an effect on behaviour/knowledge over time.

Remind confidentiality and use of pseudonyms.

B. Phase 1: Recall of age-group, context, and coach analysis project

1. Can you remind me about the age-group you worked with last year and the time and place of your training sessions?
    a. Did you have any limitations within that context?
2. How were your players as a group and individuals, and did this influence your delivery during training?
    a. Can you provide any specific examples to support this?
3. Can you remember what your objectives were with regards to questioning?
    a. Increase questioning but what else? - Think when it is best used.
4. Can you remember the developmental activities that we did with you last year (Training)?
    a. How effective do you feel they were?
    b. Did you feel that both activities were beneficial to: Increase Q & Understand its appropriate timing?
        i. How do you think they were beneficial?
    c. Have they been incorporated to your practice?
        i. What have you now incorporated?

C. Phase 2: Rationales for using questioning and its types

1. Can you remind me what was the point of asking a question instead of giving direct feedback/instruction?
    a. Why is player thinking important?
2. How can a question facilitate players´ learning within training?
    a. How well do you think you use questions within sessions?

3. Can you remember the types of questions a coach can use?
4. Can you explain your understanding of the difference between both convergent and divergent questions?
    a. Why might it be best to use a divergent?
    b. Why might it be best to use a convergent?
5. How do you think these two types of questions can be combined to help facilitating player learning within an intervention-practice?
    a. When do you think mixing these up could be possible and why?

D. Phase 3: Rationales of appropriate timings for questions

Last year we split training into four moments: (1) During practice, (2) In between practices, (3) when coach stops practice, and (4) when the ball goes out of play.

1. When is/are the best moment/s to asking questions in general? Why?
    a. How much do you think you do this now?
    b. What might influence your decision to ask a question or not?
2. When is/are the best time/s to use convergent questions?
    a. Why?
    b. (David) During your sessions I have seen that sometimes during the practice (ball rolling), you get close to a player in the immediate zone and ask a question and leave (without waiting for a response). What might be the reason for doing this?
3. When is/are the best time/s to use divergent questions?
    a. Why?
4. If you wanted to maintain a conversation/dialogue with the player, what type of question/s would you mainly use?
    a. Why?
    b. When would you ask this question? Why?
    c. If does not mention in between, ask: what type of questions are suited in between practices, why?
5. What do you think the point of stopping a practice and asking a question is?
    a. How frequently would you do this?
        i. What would be your criteria for stopping a practice or not?
    b. What is the point of speaking to an individual player in the far zone?
    c. What would you be your criteria for speaking to an individual in the far zone rather than stopping the practice?

6. In some of your sessions I have seen that when the ball went out of play, you introduced a ball. What is the point of this approach?
7. Other times, I realised you waited for the ball going out of play to stop the practice and ask players about something that had happened previously. Why would you do this?

E. Phase 4: Stimulated recall for timing of questions

1. During practice clip: Indicate question type and your opinion on the clip.
2. In between practices clip: Indicate question type and your opinion on the clip.
3. Coach stops practice clip: Indicate question type and your opinion on the clip.
4. Ball out of play clip: Indicate question type and your opinion on the clip.
5. Far zone clip: question type and your opinion on the clip.

CURRICULUM VITAE

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Lecturing & Researching Personnel in Football & Coaching (FPU)
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Faculty of Sport Sciences
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Academic education and scholarships

2018-2022 **PhD** in Coach Development, University of Granada.

2014-2018 **Masters of Philosophy** in Coaching Science, Liverpool John Moores University.

- 2014 Grant for Abroad Postgraduate Students, Fundación Mutua Madrileña.

2014-2015 **PGCE**, Valencia International University – QTS validated.

2009-2014 **BSc**(Hons) Sport Sciences – 1st class degree, University of Granada.

- 2013-2014 Extraordinary End-of-Degree Award, University of Granada.
- 2013-2014 Grant for Research Initiation, University of Granada.
- 2012-2013 Erasmus Exchange, Liverpool John Moores University.

Professional qualifications

2020-2021 **UEFA Pro** in Football Coaching License, The Spanish FA.

2018-2019 University **Specialist in Youth Development**, La Liga Business School.

2015-2016 **UEFA A** Football Coaching License, The Spanish FA.

Youth Coaching Modules 1, 2, & 3, The English FA.

2012-2014 **Prozone** Performance Analysis Levels 1, 2, and 3.

2011-2012 **UEFA B** Football Coaching License, The Spanish FA

Teaching and lecturing experience

2019-2022 *European University of Madrid*: **Lecturer in Coaching**
(International Masters of Football Coaching & Management).

- "Integrating physical and tactical contents: Implications for practice design".
- "The provision of effective questions and corrections during training".
- "The delivery of pre-, post-match, and opposition video analysis sessions".
- "Pre-match and half-time talks: Generating action in the changing room".

2018-2021 *University of Granada*: **Lecturer in Football & Coaching**.

- Fundamentals of Football (Year 2 undergraduate students).
- Fundamentals of Gymnastics (Year 1 undergraduate students).
- Teaching Youth Football (Year 3 undergraduate students).
- Sport Specialisation: Football (Year 4 undergraduate students).

2017-2018 *Liverpool John Moores University*: **Teaching Officer**.

- Applied Science and Football 2 (Year 2 undergraduate students).
- Prozone Performance Analysis Levels 1, 2, and 3 (external students).

Football industry experience

2018-2021 *La Liga Club:* **Academy Coach Developer** supporting coaches during:

- Pre-match talks: Promoting appropriate motivational climates.
- Half-time talks: Facilitating game understanding and generating the appropriate emotions.
- Training sessions: Providing effective questions and corrections.
- Video sessions: Facilitating understanding and accurate recall of game objectives.

2019-2020 *Granada CF:* **U13's Academy Coach**

- Leading tactical training sessions with a development focus or in preparation for games.
- Planning and delivering individual and group pre- and post-match video analysis sessions.
- Working on position specific work that meet players' individual learning outcomes.

2018-2019 *Levante UD:* **International Coach & Scout**

- Teaching the playing philosophy and positional requirements of Levante UD teams to foreign players.

- Transmitting foreign coaches Levante's UD coaching philosophy through workshop and practice.
- Identifying local talents in SA, US, and UK and reporting on their player profile.

2017-2018 *Aston Villa FC:* **U23's Assistant Analyst & Coach Development Officer**

- Assisting the Lead Analyst for matchdays and preparing opposition and pre-match content.
- Analysing coaches and promoting dialogue on effective coaching strategies.
- Assisted the Head of Coaching to develop the 'Academy Performance Plan'.

My performance in these tasks was key for Aston Villa's academy achieving the Premier League Category 1 status. These were awarded with the club's Official Recognition

2015-2017 *Aston Villa FC*: **Academy Performance Analyst**

- Leading the weekly analysis procedures for the U16's, U14's, and U13's age-groups.
- Coordinating the individual position specific analysis-training plans for the U16-12 phase.

2015-2016 *English Football Association:* **National Team Sport Science Data Analyst**

- Reporting to Head of Medical Services on the relationship between in and off-camp training load and player's injury/illness.

2014-2015 *Everton FC*: **Academy Sport Science Assistant**

2013-2014 *Granada CF*: **U17's Academy Match Analyst**

2011-2012 *Churriana CF*: **First Team Fitness Coach and U12's Academy Coach**

International research stays

2021-2022 Institut für Sportwissenschaft, Eberhard Karls Universität Tübingen, Germany.
Supervisor: Dr. Oliver Höner (3 months).

2021-2022 Departamento de Ciências do Desporto, Universidade da Beira Interior, Portugal
Supervisor: Dr. Bruno Travassos (3 months).

2020-2021 The Football Exchange, Research Institute for Sport and Exercise, UK.
Supervisor: Dr. Allistair P. McRobert (3 months).

Research Projects

2022-2023 Analysis and development of youth soccer players' talent within Granada CF training ground. Funded by University of Granada.

2021-2023 Development and application of a programme of physical activity based on the the employability perspectives of individuals with intellectual disabilities. Funded by Cátedra UGR – Vivagym Funndación Adecco: 6200€

Publications

- Raya-Castellano, P.E., Reeves, M.J., Cárdenas, D., Fradua, L, & McRobert, A.P. (2022b). The half-time talk: A mixed-method examination of youth-elite football coaches' behaviours and team-management strategies. *International Journal of Sports Science & Coaching*. Accepted.
- Raya-Castellano, P. E., McRobert, A. P., Cárdenas, D., Fradua, L., & Reeves, M. J. (2022a). Exploring the 'teachable moments' of questioning during training: a work-based coach development programme affecting behaviour change. *Physical Education and Sport Pedagogy*.
- Raya-Castellano, P. E., Reeves, M. J., Fradua, L., & McRobert, A. P. (2021). Post-match video-based feedback: A longitudinal work-based coach development program stimulating changes in coaches' knowledge and understanding. *International Journal of Sports Science and Coaching*, *16*(6), 1259–1270.
- Raya-Castellano, P. E., Reeves, M. J., Littlewood, M., & McRobert, A. P. (2020). An exploratory investigation of junior-elite football coaches' behaviours during video-based feedback sessions. *International Journal of Performance Analysis in Sport*, *20*(4), 729–746.
- Raya-Castellano, P. E., & Fradua, L. (2015). A review of the multidisciplinary approach to develop elite players at professional football academies: Applying science to a professional context. *International Journal of Performance Analysis in Sport*, *15*(1), 1–19.

Communications, invited talks, and posters

- Raya-Castellano, P.E. (2022). Looking for a 'space' within the Sport Science labour market. *Facultad de Ciencias de la Actividad Física y el Deporte, Universidad Europea de Madrid*: **Invited talk** (Madrid, 22nd of September, 2022).

- Raya-Castellano, P.E., Reeves, M.J., Cárdenas, D., Fradua, L, & McRobert, A.P. (2022). A mixed-method investigation of youth football coaches' behaviours at half-time. *European Congress of Sport Sciences*: **Presentation** (Sevilla, 1st of September 2022).
- Raya-Castellano, P.E., McRobert, A.P., Cárdenas, D., Fradua, L., & Reeves, M. (2022). The impact of video-based reflection on youth football coaches' questioning practices. *World Congress of Science and Soccer:* **Poster** (Coimbra, 15th of May 2022).
- Raya-Castellano, P.E. (2022). Generar climas motivacionales apropiados durante las charlas pre-partido. *Departamento de Metodología, Real Club Deportivo Mallorca*: **Invited talk** (Mallorca, 7th of April 2022).
- Raya-Castellano, P.E. (2022). The half-time talk: Generating emotion and action. *Facultade de Motricidade Humana, Universidade de Lisboa*: **Invited talk** (Lisboa, 8th of February 2022).
- Raya-Castellano, P.E. (2020). El modelo comprensivo: Utilización del feedback interrogativo en etapas de formación. *Facultad de Ciencias de la Salud y del Deporte, Universidad de Zaragoza*: **Invited talk** (Zaragoza, 15th of December 2020).
- Raya-Castellano, P.E. (2019). The pre-match talk: A multiple-method examination of youth-elite football coaches' motivational content. *Escuela Universitaria Real Madrid*: **Invited talk** (Madrid, 20th of March 2019).
- Raya-Castellano, P.E. & McRobert, A.P. (2018). A comparison between two youth coaches' behaviours and underpinning cognitions during video-based feedback sessions: Implications for coach development. *3rd International Conference of Football - Training Methods & Social Issues*: **Best Poster Contribution** (Valencia, 7th of March 2018).
- Raya-Castellano, P.E. (2017). The coaching pedagogical approaches employed at video-feedback sessions within professional football academy. *Research Institute for Sport and Exercise Sciences, Liverpool John Moores University:* **Invited talk** (Liverpool, 19th of July 2017).
- Raya-Castellano, P.E. (2017). An unexpected journey into professional English football. *School of Sport, Exercise, and Rehabilitation Sciences, University of Birmingham*: **Invited talk** (Birmingham, 9th of November 2017).

ACKNOWLEDGEMENTS

Durante la carrera, un profesor nos "obligó" a leer un artículo subtitulado 'Challenging the Tradition' (Williams & Hodges, 2005) que ponía en duda que el entrenador tuviera que dar instrucciones continuamente para mejorar a los jugadores. En esa época, yo era un joven de 20 años que jugaba como "falso nueve" en un equipo granadino también conocido como "Ajax" de Albolote, con compañeros de hasta 15 años más que yo. En un entrenamiento, recuerdo estar en último tercio y tener opción de superar al último defensa con un simple pase. Para impresionar al Míster, decidí regatear, superé al defensor, y chuté a portería con la mala suerte de que el lanzamiento se fue ligeramente desviado. Mi pensamiento inmediato fue "tío tenías que haberla pasado". Mientras estaba pensando esto, uno de los centrales más veteranos me vociferó: "¡pero pásala hombre!". De repente, el míster se dirige a él y le dice "Cristian, él ya sabe que se ha equivocado. A veces no hace falta decir nada". Cuanto bien me hicieron esas palabras … Hoy, 11 años más tarde, después de 13 años de educación universitaria, 4 años y medio de doctorado, 5 universidades, 4 países, una pandemia mundial, 56.706 palabras, y 6 clubes, ha llegado el momento de defender una Tesis Doctoral sobre la comunicación del entrenador. Volver a mi casa tras mi periplo en Inglaterra no ha resultado fácil, pero me ha hecho crecer y cruzarme con personas que me han aportado mucho.

En primer lugar, quiero dedicar esta Tesis Doctoral a mi **abuela María Luisa**. He tenido tanta suerte de tenerte a escasos 100 m de la facultad…No solo por la comida que me has preparado cada día desde que empecé como alumno en 2009, sino por como nos hemos comprendido y las conversaciones cada vez más interesantes que hemos tenido. ¡Eres mucho más que una abuela! En segundo lugar, a mis **padres Salvador** y **Cristina**, por tantos años de esfuerzo para que el "nene", que no se estaba quieto en la silla, saliera adelante. *Papá* gracias por demostrarnos que aún siendo "casero" el mundo es muy grande y tu actitud práctica frente a las incomodidades. *Mamá* uno de los mejores planes de fin de semana que se pueden tener es irnos de acampada o en bicicleta. ¡Vivan las aventureras! Gracias por entenderme y escucharme siempre ☺. Tampoco puedo olvidarme de mis **hermanos Juan Salvador** y **Rodrigo**, cada uno con su estilo. ¡Vaya dos aviones me ha regalado la vida! Al principio era mucha presión, pero ahora puedo decir que ser el mediano es una posición privilegiada para aprender de los dos polos. *JuanSil* – gracias por haber sido mi primer entrenador. Ir siguiendo tus pasos, me ha ayudado mucho a evolucionar en muchas facetas de la vida. *Rodri* - es difícil que los hermanos pequeños enseñen tanto de la vida a los mayores. ¡Eres muy grande! Siento haberte chinchado tanto cuando eras peque, ¡Operación TV!

A nivel académico durante estos más de 13 años, he tenido la suerte de que varios profesores universitarios me hayan guiado, inspirado, mentorizado, y ayudado. Y no sólo en lo

académico. **Luis**, has sido un gran referente para mi y el mayor responsable de que haya elegido esta carrera profesional. Desde la asignatura de 3º, mi manera de entender el juego cambió. Me has exigido, apoyado, impulsado, animado a innovar, y sin ti la experiencia de estos años como asesor-formador de entrenadores no habría sido posible. Eskerrik asko, espero que podamos seguir compartiendo ideas y fútbol en los próximos años. **Allistair**, thanks for caring. As a personal tutor (when I was an Erasmus student in Liverpool) and director of studies. You have been much more than a mentor during the past 11 years and massively helped to settle and survive in UK. I still remember the first time you revised my first manuscript, it looked like China's flag. A great quote from you: "Life is about much more than just publishing papers". **Matt**, you have been one of those winter signings you never know how is going to fit within the team but who has made a real difference into my writing. You have encouraged me to organise and express ideas in more innovative and clear ways and have always been available for anything. Even on a rainy Sunday afternoon you were willing to print me a few papers and knock on my door at Everton Park. Thank you. **David**, estos años de aprendizaje sin ti ni habrían ocurrido y a ambos sabemos por qué. Gracias por tu atención a los pequeños detalles en los artículos, tu practicidad, y haberte encargado de firmar toda la burocracia sin haber mostrado nunca queja alguna. Siempre te estaré agradecido por haber respetado mi momento vital durante esta etapa.

Gracias al Departamento de Educación Física y Deportiva. En especial de **Raquel, Eli, Alfonso, y Cristóbal** por promover que durante los años de FPU haya podido impartir docencia específica de fútbol (Fundamentos, Perfeccionamiento, y Especialización). Soy consciente de lo difícil que es cuadrar el POD un año tras otro y que todo el mundo esté contento. Al personal de material, instalaciones, y consejería; especialmente a **Luis** y **Ester** por ir más allá de lo que teóricamente consiste vuestro trabajo. Sin personas con vuestra actitud cualquier centro de trabajo se hunde. A los otros PDIs con los que he compartido muchas horas de penurias y risas en la sala, y a sus amigos o novias: **Pedro, Palomikah, Fran, Bea, Blanca, Elia, Milkana, Víctor, María López, Álex Pérez, Javi Sevil, Pablo Campos, Caro, Dani, Romina, Gabri, Lucía, Abel, Capote, Iker**, **Rafa Prieto,** y otros muchos más - La palabra compañeros se os queda corta. A los amigos de Cáceres (**Tomás, Pulido, Tapia, David, Jesús, Miguel, JoseCa** …) por haberme recibido con los brazos abiertos y permitido profundizar en el aspecto psicológico de la comunicación. A **Emilio, Gabri, y Rafa**, ayudantes de grabación y codificación, mil gracias. Y por supuesto, a mis participantes y entrenadores (**JAG, EM, CR, CC, DP, DM, AS, BQ, RB, AS, JAM, IS, RT, y OFL**) a quien espero haberos aportado la décima parte de lo que vosotros me habéis dado estos años.

Con tanto "viajecito" estos años he conocido a muchas personas en el ámbito el fútbol y/o la Universidad a las que les tengo especial aprecio. **Martin** you are a true BigWood and will be always grateful for you opening the gates of Premier League academy football. **Mark, Sean, Muff, Tom, Dan,** and others; I really enjoyed working with you as an analyst and understanding what involves being a Villa and 'the Villa way'. Phrases such as "taking care of the ball", "getting the ball into wide areas and get the crosses in", "preparing defensive transition", etc. that sounded a bit vague for a Spaniard initially, make much more sense after having gone through clips and discussed with you. **Sean Rooney** – you are probably not aware of how our meeting in Nuneaton a few years ago stimulated my willing to get involved in this project and gave me great ideas. Gracias **José Tornero** por tu ayuda y recomendarme y a **Álex Sánchez** por haber confiado en esto de los climas motivacionales y las emociones durante las charlas pre-partido y de descanso. Ir a visitaros de manera esporádica y a los alumnos internacionales ha sido siempre un subidón. A **Rafa Ballester** por tenerme siempre en mente y los momentos de fútbol y aprendizaje que espero sigamos compartiendo. It would not be fair to forget **Oliver Höner**, **Bruno Travassos**, and **their PhDs students/staff** who hosted me at their universities and who have enabled me to learn about more positivist research methods. Especialmente gostaria de agradecer a **Bruno, João, Ferraz, e Farzard** pela sua hospitalidade. Fez de Portugal e Covilhã dois lugares muito especiais para mim.

Tanto "viajecito" también me ha permitido conocer personas fuera del fútbol. Muchas de ellas se han convertido en amigos que quizás no ves todos los días, pero cuyo afecto y apoyo ha sido enorme. Me vienen a la cabeza **José, Belén, Raúl, Mercedes, Sara, Jaime, Héctor, Vicky, Patri, Guille, Helen y Clau Bolu, Metro, Pare, Karla, Samu, Sara Perea, Enrique, Migue, Riverinho, Paco, Carmen, Blanca Tomás, Liz, Alicia, Álvaro Calvo, Ester**… - Me encanta que nos veamos improvisadamente en cualquier lugar de España o el mundo. Gracias también a mis amigos "**los Manjoneros"** por su cariño y sentimiento de grupo desde que dejamos el instituto. Cada uno de su padre y de su madre, pero con los que sin duda aprendes a respetar la variedad y a entender de otras áreas de conocimiento. No miento cuando digo que de ese grupo saldrán varios Premios Nobel. A mis tíos y primos por haberme acompañado durante estos años a vuestra manera y con vuestro estilo. Echo de menos las macro-cenas de Navidad de los Raya y deseando salir con las alforjas con los Castellano. Y, por último, a **María CB** por reaparecer y subirte al barco en el sprint final (¡Y vaya sprint!). Siempre has estado presente. Gracias por tanta luz.

"La comunicación con el jugador es fundamental para potenciar la atención, la memoria, la comprensión, o el procesamiento de la información. A través de preguntas, podemos generar conflictos cognitivos al jugador y promover un aprendizaje conjunto mediante diálogos que fomenten la reflexión".

Miguel Ángel Ruiz , *Former Sporting Director at Atlético de Madrid, Tenerife, & Valencia CF*

"As a manager, it is imperative that you deliver clear information. I try avoid words like 'always' and 'never'. 'Always make a run to the near post when in a crossing position', this might not always be the case. I've felt the benefit of effective communication by leaving no grey areas and helping players/teams achieve their full potential".

Gary Brabin, Former Manager & Current *Sporting Director at The New Saints FC*

"Uno de los pilares para el desarrollo de los jugadores es la comunicación. Conocer los contenidos a transmitir es básico para cualquier interacción entrenador-jugador. También, lo son elegir el momento para hacerlo, valorar las palabras clave, el tono a utilizar, y evitar que emociones negativas contaminen el canal. Además, es determinante establecer una escucha activa que permita la bidireccionalidad del proceso".

Óscar Felipe Larralde, *Former Marbella FC & Granada CF Head of Coaching*

""En las dos dimensiones profesionales en las que desarrollo mi trabajo, para una evolución favorable del aprendizaje del receptor, la comunicación es un factor fundamental. A nivel deportivo, conforme han avanzado los años, independientemente de la edad del grupo que dirijas, una buena comunicación es clave para el aprendizaje y la evolución de los jugadores".

Alberto Salazar , *PE Teacher and Former Granada CF Academy Coach*

"A key characteristic of a coach is being able to understand individuals. As a player, I enjoyed looking at past performances in the classroom and working on technical improvements on the grass. As a coach, having the ability to understand how each individual learns and adapting the WHAT, WHEN, and HOW of your communication is key to affect players in the right way".

Mark Delaney , *Former Aston Villa FC player & U23's Manager*