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An exploration of the relationship between educational background and the coaching behaviours and practice activities of professional youth soccer coaches

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An exploration of the relationship between educational background and the coaching behaviours and practice activities of professional youth soccer coaches

Abstract:

Background and Purpose

Despite the proliferation in recent years of higher education establishments offering tertiary-level study in the field of sports coaching, there is a lack of research into the impact of such courses on coaching practice. The behaviours employed and activities used by coaches during practice sessions is an area where one might expect to see such impact, indeed certain studies have tentatively noted the educational qualifications of coaches and suggested that this may play a role in the application of behaviours more aligned with player-learning. The purpose of this study was therefore to compare youth soccer coaches with and without tertiary-level qualifications, examining their coaching behaviours and practice activities.

Method

The participants were ten male professional youth soccer coaches aged 24-55 with an average of 13 years coaching experience. Five of the coaches had completed undergraduate degree courses related to sport coaching. All of the coaches worked with players aged under 9 to under 16 in the youth academy of an English professional soccer club. Systematic observation of coach behaviour and practice activities was carried out using the Coach Analysis and Intervention System (Cushion et al. 2012), while follow-up interviews were used to elicit the coaches' perceptions of, and rationale for, their behaviour.

Findings

The observation data showed that graduate coaches used significantly more divergent questioning than non-graduate coaches, while the interview data revealed a general trend for graduate coaches to show greater self-awareness of behaviours and changes in behaviour between practice types. Graduate coaches also provided more comprehensive rationales, for example, seeing silence as a means of facilitating player decision making as well as for observation. In contrast to previous research, sessions featured a higher proportion of playing form than training form activities and at over twenty percent of session duration,

the ‘other’ practice state was a prominent feature of contact time with players. While some coaches saw ‘other’ as wasted time, graduate coaches identified this as an opportunity for group discussion and social interaction. The study adds to existing data about coach behaviours and practice activities, providing evidence that education background may indeed influence coaching practice.

Keywords: *coaching behaviour; practice activities; systematic observation; coach education; tertiary education.*

Introduction

There has been a proliferation in the number of universities offering tertiary-level study in sport coaching (Taylor and Garrett 2010), and despite claims that these courses have an important role to play in raising standards of coaching (Turner and Nelson 2009), little is known about their impact on graduate coaches’ practice (Mallett, Rynne and Dickens 2013). While such knowledge would provide supporting evidence of course impact (Mallett, Rynne and Billett 2016), in coaching a background as a successful performer still has more relevance, being valued by employers (Blackett, Evans and Piggott 2017), participants (Cushion and Jones 2014) and coaches themselves (Mallett, Rynee and Billett 2016). It is not surprising therefore, that research repeatedly illustrates that much of the knowledge acquired by coaches is picked up through ‘apprenticeships of observation’ as athletes, and subsequent experiential learning and mentoring as neophyte or assistant coaches (e.g., Cassidy and Rossi 2006; Cushion, Armour and Jones 2003; Erickson, Côté, & Fraser-Thomas 2007; Harvey et al. 2013).

The use of systematic observation tools has consistently identified ‘instruction’ as the most frequently used behaviour by coaches during practice (e.g. Cushion and Jones 2001; Ford, Yates and Williams 2010; Kahan 1999; Millard 1996; Partington and Cushion, 2013; Potrac, Jones, and Cushion 2007; O’Connor, Larkin and Williams 2017, 2018; *inter-alia*).

This body of work suggests that a deliberate behavioural strategy or 'what coaches do' is to mix instruction and positive verbalisations, along with periods of silence. Indeed, in some circumstances, research has identified a 'traditional' approach to coaching that is highly directive, autocratic and prescriptive (e.g., Harvey, Cushion, & Massa-Gonzalez 2010; Potrac and Cassidy 2006; Williams and Hodges 2005), with the most recent work suggesting coaches still 'over-coach, with high amounts of instruction and stop-start activity' (O'Connor, Larkin and Williams 2017, 658). That said, the evidence also suggests that coaching behaviour is 'very situation specific and dependent on the interaction of a myriad of influencing contextual variables' (Jones 1997, 30). Mediating factors include, for example, the gender of coach and athlete (e.g. Lacy and Goldston 1990; Millard 1996), the age of the athlete (e.g. Seagrave and Ciancio 1990; Smith and Smoll 1993; Partington, Cushion and Harvey 2014), the type of sport (e.g. Harvey et al. 2013; Claxton 1988; Wandzilak et al. 1988), competition score line (e.g., Calpe-Gómez, Guzmán and Grijalbo 2013), whether the athlete is characterised by high or low expectations (e.g. Wilson, Cushion, and Stephens 2006; Solomon et al. 1998), the skill level of the athlete (e.g. Lacy and Darst 1985; Markland and Martinek 1988), and the aims of the coaching session (e.g. Krane, Eklund, and McDermott 1991). Other factors, such as the coach's level in the coaching structure (e.g. Solomon et al. 1998; Solomon et al. 1996), the stage in the season (e.g. Lacy and Darst 1985; Potrac, Jones, and Armour 2002), the coach's philosophy (Cushion and Jones 2001), and whether it is practice or a competitive match (Smith and Cushion 2006; Partington and Cushion 2012; Trudel, Côté and Bernard 1996) can impact on coach behaviour in a particular context.

Importantly, coaching practice intertwined with contextual variables has an historical and traditional thread where coaches' experiences are powerful, long lasting, and have a continual influence over pedagogical perspectives, practices, beliefs and behaviours

(Cushion, Armour and Jones 2003; Potrac, Jones and Cushion 2007). Therefore, we need to probe more deeply and examine the outcome of coach socialisation experiences, and despite considering a myriad of variables no research has examined specifically the relationships between coaches' educational experience and background and coaching behaviour. Educational background has begun to be highlighted as important and influential on coaches' practice with coaches' educational background suggested as the factor resulting in coaching behaviours more closely aligned with player learning (e.g., Partington, Cushion and Harvey 2014; Potrac 2001; Potrac, Jones and Cushion 2007; Smith and Cushion 2006). For example, studies have proposed coaches' educational background as the link to coaches' use of silence as a deliberate coaching behaviour to allow observation and player decision making to take place (Potrac 2001; Potrac, Jones and Cushion 2007; Smith and Cushion 2006). These studies portray higher levels of silence in both training and competition settings in contrast to the explicitly instructional approach portrayed in other research (e.g. Cushion and Jones 2001; Ford, Yates and Williams 2010; Partington and Cushion 2012, 2013). Noting that the majority of these coaches held tertiary-level qualifications, it was suggested that this educational background may result in an '…ability to "intellectualise" the coaching process…' (Smith and Cushion 2006, 364). Such findings give some support to the suggestion that tertiary education can aid in the development of critical thinking skills for coaches (Mallett et al. 2009; Rynne and Mallett, 2014). Furthermore, Partington, Cushion and Harvey (2014) suggested that educational background (qualified teacher status) resulted in coaches who displayed a different attitude towards instruction, recognising the value of delaying instruction to allow players to engage in self-reflection. In general, these studies suggest a relationship between coach behaviour and educational background worthy of further investigation.

According to current conceptions of coach learning formal education combines with

non-formal courses and ongoing experience in contexts with differing socio-cultural constraints (Stodter and Cushion 2014). However, formal learning is typically understood as governing-body coaching awards and the impact of other types of education (e.g. tertiary level study) has yet to be explored. So, despite a number of studies which report on coaches' perceptions of formal coach certification programmes (e.g. Chesterfield, Potrac and Jones 2010; Nelson, Cushion and Potrac 2013) to our knowledge only one study has explicitly linked education to changes in coach behaviour (Stodter and Cushion 2014). Moreover, despite research into the development of certain skills through tertiary education (e.g. reflection, Knowles et al. 2001; Knowles et al. 2006) and coaches' perceptions of its utility (Mallett, Rynne and Billet 2016), there is currently no evidence that tertiary education courses impact coaching practice (Mallett, Rynne and Dickens 2013) or coaches' practice behaviours.

Systematically identifying the behaviour of coaches using descriptive-analytical systems has been a significant area of research for over 30 years (Cushion et al. 2012). Relatively objective behavioural data are important as coaches have been shown to have limited awareness of what behaviours they use, and how often they use them (cf. Harvey, et al. 2013; Partington and Cushion 2013; Partington et al. 2015; Partington, Cushion and Harvey 2014) – coaches are notoriously poor at describing their own behaviour – with athletes' ratings correlating more strongly with observed behaviours than the coaches' own self-ratings (e.g. Partington and Cushion 2013; Smith and Smoll 2007). It is of course recognised that, as Cushion et al. (2012) argue, coaching behaviours *per se* do not stand alone as predictors of effective coaching (Douge and Hastie 1993) nor do they 'embrace the entirety of the coaching process' (Lyle 1999, 14). Indeed, mixed methodologies are increasingly employed combining systematic observation with interpretive interviewing revealing the rationales underpinning coaches' behaviour and identifying contextual variables

influencing practice (Cope, Partington and Harvey 2017; Cushion et al. 2012; Hall, Gray and Sproule 2016; Potrac, Jones and Cushion 2007). Such an approach provides information about 'what coaches do' and also important insight into 'why' and 'how'.

Given the intuitive link, and some initial correlation, between tertiary-level education and coaching behaviours more aligned with player learning (Cushion, Ford and Williams 2012; Smith and Cushion 2006) a decade on research has not addressed the question posed by Smith and Cushion (2006), who asked whether practical experience alone drives coaches' behaviour, or how and to what extent is educational background a determining factor? Therefore, the purpose of this study was to examine youth soccer coaches coaching behaviour and compare coaches with and without tertiary-level qualifications. The aim was to go some way to providing data showing any indication of differences in coach behaviour and practice activities when considered by educational background. As a result, such an analysis would help highlight coaches' understanding of, and rationale for, their behaviours, and the influences that inform their action in the coaching environment. The significance of such work lies in providing knowledge that is arguably vital in coaching contexts (e.g. professional youth soccer academies) which claim to be focused on 'learning' and 'development', and yet where evidence currently shows a disparity between coaches' practice (i.e. their behaviours and activities) and that promoted by skill acquisition theory (Cushion, Ford and Williams 2012; Partington and Cushion 2013; O'Connor, Larkin and Williams 2017, 2018).

Method

As the research was bounded by a specific time frame, and by a particular case, data were collected using a case study methodology (cf. Cushion, 2018). Berg (2007) defines a case study as 'a method involving systematically gathering enough information about a person, social setting, event, or group to permit the researcher to effectively understand how the

subject operates or functions' (p. 283). In this case, the aim was to gather information on the Academy coach's behaviour and its relationship to their educational background, to 'uncover the manifest interaction of significant factors characteristic of this' (Berg, 2007, p. 284). Importantly, the aim was not to generalise per se, but to generate context dependent knowledge, with the aim that readers might elicit case knowledge that offers authenticity and transferability (Grünbaum, 2007) and recognise where the 'case' aligns with their own biographies and experiences.

Participants and Setting

The participants in the study were ten male professional youth soccer coaches aged between 24-55 (M =38.4 years, SD = 12.05) with an average of 13 years coaching experience (SD = 6.38), with 7.5 years (SD = 5.46) spent in an Academy or Centre of Excellence[2]. Participants were selected through criterion-based purposive sampling (Sparkes & Smith, 2014) – coaches were asked to take part based on their position as soccer coaches within the Academy of a professional soccer club; in addition to this, five coaches were also required to have a degree. The graduate coaches (n=5) had completed undergraduate courses related to coaching (e.g. Applied Sport Science and Coaching), additionally, three had gone on to complete postgraduate degrees related to coaching or education ('Dave', 'Mark' and Andy') and two were qualified teachers ('Dave' and 'Dean') (see Table 1).

Eight of the coaches held the Union of European Football Associations (UEFA) 'B' Coaching Licence, with the remaining two having the UEFA 'A' Licence, these same two had also played professionally in the second highest division of English football. All of the coaches had completed specific governing body coaching qualification designed for coaches of young players (Youth Modules).

[2] Academies (previously known as Centres of Excellence) are the place where professional soccer clubs in England develop their youth players to prepare them for the professional game.

****Table 1 near here****

The setting was the Youth Academy of a League Two club (the fourth division of professional soccer in England) in the North-East of England. The Academy had attained Category Three status under the Elite Player Performance Plan (EPPP) (Premier League 2011), a recently introduced set of rules and regulations which govern professional club's youth development programmes.[3]

The players coached were under 9 to under 16 at the club and undertook between 4.5-6 hours of practice time and one match per week; while players coached aged under 17 and under 18 undertook 12-15 hours of practice and one match. The purpose of the Academy was to develop players, enabling their progression through the age groups to earn full-time professional contracts. Whilst the Academy had a curriculum for coaches to follow, particular practice activities and coaching behaviours were not specified.

Systematic observation

Coaching behaviours and practice activities were coded using the Coach Analysis and Intervention System (CAIS) (Cushion et al. 2012) (see Table 2). In terms of secondary detail, timing (pre-, concurrent, post-) of instruction, type of question (divergent, convergent) and nature of silence (on-task, off-task) were included due to their relationship to key coaching behaviours (Cushion, Ford and Williams 2012; Partington, Cushion and Harvey 2014). With regard to practice activities, 'training form' was defined as any activity without a game related focus (e.g. physiological, technical and skill based activities); 'playing form' was defined as those activities with a game related focus (e.g. phases of play, conditioned and

[3] There are four categories of academy (Category One having the most stringent criteria), differences between them include facilities, staffing levels and player contact time.

small-sided games); the ‘other’ category was time spent on transitions between activities, water breaks, or when the coach was organising/addressing the players (Cushion et al. 2012).

****Table 2 near here****

Interpretive interview

Although the use of systematic observation provided descriptive data of the coaches’ behaviour and practice activities during sessions, it did not give any insight into the rationale that informed those behaviours (Cushion et al. 2012). Therefore, interviews were used to explore the coaches’ perceptions of the ‘attitudes, opinions, beliefs and values’ (Potrac, Jones and Armour 2002, 186) that underpinned their actions, to understand the impact of educational background on coaches’ practice.

The semi-structured approach included questions about biographic and demographic information, perceived behaviours and practice types, before considering the CAIS behaviour categories and the observational data (Partington, Cushion and Harvey 2014). The coaches’ perceptions of the impact on their practice of education, coaching courses, coaching background and playing experiences were also explored.

Procedures

Systematic observation and reliability

Following University ethics approval, a total of 39 practice sessions were filmed, providing 3154 minutes of footage. In order to ensure an adequate picture of coaching practice, it is recommended that at least three sessions are observed (Brewer and Jones 2002; Cope, Partington and Harvey 2017). Therefore, following previous empirical research (e.g. Claxton 1988; Ford, Yates and Williams 2010; Lacy and Darst 1985), each coach was observed a minimum of three times (M = 3.9, SD = 0.74). To establish reliability, inter- and intra-

observer testing was carried out (Cope, Partington and Harvey 2017; Van Der Mars 1989). Due to the complexity of the observation instrument, eighty percent was set as the level of agreement (Cushion et al. 2012). Inter-observer reliability for coaching behaviours was 81.9%, while intra-observer reliability was 83.5%. For practice states, inter-observer reliability was 95.8%, and intra-observer reliability was 96.1%. All of these figures therefore exceeded the accepted level of eighty percent agreement (Cushion et al. 2012).

Interpretive interviews

The interviews were conducted after the systematic observations and behaviour data coding had been completed. The protocol for the interviews followed that established by previous research (e.g. Partington, Cushion and Harvey 2014). Firstly, without having sight of their behaviour data, coaches were asked about their coaching behaviours (i.e. what behaviours do you use and why?); they were then shown the CAIS definitions and could elaborate on their previous answers if they felt it necessary (i.e. if they saw a behaviour in the observation instrument that they had not considered); lastly, they were presented with their behaviour data and asked for their views (i.e. what are your views on the results of the observations?). Coaches' answers were probed to elicit greater detail or clarification where necessary (Sparkes and Smith 2014). Duration of the interviews ranged from fifty-six to seventy-six minutes (mean duration 66 min.) and the recordings were subsequently transcribed verbatim.

Data analysis

Systematic observation

Data were analysed descriptively and for the comparative analysis, significance was set at $P<0.05$ unless otherwise stated. For overall coaching behaviours, independent t-tests were conducted to compare the overall totals and RPM of discrete behaviours for the graduate and

non-graduate coaches. A one-way repeated measures ANOVA was undertaken to determine if significant differences were evident in the proportion of sessions spent in training, playing and other practice states by coaches from the graduate and non-graduate group. Mauchly's Test of Sphericity was significant ($p<0.05$), so Greenhouse-Geisser corrections were used. To analyse the use of behaviours in the three different practice states (training, playing and other), a repeated measures ANOVA was used for the percentage and RPM of each discrete behaviour. Any identified interaction effects between practice state and coach status were followed up with independent t-tests, this was in order to locate the practice state in which significant differences were present. Mixed-model ANOVAs were used to compare convergent and divergent questioning, and the timing of instruction behaviours (pre-, concurrent, post-). To follow up on the comparison of question types, a paired samples t-test was used, while a one-way ANOVA was applied to the timing of instruction.

Interpretive interviews

The interview data were analysed using abductive analysis, which involved moving back and forth between deduction and induction (Morgan 2007). Firstly, the interview data were read and re-read for familiarisation before initial open coding was completed line-by-line at a descriptive level (Taylor 2014). This process of descriptive coding involved the addition of codes to text segments in the transcripts to organise data and facilitate its retrieval (Patton 2002). Deductive analysis then took place, with preliminary structure for themes and sub-categories provided by the behaviours from the observation instrument. Remaining data not categorised in the deductive analysis were then inductively analysed to identify other themes, this was done by grouping the initial descriptive codes into major themes before re-grouping into relevant sub-categories (Patton 2002). Exemplar quotes from the transcripts were provided to illustrate the sub-categories within each theme (Sparkes 1998).

Results

Systematic observation

In total, 3154 minutes of practice time was analysed showing 20,025 recorded behaviours. Uncodable behaviours accounted for 0.3% of total behaviours.

Overall coaching behaviours

****Table 3 near here****

Table 3 shows the behaviour totals and RPM for graduate and non-graduate coaches. Direct management was the most frequent behaviour for both graduate (26.2 ± 4.55%) and non-graduate (25.6 ± 5.51%) coaches. Silence on-task was the next most frequent at 17.6 ± 3.56% for graduate coaches and 14.3 ± 4.09% for non-graduates.

Overall, non-graduate coaches used significantly more of the following behaviours than graduate coaches: specific negative feedback (1.86 ± 0.37% vs 0.76 ± 0.43%), $t(8) = -4.34$, $P<0.01$; general negative feedback (0.62 ± 0.41% vs 0.08 ± 0.08%), $t(4.325) = -2.85$, $P=0.04$; and post-instruction (1.8 ± 0.53% vs 1.1 ± 0.27%), $t(8) = -2.61$, $P=0.03$. They also used those three behaviours at a significantly greater rate per minute (RPM) than graduate coaches: specific negative feedback (0.13 ± 0.04 vs 0.04 ± 0.03), $t(8) = 3.82$, $P<0.01$; general negative feedback (0.04 ± 0.03 vs 0.004 ± 0.005), $t(4.276) = 2.83$, $P=0.04$; and post-instruction (0.13 ± 0.04 vs 0.06 ± 0.02), $t(8) = 3.17$, $P=0.01$.

Graduate coaches used significantly more divergent questioning (6.44 ± 3.57%) than non-graduates (1.84 ± 1.88%), t (8) = 2.55, P=0.03. Furthermore, this was at a significantly higher RPM (0.36 ± 0.17) than non-graduates (0.11 ± 0.97), t (8) = 2.79, P=0.02.

No interaction effect of coach graduate status on balance of pre-, concurrent and post-instruction was found. When examining differences in the secondary detail of timing of instruction, the follow up one-way ANOVA was significant [*f* (2,27) = 83.23, P<0.01]. Results of the post-hoc Tukey revealed that concurrent instruction (9.95 ± 2.79%) was significantly higher than pre- (1.72 ± 0.59%) and post- (1.45 ± 0.54%) (P<0.01) for all coaches.

Looking at the secondary detail of the questioning behaviour, a mixed model ANOVA showed a significant main effect [*f* (1,16) = 49.337, P<0.001]. An interaction effect was also present for coach graduate status [*f* (1,16) = 5.426, P<0.05]. For the post-hoc analysis Bonferroni's adjustment was made to reduce the likelihood of type-1 errors, therefore significance was accepted as p<0.025 (P<0.05/2). Non-graduate coaches asked significantly more convergent (9.32 ± 5.78%) than divergent (1.84 ± 1.89%) questions (P=0.01). However, for graduate coaches there was no significant difference between convergent (8.98 ± 2.02%) and divergent (6.44 ± 3.57%) questioning.

Practice activities

A one-way ANOVA revealed a significant main effect for practice state [*f*(1.13,9.00) = 20.80, p=0.001]. There was no significant interaction effect between coach graduate status and practice states [*f*(1.13,9.00) = 0.47, p=0.859]. Pairwise comparisons from the post-hoc analysis revealed significantly higher percentage of time spent in playing (M = 56.87, SE = 4.28) than training (M = 21.04, SE = 4.47) and other (M = 22.10, SE = 1.27) practice states

for all coaches combined ($p<0.01$). Only one coach used more training form than playing form ('Mike', U18, non-graduate).

Coaching behaviours in different practice states

Practice state did have a significant impact on several behaviours, with regard to differences between training and playing states: mean percentage of positive and negative modelling, specific negative feedback, and pre-instruction were all significantly higher in training than in playing form activities; while silence (on-task) and silence (total) were significantly higher in playing than in training form. Arguably the most notable findings amongst the practice state data are related to questioning and silence behaviours.

A repeated measures ANOVA for divergent questioning showed a significant main effect for practice state [f (2,16) = 15.097, $p<0.001$]. Subsequently, pairwise comparisons situated significantly higher percentages in the 'other' practice state (M = 7.71, SE = 1.26) than in training (M = 2.06, SE = 0.43) and playing (M = 4.04, SE = 1.45) states.

****Figure 1 near here****

Despite the absence of an interaction effect between coach graduate status and practice type for divergent questioning, noting the previously mentioned significant difference between overall levels of divergent questioning for graduate and non-graduate coaches. Figure 1 shows the trend for graduate coaches to ask more divergent questions in all practice states.

A repeated measures ANOVA for silence (on task) demonstrated a significant main effect for practice type [f (2,16) = 96.374, $P<0.001$]. Pairwise comparisons showed significant differences between training (M = 15.12, SE = 1.3), playing (M = 20.91, SE = 1.80), and other (M = 0.71, SE = 0.20) states ($P<0.01$). Whilst no interaction effect was present for

coach graduate status, there was a greater contrast in levels of this behaviour between training and playing activities for coaches with degrees (training = 15.7 ± 4.95% vs playing = 23.1 ± 3.6%) than coaches without (14.5 ± 3.2% vs 18.7 ± 7.2%).

Interview data

After initial line-by-line coding of the interview transcripts at a descriptive level, deductive analysis using behaviour and practice state categories from the observation instrument, along with particular topics from the semi-structured interview guide (e.g. what behaviours do you use and why?), provided preliminary structure for themes and sub-categories. Furthermore, inductive analysis allowed the identification of other themes, resulting in the final structure shown in Table 4. Tables 5 to 8 provide examples from the raw data for each sub-category.

****Table 4 near here****

****Table 5 near here****

****Table 6 near here****

****Table 7 near here****

****Table 8 near here****

Discussion

Overall behaviours

Questioning

Questioning has been identified as a coaching behaviour with the potential to influence athlete learning positively (Chambers and Vickers 2006). Both the graduate (15.4%) and non-graduate group (11.1%) used more questioning than those in Partington and Cushion (2013) (7.8%) and Partington, Cushion and Harvey (2014) (7.2%), though like the coaches in these studies, both groups here asked more convergent than divergent questions. However, while

convergent questioning was significantly higher than divergent for the non-graduate group (9.3% vs 1.8%), for the graduate group (9.0% vs 6.4%) this was not the case. This contrast was also illustrated in the finding that graduate coaches asked significantly more divergent questions. This could be considered important in this context, as it is divergent questions that have the potential to develop decision-making and problem-solving capabilities (Harvey and Light 2015; McNeil et al. 2008), an important aspect of performance for elite players (Williams and Ford 2013).

Both groups suggested that questioning was used as a way of checking understanding, which clearly matches Siedentop's (1991, 233) description of convergent questioning as '…analysis and integration of previously learned material'.

> I'm probably questioning them…in relation to their knowledge to find out if they know. (Rich, U9/10, non-graduate)

However, the higher incidence of convergent questioning for the non-graduate coaches, coupled with their rationale for the use of questioning, suggested a desire to maintain control and exercise informational power over the players (Raven 1993), echoing the findings of previous studies in similar contexts (e.g. Cope et al. 2016; Potrac, Jones and Armour 2002). By asking convergent questions, the coaches not only initiated interactions, but decided what knowledge was important and valued during those interactions (Wright and Forrest 2007):

> Alan (U15/16, non-graduate): Did we get transitions?
> Players (all): Yeah.
> Alan: did the two teams that were together more or less keep about 60% possession would you say?

Players (all): Yeah.

Alan: Yeah and that's always our aim isn't it? 60% possession is about what we're after so that's decent. Did we get goals?

Players (all): Yeah.

Alan: Did we break quickly?

Players (all): Yeah.

Alan: Did we switch?

Players (all): Yeah.

Alan: Did we keep composure?

Players (all): Yeah.

Alan: Did we secure possession?

Players (all): Yeah.

Alan: Yeah well done.

In this way the coach remained the dominant voice and in no danger of being perceived as lacking in knowledge (Cope et al. 2016; Potrac, Jones and Armour 2002). The exchange above also shows that despite questioning often being advocated as 'player centred', players here were treated as a homogenous group, with limited consideration of their individual differences (cf. Cope et al. 2016).

> …to be fair they [players] come up with the right answers. They know it. (Alan, U15/16, non-graduate)

This attitude towards questioning also implied an epistemological view of knowledge as being separate from the knower, existing initially in the mind of the coach before

transmission to players (Potrac and Cassidy 2006). A particular view about the nature of knowledge in soccer is also suggested. This type of questioning and high levels of direction, reflected a belief from the non-graduates that there is a ‘right way’ of doing something (Cushion 2013) in soccer, that there are certain things that must be learned if players are to become professionals (Cushion and Jones 2006).

> …perhaps I need to keep the questions more open…but I suppose the demands on the environment that they’re in now and where they’re at…I’m probably thinking, they’ve gotta start to know this now…
> (Mike, U18, non-graduate)

Going even further, the non-graduate coaches appeared to start to recognise their questioning as a form of instruction:

> My question would be very specific really to get what I want from them. Really I may as well tell ‘em hadn't I? (Alan, U15/16, non-graduate)

This contrasted sharply with the views of coaches in the graduate group, for whom questioning was a means of stimulating higher order thinking and constructing new knowledge (Chow et al. 2009; Kidman and Lombardo 2010; McNeill et al. 2008).

> I try and use questioning…because I want them to reflect on the situations they experience…I think at this level we need to

> challenge and stretch their thinking… (Mark, U11, graduate)

Evidenced in the significantly higher levels of divergent questioning, while four out of five coaches in the graduate group said they used questioning to challenge the players and extend learning, only one coach from the non-graduate group mentioned this. This justification for using questioning coupled with supporting behavioural data has not been reported in previous studies of coaches in similar contexts (e.g. Partington and Cushion 2013; Partington, Cushion and Harvey 2014).

Silence

Silence on-task was the second most frequent individual behaviour category for graduate (17.6%) and non-graduate (14.3%) coaches. This was higher than Cushion and Jones (2001) (10.5%), Partington and Cushion (2013) (6.5%) and the range reported for coaches of different age groups by Partington, Cushion and Harvey (2014) (3.7-8.4%), but lower than the range for three different age groups (18-34%) in Ford, Yates and Williams (2010). The prominent use of silence by the coaches in the present study may reflect the fact that unlike those in Partington, Cushion and Harvey (2014), it was described as a deliberate coaching strategy - though again differences were apparent between the graduate and non-graduate coaches.

Coaches from both groups justified silence as being used for observation (Miller 1992):

> Interviewer: …what's the purpose of you being silent in your sessions?
>
> Dave: To observe. To make sure when you do go in, you coach

> something that's real as opposed to…it just being based on what you want to do." (Dave, U11, graduate)

> …when I'm silent I'm watching…their actions, whether they've got to grips with and doing things that I want to see… and just watching for any opportunity to step in and highlight anything I feel [a] need to… (Mike, U18, non-graduate)

In the context of previous research (Partington and Cushion 2013; Partington, Cushion and Harvey 2014), the fact that coaches gave a reason for their silence could be seen as positive. However, further to this, four out of the five graduate coaches also saw silence as a means of facilitating player learning.

> …to let them make their decisions so I'm not telling or trying not to tell them the answers. (Dean, U13, graduate)

This justification echoes that given by the graduate coaches in Smith and Cushion (2006) study. Also, Partington, Cushion and Harvey (2014) noted that coaches with teaching qualifications discussed giving a chance for players to learn by doing suggesting that graduate coaches implemented a 'more "hands-off" and less prescriptive' (Cushion, Ford and Williams 2012, 1638) approach.

Notably, silence was viewed negatively by the non-graduate coaches as it related to a perceived loss of control, reflecting a desire to remain at the 'centre' of the session, taking responsibility for decisions (cf. Potrac, Jones and Armour 2002).

> I feel if I'm coaching a session and I sit back and observe for even two minutes…I personally feel the session's getting away from me…I feel like I've lost control of the session. So silence for me as a coach, I'm not saying it's right or wrong, but for me it's uncomfortable.
> (Sean, U14, non-graduate)

Instruction and Management

In place of silence, instruction and management were a means to maintain control of the session, indeed direct management was the most frequent behaviour for both graduate (26.2%) and non-graduate (25.6%) coaches. Aside from disseminating the organisation of practices, management often involved keeping score, counting passes towards a target numbers, and indicating whose restart it was (Cushion et al. 2012). Several coaches (2/5 graduates, 4/5 non-graduates) saw this, along with concurrent instruction, as a means of raising or maintaining the intensity of the session. Skill acquisition theory suggests that this directive approach, whilst not conducive to long-term learning, would result in short-term performance improvements (Williams and Hodges 2005). Accordingly, instructional behaviour is reinforced and reproduced, as the coaches see immediate benefits and the players become increasingly socialised into playing a passive role (Potrac, Jones and Cushion 2007).

Non-graduates referenced previous experience as players or coaches as the source of such behaviours, rather than evidence-based theory (Cushion, Ford and Williams 2012):

> It is a method of keeping a high tempo. And probably it's true to the way I've been brought through.
> (Alan, U15/16, non-graduate)

> It would be because every coach I've played under did it themselves. (Sean, U14, non-graduate)

This appears to be evidence of the uncritical reproduction of previous experiences, where perceptions about effective practice and the coaching role are formed as players and implemented on becoming a coach (Jones, Armour and Potrac 2004; Townsend and Cushion 2015).

Practice activities

Along with high levels of instructional behaviours, previous research has shown a prevalence of 'training form' activities, a traditional approach to practice characterised by the use of isolated technique or skill work (Ford, Yates and Williams 2010; Partington and Cushion 2013; Partington, Cushion and Harvey 2014). However, evidence from the present study showed coaches used more playing form (56%) than training form (22%) activities. The 'other' practice state (22%), made up the remaining session time. There were no significant differences found between the graduate and non-graduate coaches on this.

Playing form activities were used due to their similarity to competition, a justification supported by scientific theory on skill acquisition, which suggests that long-term learning is facilitated by variable, random practice, such as that created by small-sided games (Ford and Williams 2013; Schmidt and Lee 2005; Williams and Hodges 2005). Given that a key

concern of coaching in these elite developmental contexts is to prepare players for careers in professional soccer, it follows that practice activities should result in "…retained improved performance in match-play" (Ford and Whelan, 2016, 112).

> I'd rather see the small sided game… the main reason would be to develop their game understanding and for players to be comfortable, opposed rather than unopposed… in a game a lot of things happen, a lot of things are around you, opponents, team mates, decisions influence a lot of what you're doing, on and off the ball. (John, U9/10, graduate)

The balance in favour of playing form activities suggests that at least part of the theory-practice gap recently identified in the literature (Cushion, Ford and Williams 2012; Ford, Yates and Williams 2010) did not appear to be present in these groups of coaches. However, in providing a rationale for the use of training form activities, reasons tended to contradict scientific theory. Training form was largely seen as something for developing technique, which for short term performance may be accurate, but the idea that these improvements would transfer into games was misguided (Cushion, Ford and Williams 2012).

> Basically the repetitional thing is basically being able to pass from A to B, doing it over and over and over and over and over again, trying to reduce the mistakes, hoping that when they go into a small sided game, or a small possession game that they become better at it…I'm a great believer [in that],

> I've always done it… (Mike, U18, non-graduate)

There is an indication here, that rather than an explanation based around skill acquisition theory, the use of drill-type activities is justified as an approach learned and reinforced through experience, in much the same way as explicit instruction (Ford, Yates and Williams 2010; Potrac, Jones and Cushion 2007).

At twenty-two percent of session duration, time spent in the 'other' practice state was comparable with findings on three team coaches in other sports (16-24%, Harvey et al. 2013). This clearly comprised a significant part of training sessions, which several coaches looked upon as wasted time. However, there were coaches, all graduates, who saw the potential for learning to take place in this 'other' state:

> If it was just drinking and not doing something that's related to the training, probably needs to come down but if it's related to their group discussions and choosing formations and discussing the topic then that number probably wouldn't be as bad…(Dean, U13, graduates)

The coaching behaviours employed during time spent in the 'other' state can provide some indication of the nature of interactions therein.

Change in behaviour by practice state

Both convergent and divergent questioning comprised a significantly higher percentage of behaviours in the 'other' practice state, than in training or playing activities. As previously stated, some graduate coaches seemed to recognise the potential for learning in 'other', while

non-graduate coaches tended to see this state as wasted time.

> …we also used that time to use…peer assessment, plenty of group discussions and so on. (Mark, U11, graduate)

Although it was found that only one out of three coaches in Harvey et al. (2013) utilised such periods to engage in discussions, it was suggested that 'far from being time off task…it could be argued that such a state incorporated some crucial facets of coaching' (25).

Indeed, for graduate coaches, convergent (16.2%) and divergent (10.8%) questioning was second only to management (25.9%) in their frequency in the 'other' state. Whilst this should not be seen as a recommendation that more time be spent in this state, it does appear to indicate that in this case graduate coaches made more effective use of this time. They did this by consciously incorporating behaviours which are associated with player learning (McNeill et al. 2008; Metzler 2011).

Silence on task was significantly higher in playing (20.9%) than training form (15.1%). As an example, 'Andy' predicted this, he showed less concurrent instruction (10.3% vs 24.9%) and more silence (18.9% vs 10.5%) in playing than training form.

> I think they change in that perhaps, I'm on top of the players a bit more in the technical side because I'll try to walk around to give individual feedback or group feedback and then in the game…I'm very consciously aware of trying to ensure that in the game, you've just got to let them have a go. So I try to use more silence in the game than there would be perhaps, in the technical or skills practice.

(Andy, U14, graduate)

This self-awareness was not evident in all of the coaches, and non-graduate coaches tended to be less accurate in their perceptions, as shown in the prediction and subsequent reaction below:

> In playing state I would have a lot more driving the session, a lot more instruction. It would definitely differ.

> This is really interesting. I'm silent in the playing state a lot more than in the training state. That's blown me away. So I'm a lot more vocal in the training state. (Sean, U14, non-graduate)

As hinted at by these excerpts, there was also a trend towards reduced instruction in playing form activities, although this was non-significant. These findings support the idea that playing form activities may result in less prescriptive behaviours, though like the coaches in previous studies, the non-graduate group were largely unable to predict or explain the change (Partington and Cushion 2013).

Influence on behaviour

Whilst it was not the aim of this study to explore coaches' educational experiences in depth, the interviews did provide some indication of the ways in which tertiary level education had influenced the practice of the graduate coaches. It appeared that university challenged coaches' conceptions of the coaching role:

> … when I started coaching, I was very much a coach that just copied someone I had as a coach, and when I was in the system [as a player] the methods were completely different. It was command all the time…it was very authoritative. So, when I went to university, my lecturer taught me about the importance of giving the players ownership, asking higher order open questions to promote their thinking and also about guided discovery and whole-part-whole. (Mark, U11, graduate)

Graduate coaches described the examples provided by lecturing staff as a stimulus for their own practice. However, rather than uncritically reproducing their approach, they developed ideas and skills through collaboration with both course staff and other students (Turner and Nelson 2009).

> …certainly with the lecturers and a good cohort [of students], you didn't just pinch something, it was more pinch something and add something, expand on it rather than just nicking an idea for an ideas sake. (John, U9/10, graduate)

So, by questioning the dominant conception of coaching as coach-centred and explicitly directive and providing an environment where knowledge and skills were developed, practiced, and critically discussed, tertiary education seemed to have resulted in graduate coaches with an altered view of 'how' to coach and coherent rationales for why they do so.

This contrasted sharply with the coaches' attitudes towards soccer-specific coaching courses, which were seen to be about the acquisition of specific knowledge (Jones 2007) and the reproduction of an authoritarian coach-centred practice (Chesterfield, Potrac and Jones 2010).

> I think a lot of it was language. Being able to say the specific things that you want to put across. (Gary, U14/15, non-graduate)

> It was directing the games and being loud and making sure people stood still, and controlling what happened. (Rich, U9/10, non-graduate)

It appears that the focus on 'what' to coach, along with strict definitions of 'how' to coach, has led to non-graduates who are less able to explain and justify their coaching behaviours. Without the input of the university course, it appeared that for these coaches the influence of previous experience from playing and coaching was pervasive, as their practice remained implicit and unquestioned (Cushion, Ford and Williams 2012; Cushion and Jones 2006). All of the coaches mentioned previous coaches, several of whom had influenced them in both positive and negative ways.

> When I went to the club full time, I really didn't understand what it was or what was needed for apprentices to make it as pros. So I copied the behaviour of the other coaches and I copied their methods…There was a very strict discipline and sometimes berating culture. I was thinking is that the way, is

> that what I should be doing?…bearing in mind I was coming in, not as an ex-pro, so I had to earn respect fairly quickly and so I did copy certain behaviours and behaved in a certain way and spent a lot of time, probably not being the person I was.
> (Alan, U15/16, non-graduate)

This matches the ‘heavily authoritarian’ (Cushion and Jones 2006, 148) behaviour observed during an ethnography of a similar context at another professional club, with Alan’s justification here of needing to 'earn respect’ a clear reiteration of earlier research findings (Potrac, Jones and Armour 2002).

Conclusions

Systematic observation revealed significant differences in coaching behaviour between graduate and non-graduate coaches. Arguably most notable of these was the finding that graduate coaches asked significantly more divergent questions than non-graduates. This behaviour has been identified as having the potential to facilitate higher order, critical thinking and decision-making skills (McNeill et al. 2008; Siedentop 1991), yet incidence of divergent questioning in such contexts had previously been found to be infrequent in comparison to explicit instructional behaviours (Partington and Cushion 2013; Partington, Cushion and Harvey 2014). Tertiary level study was reported to have helped the graduate coaches challenge the traditional conception of coaching as directive and coach-centred, resulting in a practice more closely aligned with current conceptions of player learning.

In addition to this important difference in behaviour, insights from the interpretive interviews showed evidence of a difference in coaches’ levels of self-awareness. Existing research had suggested that coaches are poor at describing their behaviours (Harvey et al.

2013; Partington and Cushion 2013; Partington et al. 2015; Partington, Cushion and Harvey 2014). In the present study, it was clear that coaches were able to identify key aspects of their practice, however, evidence indicated that graduate coaches were more accurate at predicting their most frequent behaviours. This also meant that when providing a rationale for their actions, the justifications of graduate coaches centred on facilitation of player learning which largely matched their actual practice, rather than an idealised version (Cushion 2010).

With regard to practice activities, in contrast to previous research (Ford, Yates and Williams 2010; Partington and Cushion 2013; Partington, Cushion and Harvey 2014), sessions featured a higher proportion of playing form than training form activities. Furthermore, at over twenty percent of session time, the 'other' practice state was a prominent part of contact time with the players in this context. For some coaches, this was an unconsidered part of practice (Harvey et al. 2013) and seen as wasted time, however, graduate coaches identified this as an opportunity for group discussion and social interaction. Observation data supported this showing significantly higher percentages of questioning in 'other' when compared with training and playing form.

Like Cushion and Jones (2001), generalisability of findings is limited by the difficulty in such elite developmental contexts of controlling for variables which may impact on results. Firstly, contextual factors with the potential to influence behaviour - within sessions these often related to players, their attendance and movement between age groups (Morgan, Muir and Abraham 2014). Secondly, in seeking to make a meaningful comparison of graduate and non-graduate coaches, it was impossible to have perfectly comparable samples in terms of the age groups coached. This may have influenced the behaviours used by the coaches, though existing studies have reported contradictory findings relating to this (Ford, Yates and Williams 2010; Partington, Cushion and Harvey 2014).

Overall, this study showed significant differences in behaviour between graduate and non-graduate coaches, the fact that divergent questioning was one of these is worthy of note in relation to this youth development context. While non-graduate coaches struggled to predict and justify their behaviours, coaches in the graduate group generally provided more accurate predictions and theoretically sound rationales for their actions. This included the use of silence not just for observation, but to allow player decision making; and questioning not just to check knowledge, but also to extend critical thinking and decision-making skills – highly relevant to developing elite performers in soccer.

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Table 1 - Coaches' biography.

Coach (pseu-donym)	Age group coached	Coaching experience (total)	Coaching experience (Academy/ CoE)	Graduate	Coaching qual.	Playing experience
John	U9/10	8	4	Yes	UEFA B	Semi-professional
Dave	U11	13	10	Yes	UEFA B	Semi-professional
Mark	U11	11	7	Yes	UEFA B	Semi-professional
Dean	U12/13	15	7	Yes	UEFA B	Semi-professional
Andy	U14/15	14	10	Yes	UEFA B	Semi-professional
Rich	U9/10	20	2	No	UEFA B	Semi-professional
Sean	U14	2	2	No	UEFA A	Professional
Gary	U14/15	6	3	No	UEFA B	Semi-professional
Alan	U15/16	21	20	No	UEFA B	Semi-professional
Mike	U17/18	20	10	No	UEFA A	Professional

Table 2 – CAIS behaviour definitions (Cushion et al. 2012)

Primary coaching behaviour	Description
Positive modelling	Skill demonstration – with or without verbal instruction that shows the performer the correct way to perform.
Negative modeling	Skill demonstration – with or without verbal instruction that shows the performer the incorrect way to perform.
Specific feedback (positive or negative)	Specific verbal statements (either positive or supportive OR negative or unsupportive) that specifically aim to provide information about the quality of performance.
General feedback (positive or negative)	General verbal statements OR non-verbal gestures (either positive or supportive OR negative or unsupportive (can be delivered concurrently or post).
Corrective feedback	Corrective statements that contain information that specifically aim to improve the player(s) performance at the next skill attempt.
Instruction	Verbal cues, reminders or prompts to instruct / direct skill or play related to player(s) performance.
Humour	Jokes or content designed to make players laugh or smile.
Hustle	Verbal statements or gestures linked to effort to activate or intensify previously directed behaviour.
Praise	Positive or supportive verbal statements or non-verbal gestures which demonstrate 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.
Punishment	Specific punishment following a mistake.
Scold	Negative or unsupportive verbal statements or non-verbal gestures demonstrating displeasure at a player(s) that DO NOT specifically aim to improve the player(s) performance at the next skill attempt.
Uncodable	Not clearly seen or heard, not belonging to any other category.
Silence	Coach is silent this can be on-or off-task. (See secondary questioning behaviours below for definitions of on-and off-task).
Question	Coach asks a question about skill, strategy, procedure or score, the status of a player's injury, about the welfare of a player, etc. (see secondary questioning behaviours below for specific examples).
Response to question	Coach responds to a question that may or may not be directly be related to practice.

Management – Direct	Management that is practice/match competition-related coach behaviour contributing directly to practice/match competition or explaining how to execute the skill, drill or game.
Management – Indirect	Management that is practice-related coach behaviour, not contributing directly to practice/the match competition.
Management – Criticisms	Management that demonstrates displeasure at the player(s) behaviour or match official's decisions.
Confer with assistants	Coach confers with assistants to talk about, manage or reflect on anything concerned with the practice.

Secondary detail of behaviour (timing)

Timing	Description
Pre	Information given before a performance episode.
Concurrent	Information given during a performance episode.
Post	Information given after a performance episode.

Secondary detail of behaviour (questioning and silence)

Questioning	Description
Convergent	Limited number of correct answers/options – closed responses (i.e. often yes or no answer).
Divergent	Multiple responses/options – open to various responses.
Silence	Description
Silence on-task	Coach monitors practices without reacting verbally or non-verbally.
Silence off-task	Coach is not visibly engaged in the practice.

Table 3 - Total behaviours used by graduate and non-graduate coaches [total behaviours, percentage of behaviours (mean), standard deviation (SD) and rate per minute (RPM)].

	Graduate coaches				Non-graduate coaches			
Behaviour	Total	%	SD	RPM	Total	%	SD	RPM
Pos. modelling	154	1.4	0.49	0.09	144	1.3	0.89	0.09
Neg. modelling	29	0.3	0.23	0.02	47	0.4	0.35	0.03
Spec. pos. feedback	435	4.6	1.89	0.26	402	4.0	1.88	0.29
Spec. neg. feedback	79	0.8[a]	0.42	0.05[a]	185	1.9[a]	0.36	0.13[a]
Gen. pos. feedback	644	6.6	2.27	0.38	1032	10.5	6.25	0.79
Gen. neg. feedback	9	0.1[a]	0.09	0.00[a]	62	0.6[a]	0.42	0.04[a]
Corrective feedback	168	1.5	0.93	0.09	152	1.4	1.16	0.10
Instruction (pre)	147	1.4[b]	0.41	0.08	209	2.0[b]	0.65	0.14
Instruction (conc.)	1057	9.6[b]	3.80	0.59	1000	10.3[b]	1.60	0.73
Instruction (post)	111	1.1[a,b]	0.27	0.07[a]	176	1.8[a,b]	0.52	0.13[a]
Instruction (total)	1312	12.1	4.09	0.73	1385	14.1	1.32	0.99
Humour	96	0.9	0.52	0.05	76	0.7	0.24	0.05
Hustle	103	0.9	0.51	0.06	157	1.6	0.93	0.12
Praise	24	0.2	0.15	0.01	56	0.6	0.33	0.04
Punishment	0	0.0	0.00	0.00	17	0.2	0.18	0.01
Scold	2	0.0	0.03	0.00	9	0.1	0.08	0.01
Uncodable	20	0.2	0.17	0.01	37	0.4	0.24	0.03
Silence (on task)	1781	17.6	3.56	1.03	1418	14.3	4.09	0.96
Silence (off task)	182	1.9	0.50	0.11	207	2.1	0.37	0.15
Silence (total)	1963	19.5	3.76	1.14	1624	16.4	4.00	1.11
Question – converg.	926	9.0	2.02	0.53	906	9.3[c]	5.79	0.61
Question – diverg.	586	6.4[a]	3.57	0.36[a]	178	1.8[a,c]	1.87	0.11[a]
Question (total)	1510	15.4	4.46	0.88	1083	11.1	7.63	0.72
Response to quest.	351	3.5	0.85	0.20	282	3.1	2.22	0.21
Management – Dir.	2694	26.2	4.55	1.55	2520	25.6	5.51	1.77
Management – Ind.	182	1.8	0.24	0.11	158	1.7	0.91	0.12
Management – Crit.	27	0.3	0.13	0.01	42	0.4	0.48	0.03
Conf. with assistant	382	3.7	2.19	0.22	364	3.6	2.69	0.26
Total	10189	100		5.88	9836	100		6.93

Note: [a] Significant difference between graduate and non-graduate group in independent t-tests.
[b] Significant difference between concurrent instruction and pre-/post-instruction.
[c] Significant difference between convergent and divergent questioning.

Table 4 - Major themes and subcategories identified from the deductive and inductive analyses.

Themes	Sub-categories
Use of specific behaviours	Questioning to check understanding and extend learning; silence for observation and to let them play; instruction to increase intensity.
Practice activities	Playing form for decision making; training form for technique; 'other' as wasted time; 'other' as learning.
Change in behaviour by practice type	Silence in playing form; evidence of self-awareness; lack of self-awareness
Influences on behaviour	Academic education; Soccer-specific qualifications; previous coaches.

Table 5 - Sub-categories and raw data examples for the use of specific behaviours theme.

Theme	Sub-categories (no. of coaches from graduate group, no. of coaches from non-graduate group)	Raw data examples (coach, age-group, graduate-status)
Use of specific behaviours	Questioning to check understanding (4,3)	'…understanding, to see whether they understand what we're talking about and see whether they're listening, there's obviously some boys they switch off...' (Mike, U18, non-graduate)
	Questioning to extend learning (4,1)	'…if I see at that moment in time that individual is really confident, he understands what's expected, then I'll challenge him…ask him a high order question that will really promote his thinking.' (Mark, U11, graduate)
	Silence for observation (4,4)	'…observation for those two purposes: is it working? Who needs what?' (Dave, U11, graduate)
	Silence to let them play (4,2)	'…to let them make their decisions so I'm not telling or trying not to tell them the answers.' (Dean, U13, graduate)
	Instruction to increase intensity (2,4)	'There may be times, let's say the first few minutes, I might use command to get the intensity up.' (Mark, U11, graduate)

Table 6 - Sub-categories and raw data examples for the practice activities theme.

Theme	Sub-categories (no. of coaches from graduate group, no. of coaches from non-graduate group)	Raw data examples (coach, age-group, graduate-status)
Practice activities	Playing form because it is realistic to the game (4,2)	'I don't think you can have any other practices which are more like a game than small sided games, where they're gonna be challenged by playing against another team.' (Rich, U9/10, non-graduate)
	Training form for technique (3,2)	'…you might take two or three players out that are really struggling with a particular technique and work on that…' (Dean, U13, graduate)
	'Other' as wasted time (2,3)	'…there's a lot of contact time lost there.' (Andy, U14, graduate)
	'Other' as learning (3,0)	'In terms of going for a drink, having discussions, using methods to help with their social interaction. (Mark, U11, graduate)

Table 7 - Sub-categories and raw data examples for the change in behaviour by practice type theme.

Theme	Sub-categories (no. of coaches from graduate group, no. of coaches from non-graduate group)	Raw data examples (coach, age-group, graduate-status)
Change in behaviour by practice type	Increased silence in playing form (3,2)	'…the reason I'm guessing, I'm more silent in a playing state, would be observing what's going on, the bigger picture. I'm not looking at an individual or skill, I'm not looking at one player at a time, I'm now, it might take me five, six, seven, eight seconds to scan the pitch to see patterns, to see shapes, to see habits of players, to see the movements they're making and so on and so forth. So that I think, and it's obviously a bigger area as well. So if I'm scanning a bigger area, it's going to take longer.' (Sean, U14, non-graduate)
	Evidence of self-awareness (4,2)	'If I was to do a technical practice…it would be probably more command.' (Mark, U11, graduate) 'It appears in the game, as I said, I don't provide as many instructions. But that was expected… Obviously in the games I'm not talking as much … and that's expected as well. In the training exercises I do talk a lot more. Coach a lot more.' (Mark, U11, graduate)
	Lack of self-awareness (2,4)	'…the big thing that stands out is the disparity between convergent and divergent questioning, which has completely surprised me.' (Gary, U14/15, non-graduate)

Table 8 - Sub-categories and raw data examples for the influences on behaviour theme.

Theme	Sub-categories (no. of coaches from graduate group, no. of coaches from non-graduate group)	Raw data examples (coach, age-group, graduate-status)
Influences on behaviour	Academic education (4,0)	'When I started my degree, I learnt more about giving the players ownership. [Before that] I was very much a coach that just copied someone I had as a coach.' (Mark, U11, graduate)
	Soccer-specific qualifications (5,5)	'I think the Youth Module Three was the most important for me…making things specific to the player and the action review process of going in, giving the player a challenge or asking a question and then seeing whether he's taken it on board.' (John, U9/10, graduate)
	Previous coaches (4,5)	'…there's a few people yeah, [name of previous coach] was one that I really respected as a young coach, because of the way he demonstrated, he was a very good demonstrator of what he wanted…when he did it I used to think "wow".' (Mike, U18, non-graduate)

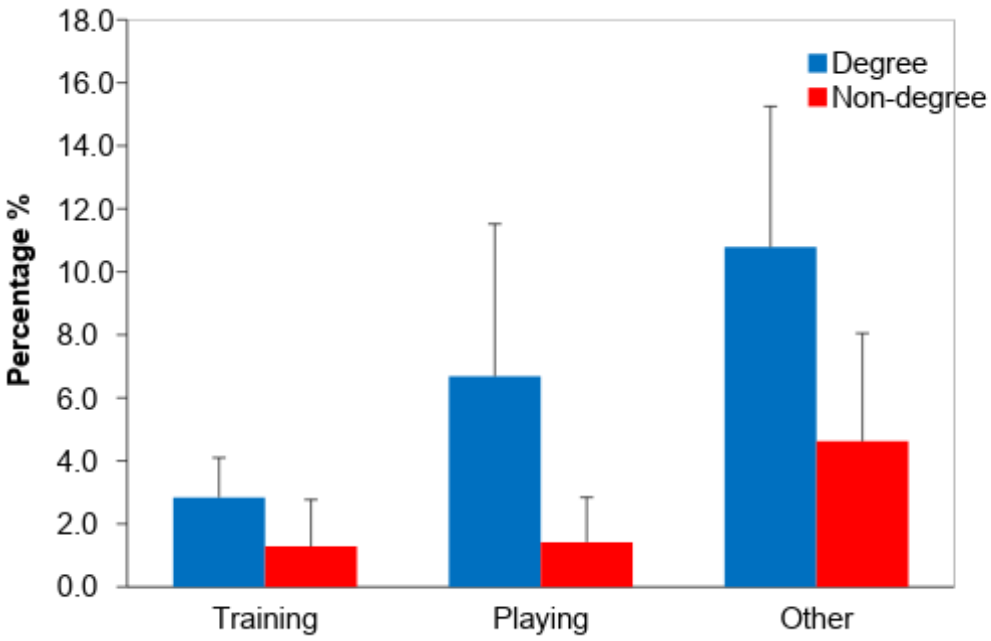

Figure 1 - Divergent questioning percentage of total behaviours as a function of practice state.