Understanding Coaching As A Judgement and Decision Making Process: Implications For Coach Development Practice.

By

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DECLARATION

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ABSTRACT

In completing this thesis I am interested in two broad questions; what is coaching and how do we develop it? Surprisingly after nearly forty years of coaching research there is no agreed answer to these questions in the literature. This is perhaps not that surprising since other more established roles such as teaching are still struggling with answering this sort of ontological question after many more years of research. Despite this struggle, I focus my attention on applying the theory of Professional Judgement and Decision Making (PJDM) to understanding what coaching is and what the implications are for coach development. In taking this approach and seeking answers to the broad questions I present five substantive chapters, two of which are critical desk top studies, the other three being empirical studies. These are wrapped in introduction (Chapter 1) and conclusion (Chapter 7) chapters. Chapter 2 presents what PJDM is and how it can work as a parsimonious theory to draw in current coaching literature to understand what coaching is and how it can work. Chapter 3 presents data from long jump coaches that suggests that coaches are capable of engaging and do engage in PJDM but only when pressured to do so. Prior to this, the coaches preferred to take more of a folk, experiential, gut feeling approach to solving a contextualised coaching problem. Building from Chapter 3, Chapter 4 identifies how individual differences in how coaches view knowledge and learning can explain their willingness to engage in PJDM and aligned formal coach development activities. More specifically, that coaches with a dualistic view on learning and knowledge will shy away from or even disrupt coach development that confuses their view on the world. Alternatively, coaches with a more relativistic view will actively seek out new knowledge to improve their understanding of coaching and athlete development. Drawing on the findings of the thesis to this point Chapter 5 identifies that to improve coaches' willingness and capacity to engage in PJDM the biggest impact must come from formal coach education. As such Chapter 5 offers a summary of a broad range of empirical and theoretical research and how an aligned application of this research can lead to more impactful formal coach development. Chapter 6, builds from Chapter 5 by noting that more impactful formal coach development will require more professional coach developers. As such, in this chapter I define what a high performing coach developer should know and be capable of. This definition was subsequently used to develop of Postgraduate Certificate in Coach Education for The Football Association. To conclude therefore, I deliver answers to the two broad questions set at the beginning of the thesis. Firstly and briefly, coaching is a PJDM process that draws on formal, theoretical knowledge to solve coaching problems and make decisions leading to the achievement of goals. Secondly, that to develop coaches capable of PJDM, coach development

must practice what it preaches and engage in creating development programmes that are supported by theoretical and empirical research relating to programme development, adult learning, curriculum building and individual differences.

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Thanks to my mum Sheila and dad Ron for their lifelong support. It is sad that my dad isn't here to witness this work. However, it makes me proud to be able to present this to my mum. Her unwavering support is deserving of so much more than this small acknowledgement.

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CHAPTER 1 INTRODUCTION

1.1 OVERVIEW TO THE THESIS

This thesis is interested in two broad questions; what is coaching and how do we develop it? Surprisingly after nearly forty years of coaching research there is no agreed answer to these questions in the literature. This is perhaps not that surprising since other more established roles such as teaching are still struggling with answering this sort of ontological question after many more years of research. However, despite the lack of answers coaching is something that happens every day all over the world. Furthermore, some attempts have been made to create definitions as identified below:

> a process of guided improvement and development in a single sport and at identifiable stages of athlete development. (Petry, Froberg, & Madella, 2006, p.72)

> coordinated activity within set parameters expressed by coaches to instigate, plan, organize, monitor, and respond to evolving circumstances . . . (Jones & Wallace, 2006, p.61)

> The consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in specific coaching contexts. (Côté & Gilbert, 2009, p.316).

> … a coaching process can be viewed as an on-going series of goal-related problem solving and DM [decision making] that can occur on a macro, meso and micro level. (Abraham & Collins, 2011, p.211)

Despite the lack of obvious consensus in these definitions there is a common theme of coaching being a 'process' throughout each definition. It is in this space of coaching being a *process* that I focus my attention on within this thesis. More specifically I apply the concept of Professional Judgement and Decision Making (PJDM) (Martindale & Collins, 2005) to both developing a view to the ontological questions posed and an epistemological approach to methodology design to gain insights and answers to the questions presented. In order to achieve this goal I have completed five chapters (Chapters 2 – 6) that explore differing aspects of the questions posed. Of these chapters two have been published in academic journals (Chapters 2 and 4) and Chapter 6 has been presented at an international conference and written as the

professional report for The Football Association. Chapter 3 has been accepted for presentation at an international conference for presentation in June 2015.

1.2 CHAPTER 2 OVERVIEW

Chapter 2 is a desktop study that sets the scene for the rest of the thesis. The goals of this study are to display how PJDM can be used as a unifying theory to make sense of the three identified philosophically different views on coaching; pedagogical, sociological and political. Rather than seeing difference in these views, PJDM takes the view that they can be used to inform judgement and decisions to achieve coaching objectives.

To bring definition to PJDM I introduce two broad views on decision making that seem to define how humans can operate. The first is *Classical Decision Making* (CDM), a slow, effortful and thoughtful approach to making judgements and decisions. The second is *Naturalistic Decision Making* (NDM) a faster, more economical and intuitive approach to making judgements and decisions. Both approaches are identified as having pros and cons to their use.

As a pro, CDM allows for more thorough holistic and interdisciplinary judgements and decisions to be made in order to achieve set goals. The con is that this approach can be so slow and effortful it does not transfer well to time limited or pressured situations. It is in these situations that the pro of NDM becomes a useful approach since the process is quicker –but only if the decision maker is sufficiently knowledgeable and experienced within the context. The con of this process is that it often becomes the go to method even when more time is available which can lead to poor as opposed to optimal decisions being made.

To conclude this chapter I offer a unifying concept reflective of PJDM called *nested decision making*. This is a process that promotes the pros of both CDM and NDM. The concept identifies that when fast naturalistic decisions are required they should be nested within ideas created through thoughtful classical decisions.

1.3 CHAPTER 3 OVERIVEW

Chapter 3 is an empirically based chapter. Using PJDM as its theoretical basis this study aims to examine the processes that coaches actually use when placed in a decision making situation.

In setting this study up, further definition on decision making is offered. Firstly a view is offered on what type of knowledge is drawn upon in making judgements and decisions.

A distinction is offered between judgements that are based on either *formalistic* or *substantive* rules and knowledge. Formalistic judgements draw on knowledge and/or rules that are formal and typically theoretical in nature. Substantive judgements are more bound in subjective experience that is potentially less valid because of its uncritical folklore basis.

Further to this distinction a theoretically linked NDM concept of *Recognition Primed Decision Making* (RPD) is introduced. This sub theory provides further theoretical detail on how humans connect decisions to perceived environmental information to make fast naturalistic decisions. It identifies that fast decisions can be totally intuitive with little conscious effort. Additionally, if there is some uncertainty with the intuitive response, rules/heuristics are applied to further (i.e. beyond intuitive perception) diagnose the situation being perceived. Alternatively, even if the situation is recognised, the rule/heuristics are applied when an intuitive course of action is not forthcoming or is rejected as not being applicable in order to further evaluate a course of action.

This additional theoretical analysis provides a view that a middle ground exists between CDM and NDM that, while fast, engages some level of thought. Furthermore, that where thought is involved, in CDM or RPD, this thought could be either formalistic or substantive.

Against this premise twelve long jump coaches were asked to identify the strength and weaknesses of a long jump athlete and offer a view on how they would work with the athlete. In order to produce some uncertainty all coaches were then asked to identify what they would do if their first approach didn't work.

Findings suggest that coaches have an initial wish to engage in RPD type behaviour but drawing mainly on substantive heuristics. Uncertainty pushed coaches to become more considered, and formalistic. In conclusion, coaches have the capacity to be professional in their DM behaviour but may not use this capacity unless pushed to.

1.4 CHAPTER 4 OVERVIEW

Chapter 4 is an empirical chapter. This chapter begins to explore the issue of developing coaches who are able to engage in PJDM. Drawing on the finding from Chapter 3 that not all decisions made by the coaches involved were as professional as they could be *and* that two coaches dropped out of the study, this study investigates if all coaches are as willing or able to engage in professional development as each other.

This chapter draws on theoretical concepts of how adult learners change their views of what knowledge and learning are. The hypothesis of this chapter is that those who

struggle to adapt to seeing knowledge and learning from more relativistic points of view will also struggle to cope when coaching becomes more complex. Furthermore, there will be some coaches who progress into senior coaching positions in spite of this failing.

Data is drawn from anonymised staff development records and third party reviews the staff development behaviour of 19 high performing coaches. Based on data collected, 9 coaches were identified as being *vampires*, coaches who would literally suck the life out of staff development sessions, suggesting that the sessions were overcomplicating coaching. 6 Coaches were identified as *wolves*, those who were voracious in their appetite for new ideas and staying ahead of the opposition.

The findings of this study are interpreted as being evidence for the need to account for individual differences in the design and delivery of formal coach development. Furthermore, that despite the best intentions of coach education vampires will emerge despite these systems. As such creating cultures that deliberately challenge all coaches to be publically clear about their intentions and rationale can offset some of the problems of having vampires in the system.

1.5 CHAPTER 5 OVERVIEW

Chapter 5 is desktop study. Chapters 2 – 4 are focused on coaches, moving from a view of what coaching is in Chapter 2, examination of coaching as a PJDM process in Chapter 3, to a view of how individual characteristics of coaches can impact on their capacity to be professional coaches in Chapter 4. In short, while PJDM fits as a inclusive theory, not all coaches are engaging in PJDM. As such Chapter 5 begins with the view that the most impactful approach to improving coaching would be to improve formal coach development. Furthermore, that such an approach should practice what it preaches and take a PJDM view on improving coach development.

Against this view, this chapter introduces a number of formal rules and associated research and theory that should guide professional judgements and decisions about creating formal coach development programmes.

Initially, two formal concepts are introduced, the first is the concept of constructive alignment (Biggs, 1996). This concept proposes five stages of programme design that should align and relate to each other. Furthermore, that all five stages should be underpinned by robust research informed judgements. The second concept is the coach development decision making model (Abraham, Muir, & Morgan, 2010) that

identifies five broad domains of knowledge that should guide judgements and decisions in coach development:

- Goal setting.
- Understand the coach.
- Understand curriculum content and design.
- Understand adult learning and assessment.
- Understand the context.

Subsequently these two concepts are used to guide the content of the remainder of the chapter. To delimit the scope of the chapter I deliberately focus on developing professional coaches as opposed to voluntary coaches. Building on this delimitation I offer a view of what a professional coach 'looks like' from a knowledge and skills point of view, essentially setting the broad decontextualized goals for formal professional development programmes.

From this position I go on to review research relevant to; understanding the coach, curriculum content and design, adult learning and assessment, and the context. In each of these areas I identify issues and/or concepts that have direct implications for the design, delivery and assessment of formal coach development.

Finally, I conclude with a view on what the characteristics of effective coach development course would be.

1.6 CHAPTER 6 OVERVIEW

Chapter 6 is an empirical chapter. Drawing on the recommendations of Chapter 5, the aim of this chapter is to examine the demands of and skills required to be a high performing coach educator capable of developing professional coaches. This participant group is chosen since impactful coach development will be dependent on there being high quality and impactful coach developers.

There is currently little research examining what coach educators do. Subsequently there is also little is known as to what professional knowledge and skills are needed by coach educators in or to develop coaches capable of PJDM. Consequently, to explore this gap in the understanding, the practice of three groups of high-level coach educators are analysed using the *Applied Cognitive Task Analysis* (ACTA) methodology.

A total of 16 coach developer professionals were engaged in data collection. Data was collected through one or more of; interview, observation in one to one sessions or observation in workshop settings.

Using the core concepts identified and developed in Chapter 5 to deductively analyse data, a professional coach educator was defined through requisite professional skills, knowledge and typical behaviours in six inter related domains of understanding. While this definition was achieved, it is important to recognise that this definition is reflective of the combined high-level skills of all 16 coach educators, they are therefore somewhat aspirational in nature. Due to their aspirational nature and the ill defined nature of the role ‘coach educator’, the defined domains offer benchmarks that both coach educator practice can be measured and course design be completed.

The chapter concludes by offering a brief overview of how a professional development postgraduate course was designed and implemented for coach educators from the Football Association. In so doing, the implementation and content of the course followed the recommendations offered throughout this thesis.

1.7 CHAPTER 7 OVERVIEW

This is the conclusion chapter. To conclude the thesis I return the two broad aims of the thesis, to offer some answers to the questions of; what is coaching and how do we develop it? In order to answer these questions I draw on the core conclusions of each chapter. In completing the thesis I make recommendations for future research.

CHAPTER 2 WAYS FORWARD FOR COACHING RESEARCH

2.1 OVERVIEW

Reflecting its evolutionary status, there have recently been a number of attempts to provide a 'state of the nation' overview for coaching science, together with options for future development. The need for 'tidying the field', which such overviews represent, is arguably an inevitable feature of coaching science as an emerging discipline. As any new applied human science evolves, it undergoes an exponential explosion in theory: new ways of explaining, predicting and modifying behaviour are presented and, hopefully, tested to see which offer the most parsimonious and positive outcomes. Another important series of way-marks must also take place, however. Unless a science is to repeatedly split and sub-split into factions the theories need to be tested and synthesised with the strongest ideas refined and retained. For example, theories can be combined to strengthen relevance, boost the percentage variance for which they account, and offer improved implications for practice, training and further investigation. Such theories therefore are able to offer ever better service to practitioners, the main consumers of the research, in an applied discipline such as coaching science.

Without this synthesis, two problems arise. Firstly, the applied science becomes ever less applied, as practitioners (i.e. coaches and coach educators) increasingly turn away from, or even ignore, the results as holding less and less relevance for the real world (cf. parallel experiences in motor control - Christina & Bjork, 1991). As a second consequence, academics become increasingly subtle and esoteric in their work, shifting focus to 'newer', hereto unexplored territory to maintain and enhance their publishing reputation. Unfortunately, both problems combine to make the discipline less and less relevant in the domain for which, in many cases, it may have been designed.

Reflecting these concerns, I believe that a synthesis in coaching science is somewhat overdue. New coach training initiatives often show little or no evidence of a research influence, while the sub-division of ideas using 'new and discrete' topics such as a social or political perspective (e.g. Potrac & Jones, 2009) seems to challenge the inherent integration which should surely characterize real-life practice. In short, what applied disciplines need to generate are theories which can strongly influence professional practice in the real world, where coaching behaviour, session design, social environment and playing politics are all part of the one essential game.

Reflecting this need, this chapter considers two interlinked features that may offer such a new direction, or at the very least generate debate based on a more integrated application. Firstly, I present a brief review of current 'positions' in the literature, seeking *commonality* rather than *distinction* against a benchmark of *practical implication*. Secondly, I explore the process of planning and doing coaching as a *decision making exercise*. The suggested integrative focus on the Professional Judgment and Decision Making (PJDM) of coaches is compared to other parallel professions (such as teaching), and also to the distinctions between different types or styles of decision making (DM) which are starting to emerge in the coaching literature. As the final, third section, synthesis of these two theoretically based, empirically supported and clearly applied considerations leads to the suggestion of an integrated model, termed 'nested thinking' which can offer a stronger model for testing and training professional practice.

2.2 REAL-WORLD COACHING: APPLYING POLITICS, SOCIAL SCIENCES AND PEDAGOGY

Perhaps *the* key issue that researchers in coaching have been trying to address for the last three decades is defining coaching practice. Initially, practice was viewed very much through a behavioural psychology lens that examined the behaviour of coaches using different contexts as the independent variable. The integration of findings to practice was to identify verbal behavioural profiles of expert coaches that could then be prescribed to more novice coaches (e.g. Smith, Smoll, & Curtis, 1979). More recently, research has turned to examining the cognitive processes (including what can/does influence these processes) that coaches use to deliver behavioural (i.e. verbal and body language) and physical (i.e. plans) outputs in relevant coaching contexts, be it training sessions, games or planning time. Such a change of emphasis led Abraham, Collins and Martindale (2006) to conclude that there is a level of consensus that coaching (inclusive of all 'practice') is a decision making process. However, while such consensus is building, there is far less of a consensus as to the types of decisions that are made or what knowledge is required to make these decisions.

Furthermore, it is not always apparent whether research within the coaching domain is working towards actually directing the coaching process. As such, a consensus often has to be inferred from research choosing to generate results *of* the coaching process rather than *for* the process per se. For example, approaches such as Jowett and Cockerill (2003) have delivered vast amounts of data relating to coach-athlete relationships and/or interactions, yet this work has become so reliant on questionnaire data that the ideographic nature of coaching is missed. Consequently, although there is

implicit reference to coaches needing to change behaviour (requiring explicit reflections on current ways of thinking and behaving) the work is so de-contextualized from the full scope of individual coach decision making that the scope for drawing transferable development conclusions is limited.

This issue notwithstanding, the bulk of recent research has progressed with a goal of improving our understanding of coaching as a complex process. Unfortunately, even here research has not explicitly considered the required changes to development methods enabling coaches to cope and excel within this inherent complexity. Against this background, I argue that the extant research that does hold applications for coaching practice or development can be grouped as coming from a socio-political stance (i.e. strategic and political goals and problems coaches face), a sociological/social stance (i.e. the social setting within which coaching occurs) or a pedagogical stance (i.e. how coaches create meaningful learning and development opportunities for athletes and/or teams). I further suggest that all three offer ideas that are 'correct' but that all appear to lack a 'big picture' outlook to really guide their integration into coaching development and/or practice.

There is clearly a great deal of research within coaching that could be grouped under these titles but it is not my intention to review all of it. Rather, I offer a review of exemplar approaches that see coaching as drawing on these distinct knowledge sources.

2.3 EXEMPLIFYING KNOWLEDGE SOURCE IMPACTS ON COACHING RESEARCH AND APPLICATION

2.3.1 Pedagogic research

Gilbert and Trudel (2004) completed a major review of published empirical research in coaching. It is from this review that I argue four broad pedagogic key themes emerged;

i. Coaching practice can be modelled and that knowledge is required to perform the role of coaching.
ii. Coaches use a range of strategies in practice.
iii. Coaches reflect to become better.
iv. Coach-athlete relations are linked to efficacy and knowledge of self.

2.3.1.1 Coaching models

Various coaching models have emerged over the last 20 years (Abraham et al., 2006; Chelladurai, 1990; Côté, Salmela, Trudel, Baria, & Russell, 1995; Lyle, 2002), typically with the goal of offering a structured account of a complex field by acknowledging the broad issues that coaches need to consider in completing their role. I suggest that these models can be classed as being either first or third person models (an issue I return to in chapter 3). The former are typically focused on viewing coaching through the coach's eyes and seem therefore directly relevant for influencing coaches' practice (i.e. research primarily conducted *for* coaching). Conversely, the latter are generally focused on identifying human and structural factors that can influence a coaching environment (i.e. research *of* coaching). Typically psychometric in nature, research of coaching has produced lots of data but, mostly with limited impact for practice. Consequently, it is the models for coaching that more directly offer structured ideas for improving coaching practice, identifying a process to guide the decision making of coaches. For example, drawing on the schematic model of Abraham et al (2006) Abraham, Muir, & Morgan (2010) identified six knowledge domains (each with sub areas);

i. Understand the Athlete.
ii. Understand the Sport.
iii. Understand Pedagogy.
iv. Understand Process and Practice.
v. Understand the Culture.
vi. Understand Self.

(I will return to this idea of there being six knowledge and understanding domains throughout this PhD). In contrast to this level of definition, however, are the rather broad ideas of Chelladurai (1990) which offer relatively little definition. The bottom line is that broad and defined sources of requisite knowledge have been identified, but only by comparatively few studies.

2.3.1.2 Coach athlete relationships

Despite (in my view) being too reductionist in nature and reliant on psychometric measures, the work of both Jowett (e.g. Lorimer & Jowett, 2009) and Myers (e.g. Myers, Payment, & Feltz, 2004) on coach-athlete relationships also reinforces the need for coaches to make greater use of knowledge from the pedagogic domain. However, there is additional recognition that making use of other domains of knowledge, such as counselling or conflict management, may also enable coaches to create effective

working relationships. This is an interesting development as it links with the requisite knowledge identified by both Abraham et al. (2010) and Côté and Gilbert (2009) (i.e. knowing the athlete and self, inter and intra personal skills), and other work on the social and political issues within coaching, a point I will return to later.

2.3.1.3 In situ studies: Coaching strategies

While models and psychometric measures exist, offering both a structure and context to coaching practice, they have often been criticized for being too structured and unable to explain the unpredictable nature of coaching (Cushion, 2007; Jones, 2007; North, 2013), especially within coaching sessions and games. Much of this criticism is drawn from the few in-depth investigations of practice (e.g. d'Arripe-Longueville, Saury, Fournier, & Durand, 2001; Saury & Durand, 1998) where qualitative, on-task data have been collected. This research does recognise the intentionality of coaching; specifically, that some coaching is well planned and thought out, drawing on pedagogic knowledge bases to inform practice, and providing implicit support for the aforementioned coaching models. However, within the same work there is greater reference to the dynamic and complex nature of coaching, questioning whether required knowledge is only drawn from formal disciplines such as skill acquisition or physiology. Rather, additional requisite knowledge may be in the form of intervention 'recipes', encountered in the form of drills or 'preset' questions (c.f. with my discussion on the use of heuristics later in this chapter). Recognition of the formal and informal nature of coaching by Saury and Durand (1998) led to a research focus that examined the social complexities of coaching.

2.4 SOCIAL AND SOCIOLOGICAL RESEARCH

Over the last ten years there has been a significant amount of work that has examined the social complexities of coaching (e.g. Bowes & Jones, 2006; Cushion, Armour, & Jones, 2003; Potrac & Cassidy, 2006), much of which was driven by the note from Saury and Durand (1998) that coaching just isn't systematic. While the social interactions examined have largely been in pedagogical settings, the argument has been that the subtleties of the environment were being missed because of the positivist approaches used. The implication being that too much of this research didn't recognize the beliefs or assumptions of the various stakeholders (coaches, athletes, parents etc.) that drive much of the behaviour observed during social interactions in coaching.

There are obvious connections here with the reflection-based research I refer to later. For example, the work of Strean, Senecal, Howlett, and Burgess (1997) who, drawing on the work of Brookfield (1995), identify that reflective practice must connect with

paradigmatic assumptions (deeply held beliefs) if practice is really to be influenced. Typical paradigmatic assumptions might include, self serving bias when attributing success and failure, managing impressions of self in front of others, and seeking power and/or control over self and others. Unfortunately all of these assumptions are often tacit *but* have a great deal of influence over behaviour. For social researchers this means there will always be an element of second guessing the intentions that underpin interactions; most especially because people may not be aware of what their intentions are! Consequently, from this perspective, much of coaching often goes unsaid and unrecognized by researchers.

In addition to the issues of recognizing the role of beliefs on coaching, so much in coaching is hard to predict that, even when findings from the positivist sciences, e.g. physiology or biomechanics, do have applications to coaching (and these are frequently already included in coach education), the chances of real impact are slim without recognizing the complexity into which they are expected to integrate (Jones, 2007). In summary, for such researchers formal development in positivist disciplines is unlikely to have a significant impact on coaching quality since it cannot allow for the inherent complexity.

While drawing attention to the 'complexity' problem, Jones and Wallace (2006) also offer a working concept, described as orchestration, for dealing with this complexity. They described orchestration as a "coordinated activity within set parameters expressed by coaches to instigate, plan, organize, monitor and respond to evolving circumstances..." (Jones & Wallace, 2006, p 61): going on to suggest that:

> The detailed planning and coordination functions inherent in orchestration are crucially characterized by flexibility. …. retaining short term flexibility through incremental planning while attempting to retain some coherence through longer term planning cycles. Plans are coordinated and frequently updated both formally and informally based on detailed monitoring and evaluation of practice. (p 61-62)

I believe that these descriptions offer some guidance to influence the development of coaches. The use of "set parameters" to structure work and the use of a hierarchy between short and long term objectives seem particularly relevant. However, even on full reading of this definition and the associated explanations, it is difficult to operationalize and teach the actual mechanisms and practical skills that could be deployed. Once again, the ideas seem to lack explicit direction that may be used to drive coach development. Furthermore, I would argue that the criticism of positivistic approaches runs the risk of throwing the baby out with the bath water. Finally, I

suggest that the descriptions and processes offered in this literature are so complex that the inherent coaching complexity remains unaddressed.

2.5 APPLYING POLITICS

A more recent development for examining and influencing coaching has come from Potrac and Jones (2009) who have considered behaviour through the micro politics of relationships. Continuing and developing the theme developed by the second author, these authors argue that coaching is not "an unproblematic, progressive process but as (sic) an arena for struggle" (p233). As such, they draw on a definition of micro politics from Blase (1991, cited in Potrac & Jones, 2009, p225) in that it;

> … refers to the use of formal and informal power by individuals and groups to achieve their goals. In large part, political actions result from perceived differences between individuals and groups, coupled with a motivation to use power and influence and/or to protect… Both cooperative and conflictive actions and processes are part of the realm of micro-politics [while] the macro and micro frequently interact. (p.11)

Again, I believe this interpretation holds value for coaching, especially as it recognizes that this form of behaviour is not necessarily a bad thing – in fact it may well be crucial to engaging effectively in coaching and performance environments (cf. the managerial work of Butcher & Clarke, 2008). Yet again, however, there is lack of specific structure or idea of how this work can be used to influence coaching practice. So, while Potrac and Jones (2009) argue that leverage points are often searched for by the politically aware person, and that developing coaches' ability to engage in this behaviour proactively is probably crucial, (once again) no mechanism for achieving this is offered.

2.6 REFLECTIVE PRACTICE IN COACHING: HOW COACHES (MAY OR MAY NOT) GET BETTER

I have already made several references to the role of reflective practice in coaching and this has been one of the major domains for coaching research in recent years. This research has employed experiential learning theory (Brookfield, 1995; Schön, 1991) to examine coaches' practice and development. Consequently, this work has offered a potential dual impact within coaching. Firstly, it prescribes a method for understanding how coaches may have developed through experience. Secondly, it represents a meta-cognitive knowledge base that can be taught to coaches to influence their efficacy in engaging in reflective practice in order to become better at becoming better! Both also have clear links with the notion of coaches needing to know

themselves better (Abraham et al., 2010; Côté & Gilbert, 2009). It is also exactly what research from the social and political perspectives is referring to when identifying how coaches must become more aware of the social norms/assumptions that drive people's (coaches, athletes, parents, managers, etc.) behaviour. As such, reflective practice is often seen as being *the* answer to understanding and developing coaching more effectively.

In an attempt to structure and optimize the reflective practice return, Gilbert and Trudel (2001) offer a model to guide reflective practice that encourages coaches to explore issues that have arisen in their coaching in a rigorous, in-depth manner. Crucially from the perspective of this chapter, this encourages coaches to be reflective against the standards offered by *both* other coaches and research in order to make critical and informed decisions about future behaviour (cf. the 'judgment with standards' requirement proposed by Strean et al., 1997). However, there is a lack of structure to guide best use of these external standards: specifically, how do coaches *know* that all relevant issues have been explored and what research they need to seek out? Thus, while the model offered by Gilbert and Trudel (2001) offers a structure to guide the mechanics of reflection, it doesn't operationalize the actual reflective process of issue setting, unpacking, and solving which are seemingly left to the biases of the people involved, an issue I will return to later. At its core level therefore, this situation exemplifies the idea I promote throughout this chapter; namely that good (correct?) ideas are being offered by research but bits of the full picture are missing, such as how exactly these ideas are best presented to, and critically applied by, coaches.

2.7 SUMMARY

2.7.1 Conflicts and agreements

On reviewing the research presented, two broad approaches present themselves. Those which seek to provide structure to the coaching process through some level of modelling (overt or scaffolded through broad conceptual ideas), and those which suggest that the complexity in coaching presents too many issues for simplistic models to adequately explain the coaching process. This issue is encapsulated by the discursive paper by Cushion (2007) and respondent commentary by Lyle (2007) with the former offering the complexity argument and critiquing models of coaching, the latter countering with a critique that the complexity argument was 'over egging the pudding'. Reflecting the same arguments I have made earlier, Lyle (2007) suggests that structure is crucial to counter the complexity.

However, I suggest that their theoretical posturing was an (albeit required) attempt at establishing some clear blue water between these philosophical positions when, in fact, none (or at least very little) needs to exist, most notably from a practical perspective. As identified earlier, I believe *all* of the research reviewed presents arguments that are 'correct' and, in fact, final conclusions from these authors agree more than they disagree. Comparing the sociologically derived ideas of Jones and Wallace (2006), the politically derived of Potrac and Jones (2009), and the cognitive-behavioural perspective from Côté and Gilbert (2009), there seems a clear and general agreement that coaching requires a high degree of flexibility, knowledge and thinking in order to excel. In short, there is truth in all of these interpretations and I argue that (good) coaching is, and indeed must be, systematic. Researchers have to identify and develop systems to cope most effectively with the 'swampy lowlands' of practice (Schön, 1991); the issues to be addressed if the coaching process is to be optimized.

2.7.2 What should practical guidelines look like?

Throughout this chapter I have been somewhat critical about the lack of structure or mechanisms offered: but what do I mean by structure or mechanisms? Vygotsky's (1978) concept of scaffolding is probably the best analogy. In essence, a scaffold offers guidance on what elements of a problem need to be attended to, what knowledge may be required, strategies which can be used to address the problem, and encouragement for the 'performer' to recognize and use the knowledge and skills they do have and seek out the knowledge and skills they do not. Consequently, given the suggested complexity in coaching, research needs to provide coaches (through coach educators) with a structure to scaffold their approach.

Typically, Vygotsky (1978) suggests that this needs to be done through explicit guidance such as questions and instructions. Despite the criticism of models in the coaching literature, evidence from teaching suggests that models of practice (e.g. Entwistle & Peterson, 2004; Mosston & Ashworh, 1994) can be crucial in developing these mechanisms (scaffolds) to guide relevant questions and instructions; often enabling subsequently more self-directed growth. So, reflecting this approach, any new model must ensure that the early criticisms of over-positivism are accounted for, and that the pedagogical, social and political factors of coaching are both encompassed and integrated - one of the goals of this chapter - but through the unifying focus of decision making.

2.8 PROFESSIONAL JUDGMENT AND DECISION MAKING (PJDM) AS A UNIFYING FOCUS OF THEORY AND PROCESS

As is now hopefully obvious, I see more commonality than difference in what are often considered somewhat orthogonal approaches to conceptualizing the coaching process. Indeed, I also see the ways in which coaches decide what to do as a common issue; decisions all researchers suggest are best made against a set of external criteria critically internalized by the coach (be they generated by experience, research, reflection or other coaches). This leads me to an expressed focus on understanding coaching as a PJDM process as the most integrative and parsimonious pathway to improved coaching.

PJDM as unifying concept was first put forward by Martindale and Collins (2005) in their discussion about the similarly emerging profession of Sport Psychology practice. At its simplest the concept drew on the view that sport psychology practice is (like coaching) a judgement and decision making process. As such this view brings with it a set of theoretical constructs that allow practice to be explored and theorised. However, given the progress of viewing sport psychology practice as a profession they added to this view with philosophical discussion (e.g., Carr, 1999) about what *professional* practice actually entails and the standards that it brings.

While such a theoretical stance is already established in other applied fields such as sport psychology (Martindale & Collins, 2007) and similar contexts such as teaching (Entwistle & Peterson, 2004), and medicine (Lamb, Green, Vincent, & Sevdalis, 2011) there is a dearth of research in coaching that takes a similar PJDM view. Therefore, in pursuing an PJDM view in coaching, I first consider the underlying JDM theoretical and practical questions, some of which are already under consideration in the coaching field. Following this I will explore some of the philosophical issues that come with suggesting that coaching can be seen as a *profession.* For the purposes of clarity and simplicity, I will delimit the exemplars and applications to performance coaching with adults although, as occasionally demonstrated throughout the rest of this chapter, the tenets of this integrative approach work equally well in other environments, albeit with different considerations and foci.

2.8.1 Classical and Naturalistic Decision Making: Thinking and Intuition

So if PJDM is crucial to coaching, examining research on decision making should provide useful insight. Initially, there was one school of thought in the literature regarding making effective decisions known as Classical Decision Making (CDM) (Lipshitz, Klein, Orasanu, & Salas, 2001). This approach assumes that answers to difficult question existed but would need careful thought drawing on known standards to engage in judgement and decision making to arrive at them. Approaches cited in the previous section refer strongly (with evidence) to the need for practitioners to be able to make considered decisions. Effectively completed, indeed as a characteristic of expertise in that field, these decisions will efficiently and appropriately compare and contrast potential options for understanding and solving a problem before a choice is made on which particular action to take – in short CDM seems to match up well with coaching (and other applied domains) practice. This approach would typically be applied during planning, implementation and review stages of practice in order to progress their athletes (or clients) towards set goals (Abraham et al., 2014).

Recently, however, this approach has been criticized within the coaching literature for being unable to explain how coaches operate in settings where there isn't sufficient time to make thought through and considered decisions (Cushion, 2007; Lyle, 2010). Indeed, the literature examining the decision making of professionals in other domains suggest that CDM cannot adequately explain decisions that were made in a mix of: "ill structured problems, uncertain dynamic environments, shifting, ill defined or competing goals, action/feedback loops, time stress, high stakes, multiple players, organizational goals and norms" (Montgomery, Lipshitz, & Brehmer, 2005, p2). This has led Lyle (2010) to focus strongly on the NDM work of Klein and colleagues (e.g. Klein, 2008; Lipshitz, Klein, Orasanu, & Salas, 2001), and its application to coaching.

The NDM model, originally developed based on observations of high pressure, real life settings such as fire-fighter decision-making, is descriptive, providing a frame within which characteristics of experts can be distinguished from those of novices. One mechanism suggested to be involved in NDM is the ability to connect recognized (i.e. seen before) cues from the environment to a method of action. Given the vast array of cues available in the coaching environment, learning to recognize pertinent cues and to then develop relevant actions clearly takes a long time, which is why NDM appears to differentiate experts from novices.

Certainly therefore, this approach seems to be relevant and is clearly parsimonious for the decision making of coaches in time pressured, ill structured domains such as those referred to by Saury and Durand (1998) in coaching sailing. In fact, Lyle (2010) considers this approach to fit so well that he significantly (I suggest overly) downplays (to the point of irrelevance) the role that CDM approaches can fulfil, i.e. “decision taking is not about choices…. but about coming to the most appropriate decision on an on-going basis” (Lyle, 2010, p 29). This would be supported by Klein's (1998) work which supports the notion that experts do not routinely appear to directly compare multiple options in naturalistic settings. However, I contend that a *sole* focus on NDM completely obviates the complexity inherent in the coaching environment and the need for thoughtful judgements and decisions in planning and review cycles of coaching (i.e. CDM). These issues not withstanding however, a focus on decision making offers a strong theoretical backdrop to investigating coaching practice.

2.8.2 Professionalism in Coaching Practice

While we can investigate coaching against Judgement and DM theory, the *professional* element of PJDM brings further focus to how coaching practice can be theorised and therefore investigated. Given the publicly and privately funded, full time nature of a significant proportion of coaching (North, 2009) *and* its close alignment with similar established professions in sport and education, it is not surprising that there is a desire for coaching to be seen on an equal professional footing.

By way of example, it is a stated strategic aim of the International Council for Coaching Excellence (ICCE, 2010) for coaching to be seen as a profession. Prior to this position UK Sport in 2001 had a goal of coaching within the UK being elevated to a profession by 2102 (UK Sport, 2001). This view was somewhat watered down to coaching being a *professionally regulated vocation by 2016* in the UK Coaching Framework released in 2009 (Sport Coach UK, 2009). This watering down is not explicitly explained but presumably reflected less progress on professionalization than expected and the issue of finding ways to include the majority volunteer workforce. Again, this issue not withstanding, professionalization remains a clear goal for coaching.

The desire for coaching to be explored as a profession will subsequently bring with it the need to meet defined professional standards. Rather than a theoretical concept, professionalism has typically been explored from a philosophical standpoint. For example, both Carr (1999) and Downie (1990) have identified that professions are defined by their recourse to theoretical and/or empirical knowledge in making judgements. Furthermore, that this practice is checked, monitored and informed by a critically informed peer group.

While it is desirable to examine coaching as a proposed profession, a problem exists in the lack of research examining the philosophical view of professionalism within the theoretical judgement and decision making literature. Instead the focus has typically been on expertise (Abraham et al., 2006; Nash, Martindale, Collins, & Martindale, 2012) with Côté and Gilbert's, (2009) providing the following definition of what an expert coach is able to do:

> The consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in specific coaching contexts (p. 316).

Given the obvious links with this chapter relating to judgement based on knowledge and the explicit reference to professional knowledge I will view expertise as being synonymous with professionalism for the purposes of this and subsequent chapters. This issue is, however, further unpacked in chapter 5 in summarising the research around expert professional coaching from this thesis and in discussion of the development of professional coaches.

Given the positions proposed here, a fair conclusion at this stage would be to say that coaching can be viewed as a PJDM process. That is, coaching is a process of judgement and decisions formed through a consideration of knowledge gained from theoretical and peer informed sources. Furthermore, that coaching can be further explored and investigated through this theoretical (i.e. DM theory) and philosophical (i.e. professionalism) approach.

2.9 FURTHER UNPACKING DM PROCESSES

2.9.1 Type 1 and Type 2 DM

Thus far, in order to lay the groundwork of PJDM I have mainly discussed the links between CDM and NDM. Furthermore I have discussed how these DM processes should draw on a broad and integrated knowledge framework that makes sense of the existing broad church of coaching research. Notably, however, further detail exists that examines the levels of DM that go on within practice: exploring this detail will allow for a more thorough examination of that practice and the professionalism of it.

Running parallel to the CDM and NDM work described has been the similar work of Daniel Kahneman and colleagues (see Kahneman, 2011 for a thorough overview). Kahneman identifies that judgments and decisions are made either through an intuitive,

fast, Type[1] 1 process (i.e. NDM), or through a more considered and slower, Type 2 process (i.e. CDM). As stated, such a view is in keeping with the ideas already presented. However, Kahneman offers further useful insight, particularly about which type is used and when. For example, he suggests that the vast majority of decisions are made through the Type 1 process since this is typically the most efficient in terms of using mental and time resources to solve problems and achieve goals (Kahneman & Klein, 2009). Furthermore, the Type 2 system is used less frequently since it is too inefficient (at least in the short term), slow and effortful in dealing with most day-to-day and moment-to-moment problems. In fact, Kahneman states that, for many people, the Type 2 system is *lazy* such that "…if System 1 is involved, the conclusion comes first and the arguments follow" (Kahneman, 2011, p. 45). This view has important consequences for defining judgement and decision making as being professional as per my earlier points. If coaches consistently rely on Type 1 approaches in their coaching and neglect Type 2, their capacity to be professional both as a practitioner and learner inevitably becomes compromised. Indeed, in the absence of this more critical (but slower) thinking, professionals have been observed to become too reliant on easily accessed heuristics, often ideologically based, to solve problems (Kahneman, 2003).

2.9.2 Recognition Primed Decision Making (RPD)

In contrast to Kahneman, the work of Klein and colleagues has focused on examining how practitioners can and do make *professional* fast Type 1 naturalistic decisions (NDM) in pressurised circumstances; for example, firefighting (Lipshitz et al., 2001). Klein argues that professionals *are* able to consistently make correct decisions without the need to revert to slow CDM. To exemplify this capacity, the Recognition Primed Decision Making (RPD) model, one of the most consistently referred to models within the NDM literature, was developed (Klein, 2008; Lipshitz et al., 2001). This empirically supported model predicts that, in naturalistic environments, expert professionals are able to make use of recognized perceptual cues/patterns to make fast decisions. These researchers go on to suggest that there are three levels to the RPD model, that are enacted according to just how recognizable the perceptual cues are (Lipshitz et al., 2001). In his work examining volleyball player decision making, Macquet (2009) summarised the three levels as follows:

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[1] The words *Type* and *System* have been used interchangeably in the literature when referring to the dual processing view of judgement and decision making. For consistency I will use Type, unless System facilitates a clearer description or is used in quotes from the work of others.

Simple Match. At this level, cues in the environment immediately and automatically match, with no or extremely limited conscious activity, leading to a decision and action.

Diagnose the Situation. This level is enacted when perceptual cues do not immediately offer a view on the expectancies in the environment. As such, the expert uses their knowledge, both tacit and explicit, to simulate what may have led to the situation. A view is quickly established that matches a course of action and a decision is made.

Evaluate a Course of Action. This level is enacted when the situation is recognized but a solution does not immediately present itself. The expert, again drawing on knowledge, will then mentally simulate the consequences of alternatives before selecting a course of action.

All three levels of RPD are fast acting, although only the first level is truly intuitive, as Klein states;

> The pattern matching is the intuitive part, and the mental simulation is the conscious, deliberate, and analytical part. This blend corresponds to the System1 (fast and unconscious)/System 2 (slow and deliberate) account of cognition (Klein, 2008, p.258).

Although Klein argues that this account integrates the System (Type) 2 process, there is a further argument that even here the use of System 2 is not as deliberate as perhaps it could be. Consequently, an adaptation to the RPD theory was created to consider how professionals cope with uncertainty, such as when there is no immediate intuitive response available (i.e. when the 2nd or 3rd RPD processes are required). The solution, known as RAWFS, was offered by Lipshitz and Strauss (1997). These authors argue that when a professional encounters uncertainty they draw on one or more of five coping mechanisms. Four of which are as follows *Reduce uncertainty by collecting additional information*, *make Assumptions*, *Weigh up pros and cons*, and *Forestall*[2]. These would align with Klein's view that professionals engage in Type 2 thinking. However, these and other authors identify that the use of Type 2 conscious activity in these circumstances only continues until a diagnosis or action that satisfies the immediate needs of situation, or which at least buys some time, is selected – a behaviour labelled *satisficing* (Lipshitz & Strauss, 1997; Mascarenhas & Smith, 2011). Klein argues that the satisficing process is still expert or professional since their data identifies that this leads to correct courses of action more often than not. This

[2] The underlined capital letters spelling RAWF. The missing S relates to a 5th option, which is to simply Suppress uncertainty.

argument, however, seems to be at odds with the empirical and theoretical view of critical, theoretical and peer engaged professionalism described earlier.

In summary, the NDM view on professional practice places great emphasis on the professional's capacity to deal with issues as they arise. It relies heavily on the professional's capacity to respond intuitively through the recognition of expected patterns in perceived cues or noticing differences in from expected patterns. This typically leads to the framing problems through tacit knowledge learned through experience. When intuition cannot answer the problem, there is recourse to more considered problem solving. However, this problem solving is rarely fully analytical in nature since the goal is to create a satisficed rather than optimised response.

In essence therefore, rather than the black and white view of Type 1 and Type 2, it appears that there is a third way. There are situations where the selection of problem recognition or problem solution are guided by some limited thinking or rules that are introduced to cope with encountered uncertainty.

2.10 RESOLVING CRITICISMS AND FINDING A WAY FORWARD

Returning to the theory of DM, it is clear that two broad views exist; Type 1/NDM and Type 2/CDM, but which is correct for coaching? It could be argued that this depends on the desired end product. Despite a substantial knowledge base, experts often make snap judgments. The good news is that these are often correct...the bad news is that they aren't always (Kahneman & Klein, 2009; Myers, 2010). Furthermore, even though experts do successfully use NDM approaches, this doesn't describe the methods used to develop up to the point of expertise, which almost certainly involved a high degree of thought, problem solving and learning (Schon, 1983), i.e. CDM. Finally, such slower reflection and weighing up of alternatives is also essential to drive the constant refinement and innovation of practice which is so necessary in the rapidly evolving challenge of performance sport. In keeping with the integrative theme of this chapter therefore, it seems that both CDM and NDM are correct, but in a proper balance and place. In order to better understand this issue the relative roles of NDM or CDM in coaching are perhaps best explored by examining the limitations of both, as well as focusing on their strengths.

2.10.1 Problems With CDM

I have already noted how thoughtful and considered problem solving (CDM) struggles to explain expert decision making in time pressured environments. Furthermore that there are problems with an expectation that exact answers exist and they only need to

be found. While the role of lack of application of CDM in time pressured situations is fairly obvious, the limitations in searching for exact answers is less so.

The view that answers exist and need to be found was borne out of an empiricist application of laws from the physical sciences (Lipshitz et al., 2001) – indeed this view was prevalent in education with the 'answers are in the back' approach to text books. However, in the swampier (Schön, 1991) domain of human development and behaviour the original CDM approach didn't match the reality where dualistic exact answers don't exist, rather that they emerged based on a relativistic thoughtful response to the context (Abraham et al., 2006; Entwistle & Peterson, 2004; Lipshitz et al., 2001).

Further to this criticism, Klein (2011) argues that in the search for systems, CDM as a 'correct answer' process has been applied to the creation of fool-proof risk management and quality assurance processes in the security services. While such measures are probably important, Klein argues that they can bypass crucial aspects of expert human intuition. As such important 'patterns of data' not acknowledged by the system are missed that would otherwise have been spotted. While Klein points to the security services for evidence of this problem, similar problems have been identified in the limited application of sport science and or management metrics in sport (Abbott & Collins, 2002). In short the application of CDM to system development can lead to a situation of people looking for black and white answers in a shades of grey world.

2.10.2 Problems With NDM

There are clearly strong theoretical reasons for professional or expert practice to be examined through the theoretical lens of NDM. However, Kahneman (2011) has argued (and for some time) that an over reliance on Type 1 (NDM) thinking can lead to the inappropriate application of heuristics to problems that demand greater thought and consideration. Heuristics are explicit or tacit cognitive rules that provide short cuts through to solutions of encountered problems. They work in two ways, firstly by directing attention to only key information or cues in the environment, thus avoiding committing resources to non-important cues. Secondly, by connecting cues quickly to known patterns of information and/or ready made solutions (c.f. with the second and third methods of RPD). Indeed, it is likely that without the capacity to draw on heuristics coping with everyday life would be almost impossible. However, Kahneman argues that societal culture demands that practitioners look like they are in always in control and decisive. Experts are very quickly hung for their indecisiveness, just watch coaches/managers and or politicians interviewed on TV. However, it is not just the press who reinforce quick answers and punish slow (apparently) rambling responses;

patients do it with doctors, students do it with lecturers, (poor) lecturers do it with students, interviewers do it with interviewees and performers certainly often do it with their coaches. So much so the continued application of heuristics almost becomes habitual.

This issue is also reinforced by the way humans recognise expertise. Kahneman and Klein, (2009) suggest that expertise is typically confirmed through peer review, i.e. the expert is the person recognized as being so by his or her peers (in coaching this could be players, staff, press, managers etc.). As such, if the peer support (and surrounding system) reinforces the need to looking decisive and ignores or even 'punishes' thoughtfulness then this is the approach that will emerge. It is in this space that Kahneman argues real problems can occur – such as the economic crash (Kahneman & Klein, 2009; Kahneman, 2011).

Further to the problem of inappropriate application of heuristics, Kahneman also notes that a reliance on Type 1 thinking also increases the likelihood that dispositional biases, that all humans have, can guide action in a tacit uncontrolled manner. As with heuristics, biases do serve as important guides to human behaviour. However they can also hinder or reduce critical self reflection as noted by Tetlock (2005);

> … the work of cognitive conservatism: the reluctance of human beings to admit mistakes and update beliefs. The other is the self-serving attribution bias: the enthusiasm of human beings for attributing success to 'internal' causes, such as the shrewdness of one's opinions, and failure to external ones such as bad luck (p128).

Note also the piquant observations of Galbraith (cited in Gilovich & Griffin, 2002, p 7); "when faced with the choice between changing one's mind and proving that there is no need to do so, almost everyone gets busy on the proof". Both quotes point to 'thinking through decisions' as being low on people's priorities if ready-made solutions exist. Of course, if no solution exists, people *should* have to think things through especially if the answer is important, given that they can resist socially generated pressures to provide quick decisive answers so as to maintain their *apparently* 'expert' status.

Within coaching one issue that exemplifies this issue is in the domain of talent identification and development. Recent research (e.g. Abbott, Button, Pepping, & Collins, 2005; McCarthy & Collins, 2014) has displayed that many past and present approaches are too readily based around the decisions of coaches towards applying high performance philosophies of selection and de-selection to attain more immediate and short term goals of having the best age group team. This approach was heavily

influenced by the coach's desire (impression management bias) to generate an impression of being a winning coach, which was socially reinforced by significant others in the first place. As such, the coach continues to be drawn to select age group players who fit a profile and coach them in a way to achieve results rather than work to long-term development agendas; in short, apply a flawed 'heuristic' that ignores information which shouldn't have been ignored.

Kahneman argues that if motivated to think carefully, people will reflect on their experiences and should/may seek external input (I acknowledge knowing where to look for this is probably crucial) to develop understanding and better actions. It is when individuals stop (or never start) doing this that inherent biases aligned with heuristics begin to dominate decision making, especially if important peers, perhaps unwittingly, recognize actions as being 'expert'. There are obvious knock on effects here for how 'communities of practice' operate. As one important example, social reinforcement of increasingly 'routinized' decisions will almost inevitably stunt the growth of the coach, even if she/he had already achieved justifiably expert status. Without constant critical reflection and appropriate innovation, such 'decisive' experts will fall behind.

A further related problem with an over reliance on NDM can occur from expecting experts to always be expert in their responses to immediate events. While NDM relies on the expert being able to recognize some environmental cues (while ignoring others), connect them to relevant actions and make a decision, we must also acknowledge that coaches do come across situations that they do not recognize, with subsequent actions being far from expert (Bowes & Jones, 2006). Consequently, the coach will inevitably default to use of a heuristic that is biased by the moment they are in: for example, the first time a coach comes across a performer who breaks down in tears during training and needs to respond. This response will be heuristically based and probably driven by the emotion the coach was feeling at the time. Whatever the response, it may often not be driven by expert recognition.

As Kahneman and Klein (2009) would argue, if the coach recognizes this response as being weak (Anderson, 1987) then the moment can be debriefed and development can occur – i.e. the coach should then engage in critical incident reflection (Gilbert & Trudel, 2001) but notably against the kind of external criteria described earlier. However, if there is an over-confidence and/or no recognition/consideration that a sub-optimum solution may have been used, then no learning will occur and mistakes will inevitably occur again in the future.

I return, therefore, to the initial question of what the limitations of NDM are. When coaches forget what made them expert in the first place, is where the answer lies.

Subsequently, most situations are encountered with an (over) confidence that a quick and correct response exists; consequently NDM can quickly turn to biased heuristic problem solving.

2.10.3 An Integrated View on DM

Of course, the NDM approach is highly valuable to those who work in emergency or military situations where a lot of Klein's work has centred. However, as pointed out by Martindale and Collins (2013), not all occupations are defined by such high-pressure, short time frame environments. Sport professions such as coaching, sport psychology and strength and conditioning (Abraham, Collins, & Martindale, 2006; English, Amonette, Graham, & Spiering, 2012; Martindale & Collins, 2012) or other interpersonally based professions (e.g. nursing; Hoffman & Elwin, 2004) would still be identified as *naturalistic* yet may well benefit from spending more analytical time (Yates & Tschirhart, 2006) on problems as opposed to simply satisficing. In fact, for all these professions, critical thinking, planning and reflective practice are seen as being crucial to effective practice (Hoffman & Elwin, 2004; Knowles & Gilbourne, 2010; Strean et al., 1997). Indeed, the simplistic, yet not completely unrealistic, view of coaching being a Plan-Do-Review process would suggest that two major parts of the process have the potential to *not* be time pressured. For example, Schön (1991) refers to the importance of both reflection *on* as well as *in* practice (in practice presumably being similar to the more thoughtful aspect of RPD) for informing and developing professional behaviour. However, at the risk of contradicting myself, even though coaches (and other sport professionals) typically do have more time available to them than a soldier in a combat setting, there will be times when quicker decisions need to be made in training (i.e. intervening in a practice) or competition (half time team talk).

So how does one retain a professional status in naturalistic settings if fully analytical CDM is not possible? Is PJDM possible in naturalistic settings? The answer to this question must be in the way that the NDM and CDM (or Type 1 and Type 2) processes talk to each other, indeed Klein (2011) himself states

> "Not only does the critical thinking process of System 2 monitor the pattern-matching of System 1, but in addition the intuitive pattern matching of System 1 monitors whether the careful analyses of System 2 are plausible." (p.213).

However, Klein does not offer a view (mainly due to his philosophical position on expertise in DM) on how NDM retains a level of professionalism through this process so the question remains.

An insight to answering the question of professionalism comes from the review of DM and judgement by Yates and Tschirhart (2006). Among a broad range of issues covered by these authors they suggest viewing DM as being an opportunity to engage in:

1. *Full analytical DM*. This strongly relates to the analytical Type 2 DM suggested by Kahneman (2003) or the critical, thoughtful CDM processes I have identified in this and the preceding chapter.
2. *Rule based DM*. This strongly relates to the heuristic based DM identified by Kahneman (2003) and the Diagnose and Evaluate options within RPD identified earlier.
3. *Automatic/intuitive* DM. This strongly relates to the Type 1 ideas of Kahneman, (2003) and the Simple Match option of RPD.

Notably, however, Yates and Tschirhart (2006) augment their view on decision making with a view on the judgment that precedes it. They provide a distinction of how analytic and/or rule based decision making may follow a *Formalistic* or *Substantive* judgement process. They identify that formalistic judgment draws on established formal *known* rules or theory (Abraham & Collins, 1998; Anderson, 1982) to guide judgement and decision making. Alternatively, they identify that substantive judgment will draw on personal theory or rules to solve problems. In other words, drawing on the definition of professionalism identified earlier, to remain professional the practitioner should, should follow a formalistic analytical or rule based path rather than a substantive heuristic path. In short, it is theoretically possible for practitioners to maintain a professional approach, even in naturalistic settings, *if* when the opportunity presents itself to use formalistic knowledge they maintain a formalistic approach to their analytical and/or rule based judgements and DM[3].

[3] An important point here is that I am not claiming that all decisions will or even can draw on formalistic knowledge. Clearly, evidence would point to how reliant humans are on tacit knowledge. Furthermore, given the breadth of knowledge identified in the six domains (see 2.3.1.1) it is unlikely that coaches can have extensive formalistic knowledge in each domain.

<table>
<tr><th>Theoretical View</th><th colspan="3">Summarised Description of What Happens</th></tr>
<tr><td>Common Perception</td><td>Plan/Review</td><td colspan="2">Do</td></tr>
<tr><td>Dual Processing (Kahneman, 2003)</td><td colspan="2">Type 2 Decision Making</td><td>Type 1 Decision Making</td></tr>
<tr><td rowspan="2">PJDM: CDM, RPD (e.g., Kahneman & Klein, 2009)</td><td rowspan="2">CDM</td><td></td><td>Simple Match Intuition</td></tr>
<tr><td colspan="2">Diagnose a situation and/or Evaluate a course of action</td></tr>
<tr><td>Decision Modes (e.g., Yates & Tschirhart, 2006)</td><td>Analytic (Formalistic or Substantive)</td><td>Rule Based (Formalistic or Substantive)</td><td>Automatic/Intuitive</td></tr>
<tr><td>Reflective Practice (e.g., Schön, 1991)</td><td>Reflection On or For Action</td><td>Reflection In Action</td><td></td></tr>
<tr><td>Knowledge Source (e.g., Abraham, Collins, & Martindale, 2006; Anderson, 1982; Kahneman & Klein, 2009; Yates & Tschirhart, 2006)</td><td>Formal explicit cognitive structures and heuristics</td><td>Mental models structured around:
Substantive heuristics and/or
Formalistic broad procedural rules</td><td>Highly proceduralised explicit or tacit knowledge</td></tr>
</table>

Table 2.1. A summary of the various decision making and judgement processes thought to be used in professional practice.

2.10.4 Avoiding these problems: Good use of Mental Models

Building on the previous section the important role of knowledge (formative, substantive or tacit) becomes obvious. Given the complexity of CDM and NDM within performance domains such as coaching mental models have been suggested as a means to make decision making generally, and NDM specifically, more efficient within other domains such as fire-fighting and the military (Zimmerman & Harris-Thompson, 2008). Mental models occur when

> there has been an integration of a breadth and depth of knowledge that covers multiple related concepts and conceptions. Furthermore, such structures do not underpin thoughts and decisions, but rather represent the mental workspace where thoughts and decisions are made. (Abraham et al., 2006, p.551)

As such, developing models is seen as a useful training tool for people who operate in NDM situations (cf. my earlier comments about providing a scaffolding structure). However, a review of the mental model literature (Collins, Brown, & Holum, 1991;

Klein, 2008; Zimmerman & Harris-Thompson, 2008) suggests that optimum employment of mental models requires attention to three key factors. Firstly, the implementation of these models requires an initial high level of cognitive engagement and thought, meaning that CDM is an essential component. For example, Kahneman and Klein (2009) suggest 'premortems' where plans are assumed to have gone wrong and alternative solutions are sought even before the plan has been put in place. A similar strategy of if-then planning has been employed in teacher education (Tjeerdsma, 1995). Secondly, the initial development of models requires a high level of critical analysis of the role of the NDM person, which generally means a high level of CDM underpins any model (Militello & Hutton, 1998). Thirdly, elements of mental models may be more relevant in different situations such that there are times where a whole model may be useful for CDM opportunities and others when less is relevant to NDM opportunities due to attentional demands on working memory.

So how effective are the currently available coaching models in offering mental models to support coaching practice and development? Unfortunately, the full answer to that question is not know since, to my knowledge, none of these models have been tested in intervention studies. Indeed, only one model, the coaching schematic of Abraham et al. (2006), is reported in tandem with explicit support from coaches as reflecting their role. The coaching model of Côté et al. (1995) may also possess a similar level of validity in that it was built from the responses of coaches but these elements were never presented back to participants for validity checking. However, irrespective of these issues, there is probably now sufficient data to suggest that neither of these models are doing enough to reflect the multi-dimensional nature of coaching as presented here.

Since current models are not good enough (in the absence of evidence to the contrary), an alternative solution is needed. Typically, mental models have been developed through understanding 'expert knowledge' via the use of Cognitive Task Analysis (Militello & Hutton, 1998). The assumption being that if experts are selected and their naturalistic (often tacit) practice unpacked, an understanding of the demands of the role and the perceptual and decision making skills required to become expert can be mapped. Given the breadth of research reviewed here I would suggest that a broad task analysis can be inferred and concluded in coaching and that this research has sufficiently exposed the tacit and explicit elements of coaching such that a new coaching model can be developed. Consequently I offer a new model in Figure 2.1 as a basis to structure and guide research into coaching practice and also to be used by coaches and coach educators as an initial mental model to scaffold their practice. In

doing so I acknowledge that this new model is ripe for adaptation or rejection through relevant testing, just as *should* have been applied with others to date.

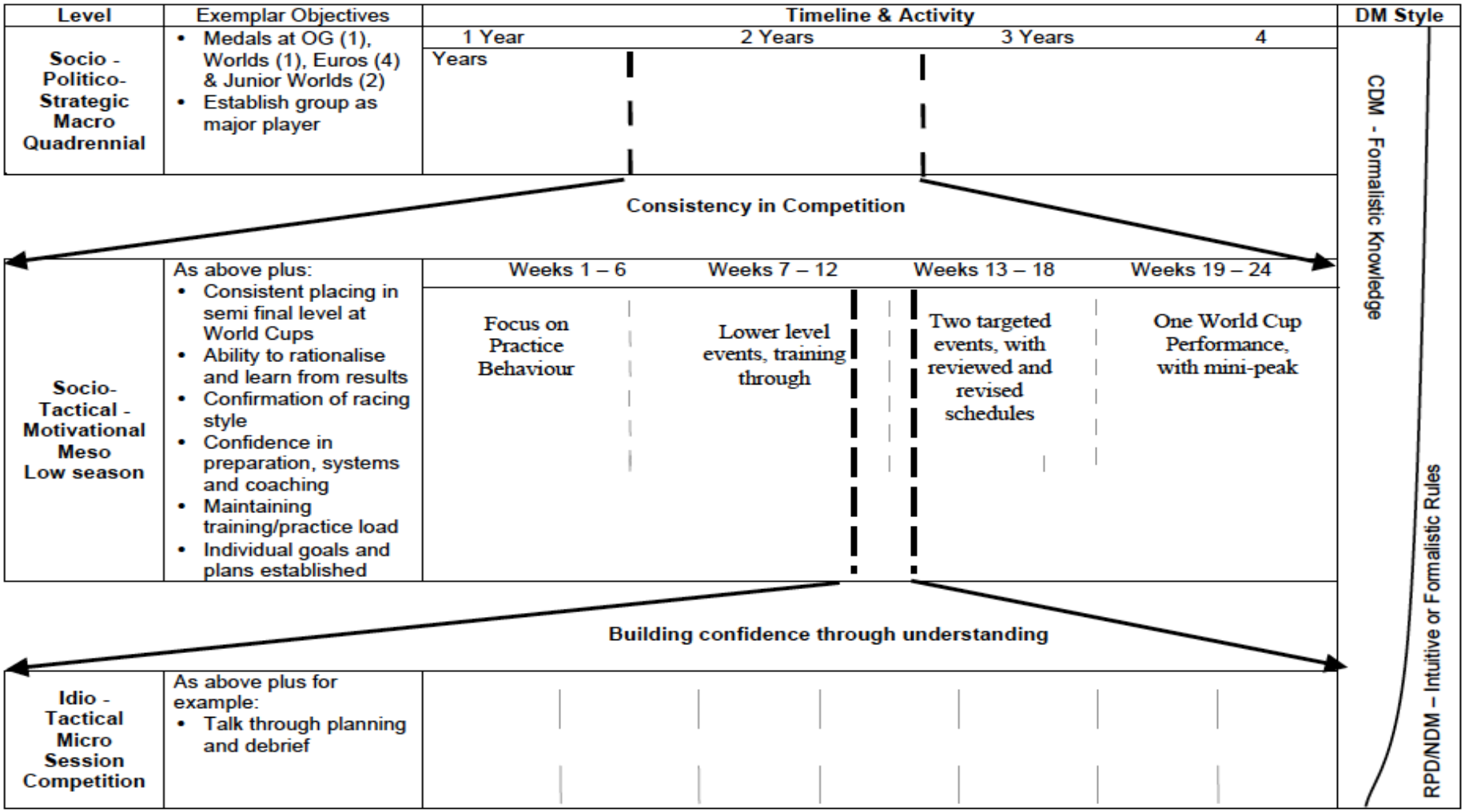

Figure 2.1. The Nested Model: An approach to guiding classical and naturalistic decision making. In this instance high performance sport provides the context; differing contexts would/could lead to differing objectives, timelines and content.

2.11 ANSWERING THESE CHALLENGES THROUGH NESTED GOALS, PLANS AND DM BALANCE

Considering the 'evident need' for an NDM/CDM balance based on the ideas presented here five principles become evident;

I. Coaching environments encompass pedagogical, social *and* socio-political contexts that require decisions to be made, where possible against 'external criteria', on how to interact with and influence (and be influenced by) various stakeholders.
II. NDM (or at least good NDM) grows out of off-line pre-mortems, cognitive experimentation (c.f. Schön, 1991), critical planning, debriefs and reflections which consider critically what did and didn't work and which feeds into the next NDM situation. In short, NDM is 'grown' by off line debate, practice and thinking, with this thought being both situation-specific and generic. As such professional development programmes will need to offer such opportunities if these skills are to be developed and transferred. This will require a shift in the formal coach development practice.
III. The environment *must* employ CDM and NDM at different times and under different circumstances (e.g. in strategic long term versus annual versus session planning). However, this 'blend' is almost never 100% CDM or NDM.
IV. This 'blend' principle applies to *all* components of the coaching environment, although other constraints will determine the balance for any particular challenge.
V. Irrespective of whether CDM or Rule Based NDM is employed, it should wherever possible draw on formalistic knowledge sources that are embedded within a rich experientially grounded mental model.

The basis of the model in Figure 2.1 is that coaches engage in nested thinking, (an idea originally offered but unexplored by Abraham et al., 2006) where decisions taken at a micro level are embedded (nested) within medium term agendas which themselves are linked to (nested within) longer term aims. As such, naturalistic decisions are explicitly linked to decisions taken at a more classical level when time is available to think through ideas. This acknowledges the following principles;

- that the balance of classical to naturalistic decision making changes as a result of the environment and the level of thinking time likely to (or that at least should) exist. It also acknowledges the political, social and pedagogical demands;

- that the knowledge required to think and operate at each level changes in subtle ways from more formalistic sources of declarative knowledge to more interventionist formalistic procedural rules to reflect the demands of the situation;
- that tacit and substantive knowledge use is inevitable but that the focus should be on formalistic knowledge wherever possible;
- that this approach reflects a feed forward critical thinking process *and* a critically reflective feedback process so that the whole process is dynamic and flexible.

2.11.1 The Socio-Political-Strategic Level (Macro)

Reflecting these principles, coaches should critically consider the required strategic socio-political goals of their work: for example, defining key educational and health goals for the children's coach, defining retention, transition/progression skill expectancies for the talent development coach, or managing upwards on performance expectations for the performance coach. Once these are identified, further parameters include who will need to buy into them, how they are communicated and who they will need to be communicated to. In taking this stance, coaches can be proactive in developing a socio-political environment that meets their needs rather than just 'tolerating constraints' that they have had no input to and/or control of. Indeed, operating at this level of policy making is seen as being a vital component of being a 'professional' by Downie (1990). Given such planning is fundamental to achieving long term goals, I suggest that this should be a predominantly CDM process to which a good deal of time should be allocated. However, this does not mean that there won't be some element of NDM occurring; this is inevitable in any form of planning process. Furthermore, as a result of critical reflection, quick changes to long-term plans may be needed.

2.11.2 The Socio-Tactical-Motivational Level (Meso)

Once the Macro level of goal setting and planning is agreed, the coach can then begin to work towards goal setting and planning for the socio-motivational and tactical environment that will be required for macro goals to be achieved. While this level of planning would likely focus on developing the environment required to support athlete development and/or achievement, it can equally focus on creating the right environment for parent and assistant coach buy in. If self-determination is so important for intrinsic motivation (Deci & Ryan, 2008) then the self-determination of all those with an active involvement in enabling the development of athlete needs to be planned for (Pensgaard & Roberts, 2002; Weigand, Carr, Petherick, & Taylor, 2001). It is here that

I believe annual planning for athletes fits since the major goal of this approach is to develop self-determination and ownership for the athlete; it also allows for coaches to consider optimal methods for engagement. The tactical element of planning here is not necessarily just about approaches to game play but is inclusive of hitting important performance and development markers that 'evidence' progress to anyone with a vested interest. It is interesting to note that this 'correct environment' approach is a typical marker of excellence in teaching where specific plans address the initial rigors of teaching new classes so that more meaningful relationships with students are established within agreed behavioural guides (Fink & Siedentop, 1989). Once again, I suggest that this process needs to be a predominantly CDM process where ideas are challenged and thought through by active agents (coaches and senior players for example). Since this level of planning is closer to the realities of practice it will probably be more influenced by day to day reflections, necessitating a NDM process that tweaks goals as progress is reviewed.

2.11.3 The Idio-Tactical Level (Micro)

Finally, the micro level of planning and delivery directly reflects an approach focused on implementing meso targets. Typically working with individual athletes and/or groups of athletes focused on sport specific targets this can also be with significant others in meetings and day to day interactions. At this level, coaches are obviously expected to respond to situations as they arise, so NDM becomes much more prevalent. However, as a result of taking a nested approach and premorteming possible challenges, the coach is better prepared to both make naturalistic decisions *and* more able to recognize when a heuristically made decision may be too biased and needs some level of externally referenced critique. It is here that coaches really start to learn how to cope with the 'swampy lowlands' of practice because they are able to learn the difference between expert heuristic NDM and novice heuristic guess work.

2.12 CONCLUSION: WHAT NEXT?

In delivering this chapter I have presented an overview of coaching research drawing out the similarities and agreements identifying that coaching is a decision making endeavour (Abraham et al., 2006; Jones & Wallace, 2006; Lyle, 2010), is nested in nature working to various levels of goals and involves working with various stakeholders toward a variety of goals; social, political, performance, individual etc. (Abraham et al., 2006; Jones, 2007; Jowett & Cramer, 2009; Potrac & Jones, 2009; Weigand et al., 2001), and which demands that coaches work in both naturalistic and classical ways. I have presented PJDM, through the theory CDM and NDM (or Type 2

and Type 1 DM) and philosophy of professionalism, as a unifying theory that is sufficiently parsimonious to act as an umbrella theory for process of coaching practice since it seems to allow for the application of all epistemological positions. Finally, I have offered a model that summarizes the application of differing perspectives within a nested approach accounting for the differing use of CDM and NDM. I believe this model and the aligned PJDM theory model offers a scaffold to guide and investigate and understand coach education practice, coaching practice and future research. I should highlight however, that the application and understanding of this model will ultimately be limited by practitioners' engagement with underpinning theory. In keeping with the theme of this chapter the model is *not* a black and white answer; rather, it is a structured entry to navigate the coaching (and therefore coach education) process – a formalistic rule (Yates & Tschirhart, 2006) to guide rather than restrict.

Despite the evidenced review of coaching presented here, the developed PJDM view of coaching and the associated model for practice, there is still a need to explicitly test the explanatory power of the underpinning theories and ideas contained within this chapter. Ultimately therefore, the goal of this chapter was to set a theoretical framework and benchmark from and against which the remaining chapters could progress. As such, against this benchmark chapter 3 will go on to examine diagnostic and prescriptive decision making processes employed by a group of long jump coaches.

CHAPTER 3 PJDM: TO JUMP OR NOT TO JUMP

3.1 OVERVIEW

In the preceding chapter the key theoretical concept of PJDM was unpacked and explored as a parsimonious theory against which coaching could be examined. As such, I argued that there were times when a coach would be better served engaging in more classical problem solving and decision making. Alternatively there would be times when they would be better served drawing on more intuitive naturalistic approaches. Further to this stance I argued that, in their position paper, two of the most prolific researchers in this field, namely Kahneman and Klein (2009), agreed that decision making could become biased and flawed through overconfident reliance on and application of heuristics to solve problems and make judgements. Such overconfidence would be born out of thinking that a swift naturalistic judgement and decision can be made based on experience when, in fact, a more thoughtful classical approach should be taken. It is in this space of flawed judgement and decision making that I believe more can be learned about coaching practice and, by association, the development of coaching practice.

Numerous researchers within coaching have identified problems of coaches making judgements based on *folk pedagogy* (Abraham & Collins, 1998; Gould & Carson, 2004; Partington, Cushion, & Harvey, 2014). The suggestion being that, while this folk pedagogy may have value, its experiential source often means it is without theoretical or critical basis. As such folk pedagogy has clear links with the view on substantive knowledge from Yates and Tschirhart (2006). Such a position has consequences for identifying coaching practice through the lens of PJDM. If coaching is to be viewed through a professional lens then certain benchmarks must be applied. As previously discussed, both Carr (1999) and Downie (1990) have identified that professions are defined by their recourse to theoretical and/or empirical knowledge in making judgements. Furthermore, that this practice is checked, monitored and informed by a critically informed peer group. As such, if coaches are too reliant on folk pedagogy in their practice then their capacity to be professional becomes open to question.

Further to professional judgements being made against identified criteria, professional judgements should also be fundamental to coaches' improvement. If judgements are critical and evidence based they should also create learning opportunities, especially if the coaching problems to be solved are novel and, at least somewhat, unknown. In other words, professional judgements should encourage exploration of new ideas and interaction with critical others (Stoszkowski & Collins, 2014). The question that

remains, therefore, is does the reality match the hypothesised ideal approach? Do coaches engage in PJDM in all of their decisions?

3.1.1 Summary and Research Questions

Taken in combination, the theoretical and conceptual approaches presented in the previous chapter (summarized in Table 2.1) offer a view on how coaches *should* make decisions, drawing on different mental resources and processes that are dependent on the context within which they are made. However, as North (2013) states, there is relatively little data within coaching to explore or support any of these views. This missing support is important for three reasons. Firstly, if we don't know how coaches are making decisions we cannot accurately define coaching practice and whether it is professional or not. Secondly, if we can't define coaching practice we can never be sure if we can identify, measure or assess coaching practice or its effectiveness (notwithstanding the external factors which will impact on this). Thirdly, without understanding how coaches are making decisions, or are getting better at making decisions, it is difficult to know if proposed or actual educational processes and professional development guidelines are fit for purpose.

Reflecting these assertions, the study presented in this chapter aimed to explore the DM processes used by a group of experienced athletics coaches in the discipline of Long Jump when analysing, diagnosing and prescribing the needs of a single long jump athlete. Furthermore, drawing on Yates and Tschirhart's (2006) view that "people resort to formalistic procedures only when they can't use substantive ones, which are much more natural" (p.433), the study also aimed to explore what coaches would do when presented with uncertainty regarding their judgements. In taking this approach, the following research questions were developed:

- What approaches to JDM do coaches take when presented with a contextualised real-world coaching problem?
- What knowledge sources do they draw on?
- How do coaches respond when placed in position of uncertainty?
- If there are differences, what knowledge sources do they then draw on?
- What conclusions can be drawn regarding the identification, measurement and evaluation of coaching practice?
- What conclusions that can be drawn regarding examining relevant educational processes and professional development guidelines?

3.2 METHODS

3.2.1 Participants

Participants were 12 British and Irish athletics coaches (all male; mean age 43.2, sd =3.6; mean years coaching 11.2, sd= 3.8), recruited by personal contact. All had coached athletes to at least national level (participation of at least one athlete in at least one national championships) in a horizontal jumps event. At the time of the investigation, all were actively coaching. All participants were assured of confidentiality and provided informed consent.

3.2.2 Methodological Approach and Stimulus Instrumentation

In order to gain results to facilitate answering the stated research questions it was clear that I would need to access the cognitions of the coaches when they were required to make decisions. Two broad factors were considered in developing the methods to be used. Firstly, cognitions related to judgement and decisions with practitioners would need to be captured through a meaningful context. Abraham et al. (2006) identified that, in order to access meaningful cognitions with coaches, they must be engaged with a context that allows them to be in a the mental model mindset referred to in the previous chapter (Entwistle & Martin, 1994). This would ideally mean engaging a coach within and about his or her own coaching context. However, such an approach makes it difficult to control for within-group variance and develop results that are comparable across the group since each coach's context is unique. Consequently, a middle ground is needed, where a single context is developed that allows for comparisons to be made across a group yet is still meaningful enough to elicit relevant responses. Examples of such approaches in coaching research have been relatively rare in recent times although the method had some popularity in the past and was successful in examining diagnostic skills in swimming coaches (Rutt-Leas & Chi, 1993) and planning behaviours in basketball coaches (Jones, Housner, & Kornspan, 1995). More recently, the use of stimulus or simulation based approaches has been recommended by Gore & McAndrew (2009) as a method for accessing cognition in practitioners. Given the questions that this study was trying to answer, employing this methodological approach was deemed appropriate.

The second consideration was whether to use a think aloud protocol, an open ended inductive interview or a more focused deductive interview. All three methods are described as being relevant for accessing DM based cognition by Gore and McAndrew (2009). Given the very clear goal of the research questions and the theoretical

principals being tested I decided to apply the more deductive approach to interviewing the participants. However, and in keeping with research approaches of Abraham et al., (2006) influenced by the ideas of Miles and Huberman (1994), an initial inductive assessment of the data was completed before the deductive phase to ensure that all relevant data was extracted from the interviews. Relevance was judged on as being relevant to the questions asked. More detail on the deductive analysis is offered in section 3.2.4.

In keeping with this contextualised, deductive approach, therefore, participants were presented with film (8 jumps at various venues and of various distances) plus competitive records and training data on a "US varsity level" long jumper, age 20 and with a Personal Best (PB) of 8.05m. In fact, the stimulus was a conglomerate of several similar North American athletes, assembled in consultation with two NCAA Division 1 athletics coaches to generate a consistent picture of a "good, up and coming athlete", based on the standards prevailing at that time.

3.2.3 Procedure

All participants received the information pack at least five days in advance. Furthermore they were made aware that they would be asked about their thoughts relating to the following areas:

- Their evaluations of the athlete's strengths and weaknesses.
- Their main aims for his immediate future development.
- Some exemplar activities that they would employ.

They were then interviewed in a single data collection session (lasting between 45 and 70 minutes) covering two stages. Under the *first stage*, a broad set of questions, outlined below, was asked. Following each original question and answer, follow up probes and prompts were used in order to ensure that a complete description was given. The probes and prompts were based on the ideas presented in Table 2.1 to explore approaches to judgement and decisions. Furthermore, probes and prompts about strengths, weaknesses, and activities were based on the *Understand Sport, Athlete* and *Sport* domains of knowledge identified in section 2.3.1.

- Having viewed the film and records of this athlete can you talk me through what you believe the strengths and weaknesses of the athlete are?
- Can you talk me through how you decided on these strengths and weaknesses?

- Can you tell me what you would choose to work and where you would focus your efforts in early stages of working with this athlete?
- Can you talk me through why you would start there?
- Can you tell me what sort of activities you would engage in to work on the aspects that you have chosen?
- Can you tell why you would use that activities and where those activities came from?

In the *second stage*, and in order to introduce the element of uncertainty, participants were told to imagine that this diagnosis and treatment was not working and to reconsider what else they would do, using the same structure as in the first scenario. At this stage, two participants observed that this "simply wouldn't happen" and refused to complete the second scenario. Both were removed from the investigation.

3.2.4 Data analysis and member checking

Data were transcribed and analysed using inductive analysis (Côté, Salmela, Baria, & Russell, 1993). The inductive analysis was completed by a highly qualified athletics coach and experienced coach educator who was familiar with the sport and the event. This coach was asked to identify key factors in relation to the three bullet points presented in Section 3.3.3. The coach was further asked to identify what he thought were the key rationales provided by the participants. A third researcher who was blind to the underpinnings or purpose of the investigation completed a further inductive analysis of a 10% sample of all of the interviews (i.e. selected single pages of transcriptions representing both the initial and follow up uncertainty responses). A confirmatory debate on all unclear issues was held between the coach and the third researcher.

Finally, I completed a deductive analysis of the original inductive analysis. Initially this involved an analysis of the first stage responses largely against the PJDM, Decision Modes and Knowledge Source ideas contained in Table 3.1. Subsequently, a further similar deductive analysis was completed on the second stage responses. However, in addition to ideas included in Table 3.1, stage 2 responses were also deductively analysed against the ideas outlined in the RAWF model identified earlier. Summary data on their responses and the research team interpretation of them were subsequently sent to all ten remaining participants. All expressed their approval that the descriptions offered were a genuine reflection of their thinking and reasoning.

3.3 RESULTS AND DISCUSSION

In keeping with other similar qualitative research (e.g., Thompson, Bezodis, & Jones, 2009), it was deemed most meaningful to present results and the discussion of results in the same section since it is difficult to present results without aligned discussion.

Against the purposes of the investigation, results are presented focused on the perceptions, intended actions and reasoning reported within a cognitive demands table that is “a means of merging and synthesising data” (Gore & McAndrew, 2009, p.219). Results from the ten participants who completed the whole investigation are presented in Tables 3.2 and 3.3. In all cases, the primary reasons and actions reported by each participant coach are presented; that is, the one they and the analysing coach felt was the most important rather than the one which they said first. Aligned with these responses, a deductive view on the approaches to problem solving and DM used by the coaches are presented in the final column.

Reflecting the expected application of NDM style approaches in the first instance, participant responses in Table 3.2 display a personally orientated, substantive approach. My deductive alignment of response to substantive as opposed to formalistic structures is made on the basis of the intuitive application of heuristic problem solving procedures to both diagnose and evaluate their course of action. For example, justifications for the diagnosis made and the actions suggested are almost all exclusively grounded in “my experience tells me...” and “this looks like when....” style explanations. Similarly, evaluated courses of action reflected this *in my experience* approach. There was limited similarity between the coaches, resulting in some level of clustering, i.e. those who thought the issues for the athlete were technical against others who thought the issue was one of strength and conditioning. However, the results in Table 3.2 are probably more defined by their apparent inter-individual variability reflecting their diagnosis and evaluation. In short, I suggest that responses were personally and substantively orientated, based almost exclusively on the coach’s immediate intuitive perceptions and application of athletic folk heuristics. This approach aligns mostly with a Type 1/NDM process with some Type 2 diagnosis and evaluation but that these largely drew on intuitive, substantive heuristics as opposed to a formalistic and analytic approach.

Interestingly, however, when pressured by the manipulation and placed in a position of uncertainty by suggesting that their initial diagnoses/plans were not working or even incorrect, participants spontaneously assumed (i.e. assumption based reasoning from RAWFS referred to earlier) a “back to basics” approach. This approach was almost

identical across coaches and reflected a greater reference to a more formalistic knowledge that was, apparently, aligned with deterministic modelling identified as being required for a detailed view on key components of the long jump and the role of focusing on the take-off (cf. Graham-Smith & Lees, 2005).

Notably, the response to the uncertainty manipulation resulted in all coaches talking about the need to reduce uncertainty by acquiring more information;

> "I'll need to take a longer slower look at the key parts of the event". (Coach 2)

This more thoughtful analytic approach was also supplemented by a strong desire to get the opinions of other coaches to support the diagnostic view;

> "Checking with other coaches also helps to check that you are on the right track" (Coach 3)

> "If in doubt watch some more, usefully with another coach and a camera" (Coach 6)

Of further note was that only Coach 8 stayed with his original diagnosis, although accepting that what he had done must be at fault if no improvements had taken place. This is of note since this was the only participant who seemed to engage a more formalistic needs analysis approach in his response to the first stage of the method.

Coach	Diagnosed athlete profile	Rationale	Evaluated Course of Action	Rationale	Deductively Aligned DM Approach
1	"Very powerful, good speed"	"He's like my athlete XXXX. Similar flat speed figures, just jumping further"	"I'd like to work on his attack at the board ..get more of that power translated into distance."	"That was what worked for XXX. He really benefitted from that focus. This guy is very similar."	NDM – Intuitive Diagnose Draws on Substantive knowledge
2	"I like this guy's consistency. He has a good rhythm on the run-up. He doesn't seem to foul much."	"In my experience, getting the run-up right is the most important factor. So long as he's powerful enough, everything else will follow."	"Get him in the gym more. He looks the part but I would like to get his power up so he can work his technique to best advantage."	"Once you've got the consistent technique, it's all about how much power you can put down."	NDM – Intuitive Diagnose Draws on Substantive knowledge
3	"Needs even more speed….pur e and simple"	He reminds me of YYYY (*coach's former athlete*). A strong boy but we just need to get him faster on the runway."	"A hard winter working on speed should do it. Whenever I take on an almost mature athlete, that's always my first action."	"I've always had success with this method. I expect it to work here as well."	NDM – Intuitive Diagnose Draws on Substantive knowledge
4	"A focus on his running mechanics. He needs to be quicker and smoother on the approach."	"My experience in biomechanics tells me by eye that the approach is this athlete's weakness."	"Use of video feedback as we work on his technique."	"As I said before, it's the approach I use."	NDM – Intuitive Diagnose Draws on Substantive knowledge. Some evidence of recourse to formalistic knowledge.
5	"Greater core strength. He looks like he folds a bit on take-off so all his speed isn't converted."	"Conditioning is paramount for this event. In my experience, you cannot neglect this."	"Hard work through the winter….miss the indoors and push for a stronger athlete into next summer's events."	"I've found that they take a while to convert to my ways of thinking. Going for an indoor season is just too early."	NDM – Intuitive Diagnose Draws on Substantive knowledge. Some evidence of recourse to formalistic knowledge.
6	"He looks very ragged in the air…he's losing centimetres there."	"I've found that good control in the air is a really important factor"	"I want to work on his control, both at the board and in the air".	Seems strong and quick. The technique is where we are going to get most return."	NDM – Intuitive Diagnose Draws on Substantive knowledge.
7	"I'd want him quicker on the runway.	"I have a model for my athletes that I have built up	"Speed and acceleration work through the	"Because it always has!"	NDM – Intuitive Diagnose

Coach	Diagnosed athlete profile	Rationale	Evaluated Course of Action	Rationale	Deductively Aligned DM Approach
	He takes too long to get up to speed and he's rocking at the start."	over the years. That's what I want to see."	winter….that will work."		Draws on Substantive knowledge.
8	"The secret is at the board. He's clearly fast and powerful, got all the equipment."	"Like I said, the whole event is about the take-off. All my athletes have worked hard to make this their strength."	"The last few strides into the board; start slow and accurate then pick up the pace then pressure test."	"I see this guy as like WWWW (*past athlete of this coach*). Get that right and all the other bits and pieces will fall into place.	NDM – Intuitive Diagnose Draws on Substantive knowledge. Some evidence of recourse to formalistic knowledge.
9	"Needs to be better in the air. He doesn't seem to know where he is."	"Most athletes, especially the big strong ones, will benefit from work on their control."	"Maybe some trampoline or box work…take him back a bit then rebuild."	"It's what I have seen work in the past."	NDM – Intuitive Diagnose Draws on Substantive knowledge.
10	"You can see he's rotating off the board….his approach needs work."	"He looks like AAAA. Same rangy untidy action. Can't hitch kick. Same issues"	"A complete rebuild of his approach is needed. Same sort of programme as I used with BBBB."	"I've seen quite a few athletes like this in my time. This fella is quicker than most but still it's the same solution needed."	NDM – Intuitive Diagnose Draws on Substantive knowledge.

Table 3.1. Summary of the key cognitions of the ten participants relating to their response to the initial stimulus asking for perceived view, aims and actions with associated rationale. The final column reflects the deductive analysis to aligned judgement and DM approach.

Coach	Diagnosed athlete profile	Rationale	Evaluated Course of Action	Rationale	Deductively Aligned DM Approach and Method of Coping With Uncertainty
1	"If that hasn't worked then we need to look at his contact with the board. Work on basics around the take-off."	"Most of the things I've read suggest that the event comes down to that….so we have to focus on take-off."	"So I'd still be working on his attack into the board but with more of an accuracy focus.	"All the greats are really strong at this facet. If we can get it right with this guy, it's bound to have a positive impact."	NDM – Assumption Diagnose Recourse to Formalistic knowledge. Dealing with Uncertainty: R & A
2	"My next step will be to check what is happening at take-off."	"All the coaches who write about the event stress this. It's where everything works from…..or doesn't".	"A detailed breakdown of action at the board….looking for consistent trends, both good and bad."	"This is like….like back to square one. I need take a longer slower look at the key parts of the event."	NDM – Assumption Diagnose Some evidence of plans for CDM reflection. Recourse to Formalistic knowledge Dealing with Uncertainty: R & A
3	"Well if making him quicker isn't transferring into performance , we need to go back to the take-off."	"If you look at all the great athletes, they can hit the board consistently. That's what all the books talk about."	"Let's watch his last few strides, over and over, and look for trends. What is his placement, what can we tweak."	"When your ideas don't work, its back to basics. Checking with other coaches also helps to check that you are one the right track."	NDM – Intuitive Diagnose Some evidence of plans for CDM reflection. Recourse to Formalistic knowledge. Dealing with Uncertainty: R & A
4	"I would want to recheck my data. Have I got enough in the first place? Have I got the right angles and so on."	"If the initial analysis is not working then we need to check back, in slower time."	"If we can get slow motion at the board, that would probably unlock the solution."	"A second, more careful evaluation. Make sure we got all the relevant points."	NDM – Assumption Diagnose Some evidence of plans for CDM reflection. Recourse to Formalistic knowledge. Dealing with Uncertainty: R, A & W
5	"If it isn't core strength then it is certainly something at the board".	"Whenever us coaches get together, we always talk about what happening at take-off. That seems to be a consistent idea."	"I would want to get some external views on this…some filming and analysis, some other opinions."	"If my approach isn't working, it is surely sensible to get some others at the problem."	Some suggestion of CDM NDM – Intuitive Diagnose Recourse to Formalistic knowledge. Dealing with Uncertainty: R, A & W
6	"Right then…back to basics or, more properly, where it all starts. At	"The logical place to start is at the initiation of the problems I picked up previously."	"I need to see more jumps…to be around the guy and watch carefully what is going on at	"If in doubt, watch some more. Usefully with another coach and a camera."	Some suggestion of CDM NDM – Intuitive Diagnose Recourse to Formalistic knowledge.

Coach	Diagnosed athlete profile	Rationale	Evaluated Course of Action	Rationale	Deductively Aligned DM Approach and Method of Coping With Uncertainty
	take-off."		the board."		Dealing with Uncertainty: R, A & W
7	"I think my first step in that case would be to look at the last few strides."	"Given that making him quicker hasn't helped, all the books and training would tell you to go back to the take-off."	"A real in-depth examination of his take-off. I like sitting with other coaches…asking what do you see? It's almost like I want to get a check on my thoughts."	"If in doubt, its got to be good to get another view."	Some suggestion of CDM NDM – Intuitive Diagnose Recourse to Formalistic knowledge. Dealing with Uncertainty: R, A & W
8	"Look…I can't change my previous evaluation. He just has to get more accurate at the board."	"That's the event…right there. It *has* (*participant's emphasis*) to be the concentration."	"Needs much the same emphasis but just different approaches."	"I know the focus is right. If this isn't working then I guess I'm going about it the wrong way."	NDM – Intuitive Diagnose Some Recourse to Formalistic knowledge. Dealing with Uncertainty: R & A
9	"I want to look at take-off then….go back to where his flight issues are coming from."	"If you look at where the problems are coming from, with more care. That's the way to solve problems."	"I'd like some video in slow motion on his work around the board."	"If in doubt, back to basics. Everyone knows that take-off is pretty key."	Some suggestion of CDM NDM – Intuitive Diagnose Recourse to Formalistic knowledge. Dealing with Uncertainty: R, A & W
10	"Let's stay with the last few strides into the board and work on that".	"It seems sensible to try and work back to where the problem starts or finishes. That's on the take-off."	"Many heads are better than one. Let's get a few different opinions on what is going on".	"Each of us will have a different viewpoint. We can learn from each other's perspectives."	Some suggestion of CDM NDM – Intuitive Diagnose Recourse to Formalistic knowledge. Dealing with Uncertainty: R, A & W

Table 3.2. Summary of the key cognitions of the ten participants relating to their response to the secondary stimulus when uncertainty was introduced but continuing to ask for perceived view, aims and actions with associated rationale. The final column reflects the deductive analysis to aligned judgement and DM approach. An additional deductive view is taken on which RAWF method is used in response to the introduction of uncertainty.

Against the review and summary of the main results offered, answers to the specific research questions become available.

- *What approaches to DM do coaches take when presented with a contextualised real-world coaching problem?*
- *What knowledge sources do they draw on?*

Evidence presented here is that the coaches' initial problem solving and decision making followed a naturalistic response. There was some evidence that the choice of approach was intuitive, i.e. there was an immediate application of a heuristic to solve the issue that was directly attributed to *in my experience*. However, this application was apparently to engage mental modelling that both diagnosed how the athlete had arrived at their current status (i.e. second level RPD: diagnose the situation) and then evaluated a matched course of action (i.e. the third level RPD). It is of interest that there was no obvious doubt in the mind of any of the coaches that the intervention would work. So, while there was some explicit thought about how the athlete had arrived at the situation the coaches were presented with so that the second level of NDM was initiated, there was no evidence of them thinking through the consequences of various interventions before deciding on which to take. In short, there was an apparent confidence in the creating a course of action based on a diagnosis that drew on an intuitive application of mental models. Such an approach would be in keeping with work examining expert performance where the conditions of a problem are recognisable and match with known interventions and ways of working (Lipshitz et al., 2001). It is interesting that there was no obvious attempt to evaluate the course of action identified by the coaches. This may well be a sign of confidence (maybe even overconfidence) exhibited by the participants, as would be expected of coaches at this level.

From a knowledge source perspective, the coaches seemed to have relied on substantive problem solving heuristics to offer a view on what they were perceiving. As mentioned earlier, the views offered differed across the coaches and probably reflected pet opinions and views that immediately came to mind. This would be reflective of the application of the availability heuristic as defined by Kahneman (2011). This is a phenomenon that is observed when humans intuitively go to the *answer* that immediately comes to mind, without Type 2 processes being implemented to check judgement, even when the opportunity exists. This would point directly to a lack of professionalism (as previously defined) in judgement and DM, and is reflective of the reality already noted by Yates and Tschirhart (2006) that people will select substantive knowledge ahead of formalistic knowledge when possible.

Given the processes at work here, there is a strange phenomenon occurring where the DM behaviour of the coaches is similar to experts in other fields, yet the behaviour seems to display a lack of professionalism. Of course, this may be an artefact of the methodological approach since there was no great pressure to defend or think through the interventions suggested. Equally, however, there was nothing to stop the coaches implementing a level of self-control[4] (Kahneman, 2011) to check their answers before verbalising them.

- *How do coaches respond when placed in position of uncertainty?*
- *If there are differences, what knowledge sources do they then draw on?*

The manipulation of introducing uncertainty in this study produced results that were in keeping with what might be predicted from the theoretical ideas offered in Table 3.1. There was an initial assumption of what the problem might be by all but one of the coaches. This led to a strong consensus that there was a need to examine what was going on at the take-off board. While only some coaches shared a view that "all the books and training would tell you to go back to the take-off" (Coach 7), the fact that this was a common theme would suggest a shared formalistic rule of how to go *back to basics*. Furthermore, there was an explicit identification that this recourse would lead to attempts to gain further information to further understand the problem that was occurring. Notably, both assumptions and reducing uncertainty by collecting additional information are predicted strategies of RAWFS (Lipshitz & Strauss, 1997).

These approaches would still align with the RPD model. For example, there is an intuitive rule applied (stage 1), an attempt to diagnose the problem (stage 2) and steps taken to evaluate a course of action (stage 3). This explanation is consistent with Klein's view that Type 2 deliberative thinking is being engaged. However, an additional more analytical focus is suggested through more considered data collection methods, i.e. video use, *and* the view that discussions should occur with other coaches. In short, under this level of uncertainty the coaches are interested in going beyond searching for the first available idea, instead wishing to explore options available to them and willing to do so through checking ideas with others. This level of analysis would seem to have more to do with the analytical, deep reflections identified by Yates and Tschirhart (2006) and Schön (1991).

[4] This term is used deliberately by Kahneman as being a feature of people who are willing to engage Type 2 systems to deliberately check the intuitive answers or answers arrived at as a result of the application of intuitive heuristics, i.e. the availability heuristic.

I have already identified that the coaches seemed to progress to drawing on formalistic rules that link with deterministic modelling. However, the response of coach 8 referred to earlier, offers an alternative that is worthy of exploration. While this study did not explicitly go into depth to explore the knowledge streams that the coaches were using to analyse, there are some inferences that can be made. Abraham and Collins (2011) identified three broad domains of knowledge that coaches can draw on when engaged in skill development activities;

- Understanding of the performer.
- Understanding technique and tactics.
- Understanding of teaching and learning environments.

Examination of the responses in Table 3.2 and returning to the response to research question 1, suggests that the coaches are implicitly drawing in ideas that would align with their understanding of the athlete (based on what could be gleaned from the information they were provided with) *and* of the sport. It is noteworthy therefore that, when the pressure of uncertainty is added, the coaches become more focused on drawing upon their explicit understanding of the sport (i.e. the strong focus on what is happening at the board). It could be argued that becoming more deterministic would probably lead to considering the athlete as well, but in a more analytical approach. What becomes apparent is how the majority of coaches do not seem to draw on the learning and teaching knowledge stream, and this would be consistent with previous research in this area (Abraham & Collins, 2011). It is here that Coach 8 bucks this trend by sticking with his view on the sport specific problem and focusing instead on what *he* is doing wrong. This coach went on to state that there must be a problem with the training and, given the focus of this coach's view on the take-off, I deductively aligned this reflection with the coach referring to the learning environment. As such, across the 10 coaches there is a view emerging that all three knowledge streams may be accessed during this more analytical process, although there was a definite bias towards the technical and tactical knowledge stream.

- *What conclusions can be drawn regarding the identification, measurement and evaluation of coaching practice?*

Despite the limitations of this study, the results display that, in the context offered, these coaches engaged in judgement and decision making that matched all of the ideas included in Table 3.1. The actual application of these methods was, however, dependent on the situation that the coach was placed in. Furthermore, the application of these judgement and DM processes did not seem to be alien to the coaches, or put another way, the processes used did not seem to be merely an artefact of the study

design. Accordingly, I am confident that all the processes engaged with by the coaches in this study are typical for these coaches. Thus, the evidence collected in this study lends further weight to the view that coaching is a PJDM process. In this study the process was dependent on judgements and DM that are influenced by accurate perception of the problems, the availability of matched actions, and the availability of mental models that allow rapid, yet considered judgements to diagnose situations and evaluate courses of actions. Furthermore, once these processes were suggested to not have worked, 10 of the 12 coaches immediately switched their approach to a more considered, analytical approach that followed the predictions of the RAWFS hypothesis. During these processes there was an apparent shift from substantive knowledge streams to more formalistic knowledge streams.

Against this evidence it would seem fair to say that, in order to identify coaching practice, we have to go beyond what can be observed to considering the process *that led to* what is observed (Collins et al., 2014). However, in so doing there must be an acknowledgement that at least some of this process may be tacit and difficult to access. Furthermore, given the apparent centrality of judgement and DM to practice this centrality must then flow through to measurement and evaluation of practice. However, this must also reflect the contexts within which judgements and decisions are made and therefore the manner in which they are made (Yates & Tschirhart, 2006).

- *What conclusions that can be drawn regarding examining relevant educational processes and professional development guidelines?*

Given the breadth of ideas covered in Table 3.1, there is clearly no one silver bullet that will meet the educational demands of developing coaches. Furthermore, as identified earlier, the nature of this study means that it is limited in depth of analysis, breadth of scope examining coaching practice and the demographics of the coaches involved. As such, the conclusions drawn are equally limited in their transferability. Notably, however, some commentary can be made with respect to the current industry vogue of examining formal and informal learning (Mallett, Trudel, Lyle, & Rynne, 2009; Nelson, Cushion, & Potrac, 2006). Within formal learning, making use of reflective practice (Knowles & Gilbourne, 2010) and communities of practice (Culver & Trudel, 2006) to engage with and embed formal knowledge are often seen as something of a panacea for developing coaches. However, this study would suggest that some caution should be applied.

All of the coaches appeared to identify that critical reflection against theoretical standards and engaging with other coaches would be something that they would engage in. Crucially, however, the coaches only seemed to move to this position after it

had been suggested that their initial intuitive responses had been unsuccessful. In other words, asking people to be more thoughtful may only work if the circumstances make this meaningful for the coach. Furthermore, this move to a more thoughtful approach may only occur if the coach actually recognises uncertainty in their practice; notably, the two removed from the investigation certainly didn't! It is this capacity to recognise uncertainty that may need work before reflective practice can have any meaningful impact. As such, formal methods of education that do not develop perceptual skills and expectancies in coaches but move straight to reflective learning processes may find little learning actually occurs. In short, if coaches have low (or even no) expectations of what they will see and how things will develop, they may never experience the uncertainty or surprise that would make reflecting and talking to other coaches a meaningful experience (Abraham et al., 2014).

While learning processes need to be considered, so too does the presentation of knowledge and its connection with coaches. The previously stated issue of people being unlikely to engage in formalistic knowledge unless they have to (Yates & Tschirhart, 2006) should cause some alarm to those who develop and deliver formal learning programmes. Often formal programmes like to ignore the learning that learners come with and hope that the new knowledge delivered will simply replace current knowledge and its application. This may indeed be a desired outcome, however, the nature of NDM means it is unrealistic. If new formalistic knowledge does need to replace substantive knowledge in the DM processes of coaches it must first connect with this substantive knowledge and the perceptual cues that are linked to it. Furthermore, application of this new formalistic knowledge must be able to experientially evidence that it leads to better outcomes for the coach (Abraham & Collins, 1998).

3.4 CONCLUSION

As I have highlighted through this chapter, there are obvious limitations with the methods used in this study. It may well be that, had the coaches been engaged in examining data from their own athlete, different process may have been used in the first stage of the interview. However, the fact that all but one of the coaches used a personally based approach *and* that availability-heuristic research would suggest that the approaches selected would have been commonplace for the coaches, means that these coaches may frequently engage in folk substantive rather than professional formalistic decision making.

The next issue would be one of transferability of the results to coaching in general. The processes identified here may simply be typical to the coaches engaged in this study and there are no data in this study to suggest otherwise. However, the identification and application of folk theories in different coaching and educational fields (Jerome Bruner, 1996; Gould & Carson, 2004; Partington et al., 2014) would suggest that there is a prevalence of them influencing practice. This would confirm the work of Yates and Tschirhart (2006) who note that a preference for substantive over formalistic being typical human behaviour. Indeed, the work of Dekker, Lee, Howard-Jones, and Jolles (2012) examining the belief in neuro-myths (e.g. learning styles) by qualified teachers suggests the lack of PJDM may extend far and wide.

As such, despite the limitations of the methods employed in this study, the results and my interpretation of them do fit well with concerns being expressed elsewhere; PJDM was *not* the immediate modus operandi for these coaches, and it may well be not for many other coaches. I believe, therefore, findings of the second stage of the interview offer some guidance as to how the over reliance on limited substantively underpinned RPD methods can be mitigated through manipulations of task, environment and coach education curriculum. Firstly, identifying the need for greater self-control in making decisions (Kahneman, 2011) in order to check and challenge initial ideas about the diagnostic and prescriptive ideas. Therefore, there needs to be a focus on the development of metacognitive skills with coaches. Secondly, creating a culture where coaches need to engage in peer group problem solving (in much the same way that medicine has gone in cancer care, Lamb, Green, Vincent, & Sevdalis, 2011) that reduces a coach's willingness to simply shoot from the hip is probably crucial. Such opportunities should draw on full and rich explanations of perceptions and expectations with other coaches expected to offer alternative views, i.e., creating uncertainty.

Finally, in keeping with research findings in sport psychology (Martindale & Collins, 2013) there is a need to identify theory and/or evidence based rules that can replace, or theoretically ground folk rules or be the basis of learning to engage in PJDM. For example, all of the coaches eventually referred to the need to examine what was going on at the take-off board. This is a rule that can guide PJDM, drawing on deterministic models of the long jump. Of course, coaches would also need to understand how the model is applied in the development of diagnostic and prescriptive judgements. Such an approach would be in keeping with recommendations from Abraham and Collins (1998) who suggested that coaches should be taught broad procedural rules (what and how coaching) that are aligned with underpinning declarative knowledge (the why of coaching). These ideas, along with other ideas from Chapters 2 and 4, are developed in Chapter 5.

CHAPTER 4 ON VAMPIRES AND WOLVES - EXPOSING AND EXPLORING REASONS FOR THE DIFFERENTIAL IMPACT OF COACH EDUCATION

4.1 INTRODUCTION

In the previous chapter, a position emerged that the PJDM of coaches may not always be either particularly professional or judgement based. As one would perhaps expect, there was a level of individuality in the way coaches were making decisions. However, the level of individuality in DM was reduced significantly once the coaches were placed under the pressure of uncertainty; a manipulation that led to more consistency across participants. As such, conclusions were drawn that the environment that coaches are placed within may have a major impact on how they make decisions.

Reflecting further on the findings exposed in Chapter 3, however, other ideas come to light. Ten of the twelve coaches did move to a more consistent and formalistic view on how to approach the problem suggesting that, somewhere in their developmental past, they had been exposed to these ideas and bought into them. Interestingly though, two coaches didn't go down this route; in fact, they left. Consistent with informed consent the coaches could withdraw at any point without being questioned why. Consequently, I do not know specifically why they did this, speculating, maybe they felt they were being patronised or, alternatively, they didn't have another answer? The fact they did leave left me wondering if coach education/development opportunities have the same impact on all people. It would be unusual if it did; especially at the novice level since motivation, curiosity, opportunity and maturity may mean that some never have an interest or chance to practice. However, the participants in the previous study were experienced coaches so one would assume that motivation, curiosity, opportunity and maturity wouldn't be issues. The question that comes to mind therefore is; what if they are issues and these coaches have progressed *in spite of* their approach to coach development as opposed to because of it?

4.1.1 Is it the Education Or the Coach?

There is a general acceptance within sport that quality coaching and sport science support is crucial for the development of performance. Presumably therefore, impactful education should be a central pillar of a sport's coach's or sport scientist's education, or even a government's development plan. Unfortunately, despite a burgeoning literature base and the emerging sub-discipline of coaching science, evidence for

performance impact and behavioural change from coach development interventions is sparse and, where apparent, inconclusive (Cushion, Armour, & Nelson, 2009; Krane, Eklund, & McDermott, 1991). This dearth must indicate clear issues with the quality and focus of coaching research. Returning to the ideas espoused in Chapter 2, too much of current academic investigation offers little to the evolution of practice, often focusing on descriptive theorizing (e.g., Cushion et al., 2010) without making a stance or offering an opinion on how things could and should be done to impact on coach (and thence athlete) performance. Thus, whilst some authors offer a more positive view (e.g., Stephenson & Jowett, 2009) a genuine drive to practically impact on coaching remains difficult to discern: in short, we as scientists need to do more.

Crucially however, it may also be that a failure to acknowledge and, if possible, cater for key individual differences in learning capacity that is underpinning this apparent lack of impact (Abraham, Collins, Morgan, & Muir, 2009). Coach education practice may not be completely responsible for the lack of impact on coach practice; at least some responsibility may lie with a subset of the coaches themselves.

In this regard, I suggest in this chapter that certain types of intervention, together with the research associated with them, can be extremely effective, but only with *some* coaches. Thus, while there are many issues which scientists need to address, there are also features which mean that, perhaps inevitably, some coach education practice, even though of high quality and potentially powerful impact, will fall on stony ground.

To present this contention, the chapter is structured in three parts. Firstly, I consider some important psychological research from parallel environments of adult learning and knowledge conception. These suggest that the self-schemata and development approaches that differentiate learners may underpin the differential impact that interventions achieve. In other words, why some coaches seem to be voracious in their appetite for a cutting edge, while others seem intent on impression management and engaging with development initiatives superficially, or even being deliberately obstructive. Following this, I present some data, albeit (perhaps inevitably) limited in 'face objectivity', that offers some substantiation to the proposal that individual coach's engagement may limit impact, using a cross-section of 19 high level British coaches. Finally, potential options are offered for effective coach development interventions. These options are subsequently be unpacked and explored, in addition to ideas from Chapters 2 and 3, in Chapter 5.

4.1.2 Some Theoretical Perspectives

Given that the vast majority of coach education is focused on adult learning and refining new sets of skills, it is surprising that research has not exploited the perspectives offered by literature in adult learning and education. For the present purpose, I focus on one particular underpinning approach which, I believe, has particular relevance to the education of high level coaches; a relevance which should become obvious as the implications are discussed. The approach is summarized in Figure 4.1.

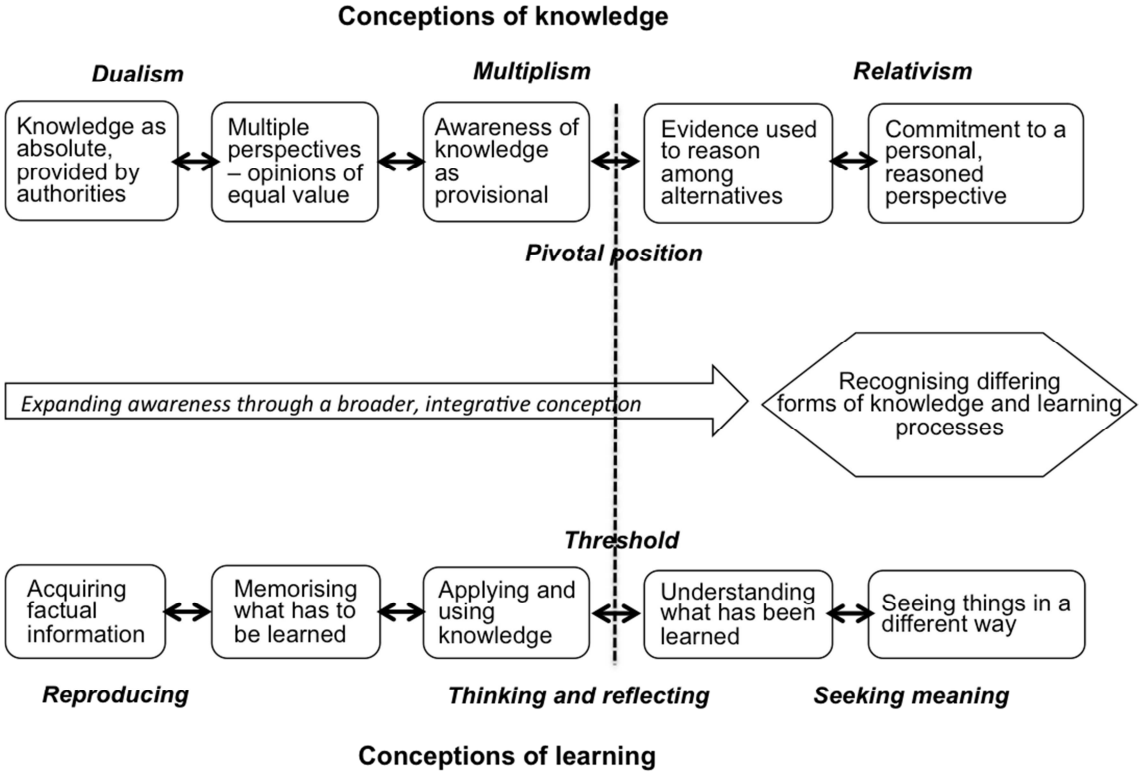

Figure 4.1 Progressions of Knowledge Use and Conceptions of Learning (adapted from Entwistle & Peterson, 2004)

Figure 4.1 presents two developmental progressions used by Noel Entwistle (e.g., Entwistle & Peterson, 2004) in his examination of student learning styles and outcomes in British Higher Education (HE). It is worth noting that, despite emanating from different perspectives, both the conceptions of knowledge (emanating from epistemology) and conceptions of learning (emanating from constructivism and cognitive psychology) offered display similar features, with important implications for the differential impact of adult education. As the upper continuum in Figure 4.1 shows, adult conceptions on the structure and use of knowledge can be viewed as a progressive continuum, from a very distinct, *black and white* dualistic and factual standpoint at one end, through to perhaps an equally distinct but very individual,

rationally underpinned, committed relativistic and meaning focused standpoint at the other. In between these two standpoints are several developmental steps, starting with a realization that there are multiple perspectives about what is fact but that these perspectives are thought to be of equal value (Multiplism). These multiple perspectives progress further to a recognition that there are times when one needs to debate between alternative perspectives in order to develop an informed and *personally owned* opinion. While such an opinion may be formed, it is comparatively easy to change when more data[5] becomes available to provide more weight to one perspective than another (Relativism).

Matched against this development of how knowledge is perceived, is a development in approaches to studying and learning by the learner (in this case the learner would be a coach) as shown on the lower continuum. Initially, learning is extrinsically motivated and focused on rote learning of externally sourced ideas, where the benchmark of correctness comes from providing the right answer to an external authority. As conceptions of learning progress, however, learners take a much deeper and intrinsically motivated learning approach where the benchmark of correctness and understanding is meaningful and critical explanations of self-practice.

Clearly, one end of both continua is more positive against the desired model of a thoughtful, innovative and reflective coach, and also more conducive to the pursuit and maintenance of that goal than the other. *Hopefully*, as a process of development, learners move from the left to the right. Based on research identifying the importance of metacognition in learning and development (Gutman & Schoon, 2013; Martindale & Collins, 2010) the process should bring about advantages in awareness (both of self and context) and an increased capacity to learn for and from professional practice.

Unfortunately, despite the obvious hope for a logical and natural progression toward thoughtful coaching, another relevant construct relating to the existence of a splitting point (identified as the pivotal position line in Figure 4.1) midway through the process suggests that this will not always be the case. In keeping with HE's aspirations and ideas of conceptual knowledge development presented above, there is a desire to help students progress from their initial very black and white factual base towards an end point of much greater relativity. Crucially, however, only *some* complete the journey (cf. Schempp, McCullick, and Sannen Mason's, [2006] thoughts on not all coaches being able to become expert), while others seem to almost *shy away* from the inherent

[5] These data may come in the form of arguments from significant others, readily accessible reading, experience etc.

uncertainty of the right side, and return to a comparatively simpler world on the left (Entwistle & Peterson, 2004), where fact is fact and we know it because we do! The work of Kahneman (2011), would suggest that a lack of ability or self-control to cope with the uncertainty may be one cause. Equally, the work of MacNamara and Collins (2010) and Entwistle and Peterson (2004) woud further suggest that a lack of drive and determination to invest in organised learning requiring an engagement between self, experience, theory and critical thinking are further potential causes. As identified in the previous chapter it is those who consistently recognize and deal with uncertainty who are more likely to progress toward and retain expertise while avoiding a reliance on biases and heuristics in their decision making (Kahneman & Klein, 2009; Lipshitz et al., 2001). This can be achieved through a mix of:

- challenging assumptions both micro (i.e. deciding why an athlete refuses to engage in practice) and macro (i.e. working out why the majority of athletes in a talent group are born in the first six months of a selection calendar);
- seeking more information, and/or;
- developing alternative understanding and solutions that are debated
- and/or creating future contingencies.

Consistent use of these approaches would be in stark contrast to those coaches who rely more heavily on making assumptions and suppressing uncertainty as their *go-to* coping strategies, thus becoming more biased in their practice.

Despite expertise being only achievable by some[6], this shying away from relativism should not be thought to condemn the learner to life as a lower status operator. In fact anti-intellectualism evidence from other domains such as nursing or social work (Thompson, 2000) suggests that those who do shy away from such an approach can become very adept (somewhat ironically!) at creating arguments for 'keeping things simple' and avoiding over complication with developing practitioners, thus limiting others' development while also saving face and make good progress in their careers. In essence, instead of progressing to being committed to a personal reasoned perspective, some become committed dualists, espousing this position as the place to be for all *practical/applied* individuals.

[6] This should not be seen as a nail in the coffin of people's ability to achieve committed relativism, research has consistently displayed that talent and an ability to develop it emerges over time (Abbott & Collins, 2004; Hambrick, 2003), this is why it is important to constantly leave a door open for later developers (i.e. the engagement of universities with adult returners is an example of this).

Reflecting these two concerns, Entwistle and colleagues (Entwistle & Peterson, 2004; Entwistle & Smith, 2002; Entwistle & Walker, 2000) set out the need for effective educational systems to both drive and facilitate the journey. He emphasises that successful progression to the higher end of each continuum is neither inevitable nor even perceived by many as desirable. This need for effective education and support becomes all the more important since data from other domains such as nursing (K. Hoffman & Elwin, 2004) suggests that, around the time the decision to really engage in critical thinking occurs (i.e., progress from multiplicity to relativism), so too does a drop in confidence in one's ability to do *the job*, since practitioners' become more aware of the uncertainty in their practice. Indeed, this shift may reflect the difficulties in moving from a beginner to proficient coach as described by Schempp et al. (2006);

> An interesting phenomenon occurs in coaching. Beginners appear to have a great deal more confidence in their knowledge and practices than do experienced coaches (p. 160).

So, not only does the notion of ideas being relative create uncertainty for the learner, this change occurs at a time when confidence in practice begins to drop simply because uncertainty is, by its nature, unnerving.

As previously identified, the link between these ideas and coach development came about because of the observation that only *some* high level coaches seem really committed to embracing new ideas, even though almost all will publicly espouse their commitment to such a philosophy. Notably, in some environments, coaches share ideas and talk incessantly with each other about the object of their passion. Consider, for example, this quote from a coach in a study by Jiménez-Sáiz, Calvo, and Godoy, (2009) reflecting on his own personal experience of development:

> We could talk for days, they were unending conversations. We had to defend and argue our theories from the rest. This taught us much about any point and many hours of knowledge construction and reflection (p. 26).

In others, however, conversation is avoided and sharing seen as selling out to the enemy: my words, but contrast the descriptions in Jiménez-Sáiz et al., (2009) with those from some of the youth sport coaches in Lemyre, Trudel, and Durand-Bush, (2007). Thus, whilst some sharing is apparent, many coaches maintain a coldly formal stance, especially if coaches are seen to be rivals:

> As coaches moved to a more competitive level, they tended to be more formal with most rival coaches, meaning they exchanged few words at the beginning

> or at the end of each game and demonstrated sportsmanship through the traditional handshake. To compensate for the absence of sharing knowledge with their rivals, some coaches observed them in an attempt to steal information. (p. 201).

This rivalry is often linked with performance outcomes, when in fact performance (win/loss) should not be a particularly high priority in youth talent development settings in comparison with player development and progression. In short, some share whilst others don't. Some innovate whilst others stand aloof.

4.1.3 Summary and Research Question

Having carefully considered the ideas included so far against my own experiences of coaches and coach development, the aim of this study was to investigate whether the face-valid and parsimonious explanations offered by Entwistle's theoretical ideas were borne out in real life. Accordingly, a short exploratory study with three sports incorporating examination of the professional development behaviours of high performance coaches was completed. The broad hypothesis being that some coaches are less likely to engage with and take ideas from formal coach development depending on their approach to coach development.

4.2 METHODS

4.2.1 Methodology

This study was set up to collect data about coaches' capacity and willingness to learn from coach education/development opportunities. Since I hypothesised that some coaches were less likely to gain as much from these opportunities as other coaches because of their lack of metacognitive capacity to deal with complexity, it was difficult to go directly to the source; namely, the coaches themselves. Impression Management (Leary & Kowalski, 1990) and attributional bias in the form of conservatism and confirmation bias (Blumenthal-Barby & Krieger, 2014) make it unlikely that coaches would readily admit this – especially to a researcher. In the absence of this form of first person data, and in keeping with research within attitudes (see Ajzen, 2001) if it was difficult to access honest/unbiased cognitions (and metacognitions): accordingly, the alternative was to observe behaviour with cognitions interpreted.

Such an approach would point to a method that included observing coaches within coach development settings. Once again, however, without access to some level of

understanding of the coach and observation over a sustained period of time it would be very difficult to get a sufficiently accurate and artefact-free picture.

An alternative option became available that allowed a focused and confidential investigation into staff (coach) development records of a group of high level coaches in three sports. Furthermore, a subjective view on the perceived level of engagement by an informed third party (either a coach or performance manager) was agreed based on strict confidentiality. Finally, tangible outcomes achieved by the coaches and typically associated with coaching effectiveness were also collected. While this indirect approach to third party data collection has not (to my knowledge) been completed in sport similar, but much larger, data trawling through records with follow up interview survey have been used in epidemiological settings (Westert et al., 2005).

4.2.2 Participants and Coach Sample

For reasons of confidentiality, both the sports and identity of the sample coaches are anonymised. A sample of coaches was identified from three British National Governing Bodies of sport (NGBs - two individual sports, one team) through discussion with an executive representative (a Point of Contact – PoC) from the coaching or performance management sections of each organization. The subsequently agreed and applied criteria for individual coach inclusion were that:

- Each coach held a high level qualification.
- Each had at least ten years' experience in coaching at the high performance end of the sport.
- Each had coached at least one athlete/team to a high level achievement. This was defined as a senior or age group European/World/Olympic medal for the individual sport and a national final for the team.
- Each was at least a part time professional in coaching.

This resulted in a sample of 19 coaches; 8 from the first individual sport, 4 from the second and 7 from the team sport being identified. Coaches (all male, mean age = 44, S.D. = 4.2) were not approached as participants and were unaware of their involvement; nor were any confidential details recorded about them, as per the requirements of the institutional ethics committee. Rather, data were based on interviews with the coach/performance manager (i.e., PoC) and records kept by them regarding the sample of 19 coaches as part of their monitoring process for the NGB. This approach of asking informed and consenting specialists to comment about the anonymised characteristics of individuals under their charge is a well-accepted methodology (albeit with larger numbers) in preliminary epidemiology (e.g. Westert et

al., 2005). Equally, exposing implicit behaviours (or at least behaviour that wouldn't readily be admitted) without participants being fully aware of the aims of the study is common in investigating prejudice (e.g., Green et al., 2007). In the present investigation, the methodology permitted consideration of characteristics and perceptions which, owing to potentially negative connotations, would have been difficult to access in any other way.

4.2.3 Data Collection

It is important to stress that, until the completion of all data collection, PoCs were unaware of any of the theoretical underpinnings or applied issues being considered. Neither were they asked to select coaches as representative of any particular category. Rather, PoCs reacted to the imperative of the study, which was to select high level coaches on whom they held good records and a personal knowledge. It was the combination of these two factors that facilitated a detailed descriptive conversation, giving an informed perspective of each coach's attitude and approach to professional development opportunities. Specific questions asked related to theoretical concepts described earlier. Stimulus interview questions relating to each coach were:

1) To the best of your knowledge for coach X what were/are the:
    a) Number of non-compulsory CPD days attended last year?
    b) Number of specialists used as part of the support team?
    c) Known mentoring relationships with other coaches?
    d) CPD applications made in the last three years?
    e) Number of European/World/Olympic medallists coached[7]?
        i) Of which coached for over five years
2) In your opinion what is coach X's general attitude and inclination towards innovation in coaching?
3) In your opinion what is coach X's general attitude towards professional development?

[7] Question 1e only related to the two individual sports hence only relating to 12 coaches.

4.3 RESULTS, SPECULATION, LABELING AND MORE RESULTS

4.3.1 Categorization - Vampires and Wolves

It was as the conversations took place, and through subsequent analysis of these qualitative data, that the labels for the two emerging sub-species occurred. For clarity, these terms will be used from now on. The analysis of the verbal data relating to the coaches suggested that they were falling into two categories, with the split apparent in the reported self-schemata, thinking and behaviour about them offered by the PoC. The first category was termed as *Vampires* – these coaches seemed to see themselves as superior and as working in ways so different that they were 'a race apart'. Confident and self-focused, these coaches would quite literally 'suck the life' out of people whose actions were seen as getting in the way. This categorization was informed by comments from one of the individual sport PoCs as exemplified below.

> He's been around a long time, and has seen a lot of change, but never seems to have endorsed any of it and kept himself to himself. Charming to your face.....very critical, almost destructive behind your back.

Or another from the same sport:

> X knows one hell of a lot about XXXXXX and is someone everybody would listen to. He's so negative though; always telling anyone who will listen why we can't win or what such and such is doing wrong. I don't think he listens too much.

The team sport PoC described one coach as someone who:

> …sucks the life out of any initiative...he prevaricates, gives you twenty excuses why he can't stay with the program, and all the time you know he's just doing what he has always done.

By contrast, the *Wolves*, although described equally as driven and uncompromising, were veracious in their search for and assimilation of any idea, technique or person who they felt would provide an edge. Often working in tight knit groups (packs?), membership of which spanned national and even sport divides, wolves often worked collaboratively to develop their practice. Similarly, this categorization was informed by comments from PoCs as exemplified below:

A Team Coach was described as:

> A total pain in the a**e! If something's happening and his team isn't part of it, the phone glows red hot. He simply grinds you down until his guys are getting a piece of the new action.

For one of the individual sport PoCs, the commentary about one of his coaches was slightly more positive:

> I must get an email from X at least once a week....he's read something somewhere and is on to me asking my opinion, where we can get it, etc. I know he does this with some of the other coaches in his region as well.

In many respects, the two categories appeared to say some very similar things. For the PoC participants, however, the coaches' actions were often louder than their words. A PoC from an individual sport summed up this difference succinctly:

> All these guys talk a lot about the necessity to 'never stop learning' and make a lot of noise about CPD budgets and the like. Only some carry this through however....they will all attend what we put on but I know that only some of them go out and look for more. In fact, it's those guys who really get stuck in on CPD days; they are open with their comments while the others just sit and look down their noses....they're really miserable b******s!

As a second stage of analysis, and given the deductive nature of developing the above definition of coach categorization (i.e. wolf or vampire), actual categorization of the coaches was completed by an informed masters student who was otherwise blind to the aims of the study. Equipped with a definition as shown above, she placed each coach in one of the two categories, or in an undifferentiated box when the information supplied was insufficiently clear. Judgments were made against pen portraits of each coach, which were generated on the basis of PoC comments and subsequently confirmed by PoCs (still unaware of the classification) as providing a true representation of the individual described: this latter confirmation offering member checking of the derived descriptive data. This led to 9 coaches being labelled Vampires and 6 Coaches labelled Wolves, the remaining 4 coaches were undifferentiated.

4.3.2 Differentiation - Behavioural Differences

On the basis of type labelling, the median and range results for the six behavioural constructs requested, using the PoC's records as the data source, were grouped against vampires and wolves. The differences are summarized in Table 4.1. The last

two rows describe a difference appropriate for only the individual sports – cell numbers are shown in bold.

Construct	**Vampires** **Median (Range)**	**Wolves** **Median (Range)**
Non-compulsory CPD days attended last year	1 (0 – 3)	4 (2 - 9)
Number of specialists used as part of the support team	2 (0 – 4)	4 (2 – 6)
Known mentoring relationships with other coaches	2 (0 – 7)	5 (3 – 9)
CPD applications made in the last three years	1 (0 – 4)	4 (2 - 7)
Number of European/World/Olympic medallists coached **(6V to 6W)**	2 (1 – 4)	3 (1 – 4)
Of which coached for over five years	1 (0 – 2)	3 (0 – 4)

Table 4.1 Differences in behaviour and outcome between categories

Reflecting on Table 4.1 it becomes obvious, in this sample at least, that behavioural differences between types of coach exist, emanating perhaps from attitudes toward professional development. Furthermore this evidence lends further behavioural qualitative data to our interpretations. As suggested earlier by the PoC, self-presentational issues (what the coaches want people to think of them; Leary & Kowalski, 1990) might obfuscate this but, in the end, some individuals seem less than keen to get involved with, or even hold a positive view of, developmental programs.

Additional probing of the data reveals that the distribution of vampires to wolves may differ from sport to sport. The two individual sports had differing numbers of types of coach, the first with a count of 5 Vampires to 3 Wolves, the second 1 Vampire to 3 Wolves. Results from the two individual sports display a differential finding on the median number mentoring relationships with other coaches, with a Median of 2 for the first sport and a Median of 6 in the second. The willingness to share and engage in mentoring relationships is an important cultural contributory construct for the development and evolution of both the development of others (Collins et al., 1991) and self (Yopp & Guillaume, 1999).

4.4 DISCUSSION

The point of this study is not to suggest that one category of coach is nicer, more popular or even (in absolute terms) more effective than the other. In these respects, the most highly esteemed (in terms of people expressing a desire to learn from him) was a Vampire, some of the Wolves were extremely unpopular with their peers (and, in two cases, their athletes) and two Vampires (as opposed to one Wolf) were the 'winning-est' in terms of individual medallists. All of the sample were (by PoC report) driven, confident (at least overtly) and committed. The point is that, on the basis of these preliminary data, there seem to be some systematic differences between coaches in their receptiveness to development, their openness to innovation, and their willingness to learn from, and perhaps even work with, their peers and other specialists. Whether this is actually due to the processes suggested by Entwistle and Peterson (2004) will require further enquiry but coaches are human so it seems a testable hypothesis to follow through.

Given the inherent weakness of the third party data aligned with the deductive analysis of it, it is useful that there are some corroborating ideas in the literature. Consider, for example, the vampires' tendency to avoid reflection and *just know* what to do! Interestingly in this regard, Schön (1991) proposes that:

> Many practitioners, locked into a view of themselves as technical experts, find nothing in the world of practice to occasion reflection… For them, uncertainty is a threat; its admission is a sign of weakness. Others, more inclined toward and adept at reflection-in-action, nevertheless feel profoundly uneasy because they cannot say what they know how to do, cannot justify its quality or rigor. (p 69)

Taken in conjunction with the findings from chapter 3 there is evidence emerging for the existence of a strong tendency for individuals to not only *not think* unless they have to, but even when they could, they prefer not to; vampirism may be more common than first thought.

4.5 CONCLUSIONS WITH SOME SPECULATION

4.5.1 Individual Characteristics Matter

While it is appealing to think that actions within professional environments will always be professional behaviour as defined in the previous chapter, this study suggests that not only is this not the case, some may even work against a culture of professionalism.

It is understanding why this happens that holds at least one of the keys to developing professional coaches.

In order to unpack the reasons for why some coaches do not wish to think it is worth returning to the lazy system work of Kahneman (2003, 2011) referred to earlier in this and the previous chapter. Kahneman describes how the Type 2 system may be more lazy for some than others. He describes how some people have greater self-control over their Type 1 reactions meaning that they are more cautious about engaging in rapid reactions. In other words, some people seem to be more prepared to think things through than others. This view is somewhat supported by the data of this chapter. Indeed, the view offered earlier of some who may progress to committed dualist as opposed to committed relativist is also supported.

Taking this position therefore, it is of note that other researchers have identified two cognitive dispositions that may offer additional explanation. The first is a *need for cognition* (NC) (Smith & Levin, 1996) which identifies that some people are predisposed to think things through more than others. The second is *need for cognitive structure* (NCS) (Bar-Tal, 2010) where people will try to use structuring processes to achieve certainty. Hypothetically therefore, people with a high NC would fit well with seeking a relativist position, whereas those with a high need for NCS would fit well with seeking a more dualistic position. Clearly neither of these dispositions where measured in this study so no definitive conclusions can be drawn. However, it is safe to suggest that, as identified earlier on, individual coach characteristics do make a contribution to how impactful coach development processes will be – these dispositions do offer a basis to investigate from.

4.5.2 Develop a Strategy and a Culture

There are a number of ways in which these ideas can be further investigated and, if supported, employed to good effect. The next chapter will be specifically focused on how effective coach development environments can be created, however to set up the next chapter two ideas are offered – develop a strategy and create the culture.

While it may be more prevalent in some sports than others, the social pressure to CDM/Type 2 process to facilitate learning and performance must be engendered then fully exploited. In short, some sports will require a definite and deliberate culture change if more general progress in coach development is to be made.

Since organizational and social/culture change takes time, agreeing on long term strategy is obviously important but getting the right people to agree and agreeing the

tangible outcomes (even if they might seem intangible) is more so (Burke, 2011). For example, UK Sport has developed a coaching unit with a specific remit to develop future Olympic coaches using a long-term developmental method (more of this later) and to capture the expertise of current coaches. Furthermore, a number of sports, (e.g., Cricket and Rugby League) have actively engaged in the United Kingdom Coaching Certificate Level 4 programme, which has a remit to develop coaches to a level that equates to a postgraduate level of thinking and professional competence. I know that both Cricket and Rugby League would attest to the positive returns accruing from these programmes, albeit that firmer impact evaluation data are required.

Ultimately, the most tangible outcome will be in the form of athlete success: medals, world placing, league placing, talent pool depth, number of talented athletes making transition against agreed benchmarks. Consequently, linking somewhat intangible arguments of logic with identified best practice *and* tangible outcomes is a crucial part of the strategic change process.

Based on the results of this study both culture and strategy would do well to focus on the development of higher order metacognitive skills that support coaches progression to relativistic thinking and practice. Furthermore, given the inherent complexity of progressing towards relativism, creating opportunities for coaches to be supported by appropriate mentors and/or coach developers is a must. Added to this would be the need to create opportunities for peer support and critique (Stoszkowski & Collins, 2014) within a respectful and trusting environment (van Quaquebeke & Eckloff, 2010). Finally therefore, it seems that other factors, such as social encouragement, cognitive apprenticeship and role modelling (Collins, Brown, & Holum, 1991) may be essential to support progression and keep people on the journey, in a somewhat similar fashion to other areas of development (for example, moral development - Kohlberg, 1976; Rest, Narvaez, Bebeau, & Thoma, 1999).

Applying these approaches to coaching development in a coordinated fashion would meet the needs of emerging wolves. It could even prevent the development of vampires by encouraging and cajoling those finding the relativistic approach to coaching difficult and longing for more dualistic approaches, to stay with the journey. However, it is unrealistic to expect that everyone will accept this approach. It is also unrealistic to expect every coach to even engage with this approach, yet some of these coaches may go on to become high achieving vampires. In fact, there are probably vampires who are already in the system and wield considerable political power. So how can vampires be developed? Two suggestions to deal with this situation are offered.

The first would be to create a climate of sharing best practice. Our data would suggest that vampires are happy to take good ideas (albeit they may not usually acknowledge the source) where the application is obvious and better than their current practice, even if they don't really understand the intricacies of the idea. If all coaches (wolves, vampires and humans) are encouraged/invited/expected to share and explore practice then reputations are put on the line and expectations/impressions consequently formed or reformed. Furthermore, those who respond positively to critical forums benefit by being exposed to conditions likely to encourage deep reflection.

The second suggestion would be to recognise the qualities possessed by vampires and engage them to everyone's benefit. For example, vampires who have recognised skills in dealing with problem athletes could have athletes whose issues align with the problem solving procedures of these coaches assigned to them for specified periods of time.

If this all sounds a little Machiavellian then that probably reflects the political realities I expose here and which have been recognised elsewhere (e.g., Potrac & Jones, 2009). My suggestion is that it is better to be up front and plan for these realities than merely react to them when they exceed some critical level; by which time the goal is damage limitation rather than culture change and development.

Finally, the business literature offers important lessons on the efficacious operation of *culture change from within* (Butcher & Clarke, 2008; Clarke & Meldrum, 1999). The crucial and, for a change, useful employment of politics here is particularly noteworthy. The contention of Butcher and Clarke is that *rational* development is just not enough in today's environment. However logical, face-valid and/or worthy an agenda is, its implementation must be accompanied by a well thought through and consistently executed, parallel political intervention. Buy-in and overt support from senior management is an essential feature of this change process; media driven *selling* of the message so social pressures build towards greater praise for wolf-like behaviour is another useful and important component. When used together as part of a coherent plan, attitudes (or at least overt behaviours) can change quite quickly with very interesting results.

Put simply, if the systems *only* reinforce success then dualist approaches can be seen to work so long as the dualistic coach is charismatic enough to attract enough talented athletes with whom such limited procedures will work. Furthermore, a reputation will be maintained despite the ruined chances of those athletes who didn't fit the procedures. However, if increased success rate through broader and deeper talent pools, leading to developed and sustained success is required, then more considered relative

approaches to coaching will be necessary and rewarded as such, *especially* if success is elusive for a time.

In any case, the potential benefits of socially induced change seem substantial and, once again, further research is indicated into this fruitful line for promoting change. The current UK situation is in stark contrast with the openness apparent in other sports/countries. In Dutch football, for example, an ‘open door’ policy exists between clubs for coaches to attend each other’s training sessions. Senior coaches regularly provide lectures to their peers as part of a national quality circle.

In the next chapter I offer a more comprehensive view on how more efficacious coach development practice could be developed and implemented.

CHAPTER 5 DEVELOPING PROFESSIONAL COACHES REQUIRES PROFESSIONAL COACH DEVELOPMENT

5.1 OVERVIEW

The previous 3 chapters have provided evidence that coaching as a process is most usefully viewed through the lens of PJDM. This was firstly evidenced through a desktop study in Chapter 2, outlining how current coaching research consistently aligns with this view. Chapter 3 used aspects of PJDM to investigate and understand the problem solving and DM behaviour of coaches, Chapter 4 used PJDM as a basis for understanding how individual differences could account for a coach's capacity to learn and develop PJDM skills.

In each of Chapters 2 – 4 however, the need for efficacious professional development practice has been raised. In Chapter 2 I identified how developing nested thinking and avoiding bias and overconfidence in decision making would require a shift in coach development practice. In Chapter 3 it was apparent that coaches were happy using substantive judgement and decision making process unless pressured into more formalistic approaches through uncertainty. Furthermore, two coaches didn't acknowledge that there would be uncertainty. In Chapter 4 it became clear that coach development needed to take much great account of individual differences if it was to encourage required epistemological development. In short, while the PJDM view on coaching seems to be relevant, the suggestion here is that more needs to be done to develop this skill.

Against this background, I argue that the biggest impact that can be had on coaching practice at this moment is to improve formal coach development. Consequently, the goal of this chapter is to offer a view on how coach development agency led education[8] in *formal* (i.e. accredited courses) and *non formal* (i.e. workshops, conferences etc.) settings may be completed more effectively. Furthermore, it identifies how coaches can be educated to make better decisions about seeking out and making more of their own *informal*[9] learning opportunities.

In meeting these goals, this chapter draws on the findings of this thesis thus far and on other relevant research. Through the introduction of an educational model of

[8] e.g., National Governing Bodies, Higher Education, Further Education,

[9] The formal, non formal and informal definitions are broadly accepted summaries of the typical approaches to development used by coaches (Nelson et al., 2006)

constructive alignment, alongside a model of coach development based around five further topics:

- Goal setting,
- Understand the coach,
- Understand curriculum content and design,
- Understand adult learning and assessment,
- Understand the context,

I firstly broadly define what the goals of formal coach education should be, delimited to the development of professional coaches. Further to this definition I go on to identify how applying the PJDM theory to reviewing each of the four remaining topics offers direction for the development and delivery of coach development practice. I conclude the chapter by summarising the characteristics of effective coach development.

5.2 DELIMITING THE SCOPE OF THE CHAPTER: PROFESSIONAL COACHING DEVELOPMENT

One of the major problems in writing about the development of coaches is the sheer breadth of contexts and levels of coaching that exist. Sports Coach UK identify sixteen possible contexts in their 4x4 coach development where there are four stages of coaching proficiency from novice to master, across four potential contexts of children's, participation, performance, development and high performance (Davey, Green, & Guise, 2012). Similarly, in their discussion of coaching development, Schempp and colleagues (Schempp, McCullick, & Grant, 2012; Schempp, McCullick, & Sannen Mason, 2006) identify four stages of development; beginner, competent, proficient and expert.

There is obvious sense in having some level of structure for viewing development and to guide thinking. However, the problem that has subsequently occurred has been that researchers and organisations have tried to view this development as being progressive, if not, linear (Cushion et al., 2010; Davey et al., 2012; Schempp et al., 2006) . This has created structures where, in the UK, coaches must start with award level 1, progress to 2 then to 3 and then, where possible to 4. This seems a strange situation; for example, the equivalent view from a medical standpoint would be to say that the entry to being a general practitioner would be to complete a first aid award. In essence, with the historical basis of so much coaching being in the voluntary sector, efforts have been made (presumably from an inclusivity point of view) to view coaching as being a progression from level 1 to level 4.

Obviously, everyone must start out being a novice, however not everyone has the wish to become a professional. Equally, those wishing to become a professional coach probably want a greater challenge than a weekend level 1 course. In short, there must be differing priorities and therefore demands required for developing the able volunteer versus developing the emerging professional. Attempting to write about the development of both in one chapter is both too ambitious and unnecessary; indeed, I would argue this has been the problem for the work of Schempp and colleagues. Even the extensive literature review work of Cushion et al. (2010) spent insufficient time really unpacking what is required for the development of a professional coach. It is against this premise that this chapter is delimited to examining the development of professional coaches.

5.3 SUMMARISING AND DEFINING THE EXPERT PROFESSIONAL COACH

In his work outlining methods of developing effective educational programmes, Biggs (1996) suggests following a process known as constructive alignment. The constructive alignment model identifies six stages of development, with processes 1- 5 being underpinned by a thorough analysis of relevant external standards – process 6 (see Table 5.1). Far from being a linear process, it is an iterative feed forward and backward process.

1 Programme Outcomes	6 External standards. E.g. Market research, coach needs, relevant coach research, educational and institutional policy etc.
2 Coach capabilities to be developed	
3 Assessment framework	
4 Curriculum and learning activities	
5 Packaging of learning into unit/modules	

Table 5.1. Constructive Alignment Model

As such every decision made about one stage must align with decisions made at other stages. For example, if being able to make decisions in naturalistic settings is identified as a key outcome, this should be mapped to capabilities, a relevant assessment strategy, building on relevant learning and curriculum delivered in meaningful and aligned learning episodes. Biggs identifies that the majority of learning and education problems occur because of a breakdown in alignment between one or more of the six stages. Subsequently, Biggs suggests 1, 2, and 6 are thoroughly engaged in before 3,

4 and 5 are attempted. In essence there is a need to identify what coach is required before working out how to develop one and that this *must* draw on externally referenced research based standards of practice. So if an expert professional coach is required then what does this person *look* like?

Before progressing with an answer to the previous question, a further delimitation is required. Even comparatively small changes in context can reduce a practitioner's capacity to operate in professional and expert manner (Kahneman & Klein, 2009). Given that there are at least four contexts (children, talent, elite, and participation) as identified from Sports Coach UK (Davey et al., 2012), there are clearly a wide variety of coaching contexts that exist. It is therefore beyond the scope of this chapter to closely define professionalism in all of these contexts. There is however, sufficient research to offer an informed summary view of the transferable characteristics of a professional/expert coach across all contexts.

In order to offer an informed, evidence-based view, several authors both within and outside coaching have identified key characteristics that align themselves with professionalism and expertise in coaching. Furthermore, the work completed in this thesis also offers a view. The key summary points from these authors are offered in Table 5.2. Even though Table 5.2 summarises the work of the authors, the fact that the table runs to over three pages means that gaining a clear view on expertise is still difficult to obtain. Consequently, Table 5.3 attempts to draw out the key transferable messages from Table 5.2 to present a summary of decontextualized coaching professionalism and expertise.

Author/Writing Teams	Main conceptual points	Commentary
(Abraham & Collins, 1998, 2011; Abraham et al., 2006)	Coaching is goal led decision making process. To engage in the process a broad, deep and integrated knowledge base is required. Six domains of knowledge identified: Understanding of: **Athlete** (who), **Pedagogy** (how), the **Sport** (what), the **Context**, **Self**, **Process and Practice**. Underpinning knowledge is both declarative (the why knowledge, knowledge of understanding) and procedural (knowledge of what or how to do). Experts have extensive knowledge within these domains and this knowledge is organised and accessible. However, evidence from 2006 paper pointed to experts having quite a disorganised knowledge – magpies not filing cabinets. Finally, the application of knowledge in coaching was seen as being synoptic to answer complex interdisciplinary problems.	While DM was identified as the process of coaching, no obvious connection was made with DM theory. In essence expert DM was presented as an application of extensive knowledge base to solve problems. Therefore most implicitly identifying with CDM more than NDM. However, procedural knowledge is identified as being split in two; broad procedural rules that guide problem solving and specific procedural knowledge that answers specific questions. On reflection, broad procedural rules would equate well with formalistic/substantive rules identified by Yates and Tschirhart (2006). Specific procedural knowledge aligns with intuitive DM
(Nash et al., 2012)	These authors identified 6 essential and 1 possible criteria that they encourage other authors to use to justify that coaches who are participants in studies on coaching expertise are actually expert; **Essential**; Uses large declarative knowledge base in problem solving and DM. Utilises perceptual skills, mental models, sense of typicality routines. Engages in critical reflective practice, has a positive view on lifelong learning. Ability to work independently, capable of creativity and innovation. Acknowledges own strengths and limitations. Manages complex planning process. **Possible**; track record of developing athletes.	It is no surprise that many of the essential criteria appear in other boxes of this table since the paper was drawing on other work to create a unified view. In keeping with the findings on Chapter 4 of this thesis, a track record of developing athletes is offered with some circumspection.
(Côté & Gilbert, 2009)	These authors introduce the term *effectiveness* as a key marker for examining coaching. They suggest a definition of "*The consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in specific coaching contexts." (p. 316).* They offer the view that coaches apply expertise in the identified knowledge domains (i.e. expertise is about knowledge) and that consistent achievement of effectiveness as defined would lead to someone being identified as a expert	This conceptual work is very useful in that there is a clear view offered. However, since the review doesn't actually define coaching (i.e. what is it?) then the effectiveness definition is ultimately flawed. As North (2013) would suggest, the authors offer a definition without identifying an ontological or (much of) an epistemological position. I.e. this thesis offers a view that professional coaching is a PJDM process (ontological view) and should therefore be investigated as such (an epistemological view) – neither the definition nor supporting commentary in the paper really does this. The definition of effectiveness would certainly run contrary to the ideas of multidimensional view of Yates and Tschirhart (2006), offered below. Despite this shortcoming, there are links to other work regarding the application of integrated knowledge bases to answer contextualised interdisciplinary problems.
(Schempp et al., 2012, 2006)	Experts have consistently outstanding performance – this is defined through having more athletes progress to greater success, in a greater variety of environments in less time that less expert coaches (2006 chapter). Experts; • have extensive hierarchically organised knowledge about their sport, athlete and coaching. • have well honed capacity to respond intuitively based on acute perceptual capacities. • plan extensively and hold the skill in high regard. • make use of routines to generate short cuts that often require little mental functioning. • attend to the atypical and investigate why the atypical has occurred. • have a well developed view of what is typical. • will draw on their more extensive knowledge base and spend time understanding the problem before working on a solution. • spend more time in self-monitoring activity, identifying strengths and weaknesses, recognising the boundaries of their skills.	Schempp and colleagues' work shows close synergy with others work in the area of expertise. However, as with Côté & Gilbert, there is no definitive view on what coacing actually is. As such there isn't a theory to tie all of pieces of views on expertise together. However, the breadth of view is more encompassing than the view of Côté & Gilbert.
(Klein, 2008; Phillips, Klein, & Sieck, 2004)	In identifying how experts are able to engage in NDM in general and RPD in particular, Klein and colleagues identify 5 broad transferable concepts of what experts know and what experts can do	While the outcomes of this research do not point to research with coaches in summarising expertise, the clear view on expertise in DM is worthy of inclusion. As was pointed out in

	What experts know **Perceptual skills**; knowledge of where to look and listen, when to look and listen, what to look at and listen for, how often, what it means and why **Mental models**; Interconnected and integrated breadth and depth of knowledge, goals, expectations, actions and cues related to a global topic. I.e., a professional with a more interconnected mental model will establish links between ideas and see a bigger picture that others would see as unrelated and disparate. **Sense of typicality and associations**; the capacity to see (or hear), recognise and interpret patterns, increase expectations of information that should exist and therefore increases capacity to know when there is an anomaly. **Routines;** Rapid processes that short cut what would otherwise be long winded processes they bypass or avoid dead ends and make effective use of resources **Declarative knowledge**; While the previous four aspects of what experts know may actually be quite tacit in nature, experts know more explicitly as well. ***What experts can do*** **Run Mental simulations**; Able to accurately imagine how things might have happened (c.f. diagnose a situation) or in order to predict what will or will not work out in various scenarios (c.f. evaluate a course of action). **Spot anomalies and detect problems**; Due to having a strong sense of the expected the expert is quick to notice the unexpected **Find leverage points**; Having planned and run simulations the expert is able to notice and maximize opportunities to make progress towards goals **Manage uncertainty**; Despite planning and simulations the unexpected happens and creates uncertainty. The expert deals with this as well as possible in the moment through accurate application of relevant RAWFS strategy strand. **Take one's own strengths and limitations into account**; experts are better at self-monitoring their abilities to complete a task	previous chapters, researchers within the NDM paradigm rarely spend any time examining expertise from more analytical DM perspective. Therefore, while there is reference to the need for a strong declarative knowledge base, and the need to monitor one's own strengths and weaknesses, there is little guidance offered on the topic of how (or if) experts engage in more CDM methods.
(Kahneman, 2011)	Kahneman cautions against the concept of expertise and expert judgement. This is particularly where people are required to make long-term predictions. He cites numerous research examples of how experts have been poor at this task in low validity/poorly structured domains such as the social and economic sciences i.e. counselling, psychology, stockbroking, political forecasting. The suggestion of Kahneman was that experts became too confident in the intuitive application of heuristics and biases (i.e. too focused on system 1 rather than system 2) that do not account for all the available evidence. Thus making long term judgements and decisions that were no better than chance decisions. Kahneman highlights that an individual's capacity to consciously engage System 2 to self-control the use and/or monitoring of System 1 can counter the inappropriate use of heuristics and biases.	Kahneman's findings are of concern for coaches and coach developers. The capacity to engage in long term planning is often a key benchmark for coaching expertise (Abraham, Muir, & Morgan, 2010). Indeed Kiely (2011) does caution about being too specific in long term planning in coaching. Researchers in talent do caution against too much emphasis on identification (i.e. prediction) with more emphasis on planning for and monitoring of development (Abbott & Collins, 2004). A key difference for coaching over counselling or economic forecasting is the opportunity for long-term relationships thus *potentially* increasing the validity and structure of the context. The use of metacognitive strategies to control system 1 impulses has implications for both coach education curriculum design and the delivery of that curriculum
(Kahneman & Klein, 2009)	Due to their differing views on expertise the authors wrote this paper to find a position of agreement. The agreed position was that intuitive expertise was possible but only when the expert works in a high validity environment (i.e. where causal information is available for perception) *and* has sufficient opportunity to practice the skill of perceptions and response when rapid feedback is available. They also make the point that "true experts know when they don't know" (p. 524)	The paper offers really useful insight into why there are extremes between experts' practice from highly skilled to over confident. This paper seems to satisfy the uncertainties of both authors about why they agreed and disagreed with excellent guidance to those researching and operating in this domain. However, there is little in the paper to explain the need for knowledge based expertise or an aligned analytic expertise.
(Yates & Tschirhart, 2006)	"A decision is a commitment to a course of action that is intended to yield results that are satisfying for specified individuals" (p. 422). 10 Cardinal rules of decision making: **Need**; does a decision need to be made? **Mode**; how does the decision need to be made, i.e. Analytic, RPD?	Yates and Tschirhart argue that true expertise requires people to be expert in all 10 of the rules. He further suggests that because of this very few people are actually expert since few people will tick all of the boxes. Some of the 10 cardinal rules do seem to be a little tautological in nature, since to satisfy some the rules (i.e. mode) a decision needs to be made. In other words, decision making is a

	Investment; what resources will be required/invested to make the decision? **Options**; what actions are available, capacity for creativity? **Possibilities**; what are the consequences for different options? **Judgement**; cognitive consideration [or not] of pertinent factors affecting the decision to be made. **Value**; what value will people place on various options and will this be different for different people? **Trade offs**; worst case vs best case scenario. **Acceptability**; decisions are not made in a vacuum – they need buy in from others. **Implementation**; can/should the decision taken actually be done and how will it be done?	key factor within decision making. Indeed, it is difficult to see how 9 of the rules are not just context bound factors that will affect the judgement process that precedes the decision being made. That said, it is of benefit to acknowledge there may be more to expertise than perhaps first meets the eye. Furthermore, the focus on judgement has clear conclusions to focus on building the capacity to make judgements through the development and application of knowledge.
(Entwistle & Peterson, 2004; MacNamara, Button, & Collins, 2010; Zimmerman, 2006)	The work from these three authors is used to exemplify the role of self-regulatory and/or psychological characteristics of excellence in the achievement of expertise. Entwistle identifies excellent cognitive learners as being largely self-regulated in their learning through being well organized, being able to manage time and effort, forcing oneself to concentrate, learning for understanding and seeking meaning, checking evidence. MacNamara et al identify 10 core self-regulatory skills; commitment to the domain, vision of what it takes to develop, goal setting, focus and distraction control, belief can excel, quality practice, coping with pressure, realistic performance evaluations, social and communication skills, imagery. Zimmerman splits the skills that he identifies into 3 phases of self-regulation: **Forethought phase**; Task analysis (goal setting, planning), Self-motivation (Outcome expectations, self-efficacy, task value/interest). **Performance phase**; requiring self-control (through imagery time management etc.) and self observation (metacognitive self-monitoring etc.). **Self-reflection phase**; requiring self-judgement (self-evaluation, causal attribution) and Self-Reaction (becoming adaptive or defensive).	There is obviously a strong level of agreement about the types of self-regulatory skills required (fundamental!) to facilitate personal growth towards expertise. It is of note that the supporting evidence points to how people *got there*. One must assume that the same skills are required to *stay there*. This assumption would be supported by the idea from Kahneman about the importance of the linked attribute of self-control since presumably over confidence would lead to a reduction in the application of the self-regulatory skills listed.
(Carr, 1999; Downie, 1990)	These authors offer clear summarised views on what defines a profession: 1. Professions provide an important public service. Service through direct relationships. 2. They involve a theoretically as well as practically grounded expertise. Constantly seeking to maximise effectiveness through reference to formal knowledge. 3. They have a distinct ethical dimension that calls for expression in a code of practice. Professional role comes with rights and responsibilities. The professional promotes the interests of the *client* while self-interest should be secondary. 4. They require organisation and regulation for the purposes of recruitment and discipline. Public trust. 5. Professional practitioners require a high degree of individual autonomy – independence of judgement – for effective practice. 6. Professional practitioners should try to direct policy.	As identified earlier, taking a professional based view as opposed to an expertise based view brings a different and useful perspective. There is clear importance attached to judgement, aligning with Yates and Tschirhart (2006), but there is also a clear view on the need for this judgement to draw on theoretical and practical expertise. The addition of a view on ethics and client focus brings opportunity and challenge for coaching. The opportunity for coaches to push in political circles for a need for athlete focused development. The challenge for coaches will therefore be to recognise and deal with their own selfish self-presentation based intentions. Finally, the emphasis on autonomy within a peer-regulated system reinforces the need for coaches to be given freedom to complete their role, but recognising the need for them to accept and embrace working within a peer group.
This PhD	In addition to the recommendations of the authors above (some of which are already embedded in this thesis) the findings of this PhD add further summary recommendations: Expert/professional coaches engage in nested thinking and planning in a way that connects *classically* (analytically) developed judgements and decision with judgements and decisions made in more *naturalistic* setting. This thinking should draw on pedagogical (in its broadest sense) social and political knowledge streams. Expert/professional coaches will draw on formalistic (theoretical) rules and knowledge bases to answer coaching questions, but this may only occur in when placed in socially pressured situation. Expert/professional coaches take a relativistic view on knowledge and its applicability to coaching. They actively seek knowledge and will work critically with colleagues to improve understanding.	

Table 5.2. A summary of work from key authors and from this thesis examining the nature of coaching expertise specifically, expertise more generally and professionalism.

Principle	Characteristic		Analytical JDM	Rule Based and Intuitive JDM
Professional Knowledge	Mental Models		Integrated mental model that connect theoretical and practical knowledge across spectrum of six knowledge bases;	
	Declarative Knowledge		Broad and deep explicit understanding of relevant theories and their application to their coaching context and self (i.e. who, what, how, context, process & practice, self).	
	Procedural Knowledge		Extensive explicit integrative knowledge of what can be done and how it can be done underpinned by declarative understanding. Awareness of what they do know and do not know.	Well defined explicit formalistic procedural rules to guide in action problem solving. Extensive and accessible set of specific procedural answers to guide intuitive perception and actions.
	Perceptual Skills		Knows what sources of information to search for in order to increase knowledge and awareness.	Where to look and listen, when to look and listen, what to look at and listen for, how often.
	Sense of typicality and associations		Knowledge of and capacity to predict or recognise patterns in environmental information (i.e. opposition tactics, organisational hierarchy, player fatigue etc.).	
	Routines		Knowledge of where short cuts can be taken so that attention and resources can be applied more effectively during analytical opportunities.	Knowledge of short cuts to required actions under time pressure.
	How to think, problem solve and learn efficiently		Knowledge of analytical PJDM methods, knowledge synthesis, synoptic thinking and psychological barriers to this.	Knowledge of based and intuitive PJDM methods and limitations of this approach.
Professional Skills	Plan and re-plan nested goals and operations		Develops (or work with) goals that are global strategic objectives (Macro), tactical medium term markers of progress (Meso) and day to day goals (Micro). Creates linked plans for the achievement of the goals that recognise and account for the inherent uncertainty in longer term predictions.	Makes rule based or intuitive decisions that are aligned with objectives of longer term plan.
	Generates and tests innovative/creative ideas		Drawing on declarative knowledge to create new ideas/views on goals in order to deliberately generate options for discussion, application and testing.	Is able to draw on previous experience and plans to generate alternative strategies through *reflection in practice*.
	Run mental simulations in order to; diagnose, explain, form expectancies		Drawing on mental model options can be thought through with possible outcomes considered and used as a basis for choice and decision.	Serial process of diagnosing how a situation has occurred and/or evaluating the potential success of actions before selection.
	Situational Awareness	Spot anomalies and detect problems	Due to having a strong sense of the expected the expert is quick to notice the unexpected.	
		Find leverage points, opportunities, chances to improvise	Through deep understanding of politics, learning and psychology aligned with understanding of people being worked with, judgements can be made about how to best create leverage opportunities.	Having planned and run simulations the expert is able to notice opportunities (through skilled perception) to make more rapid progress towards goals.
		Assess complex situations	Through being able to draw on knowledge of typicality and associations, patterns within complex situations can be predicted and planned for or spotted and debriefed against deep declarative knowledge.	Through spotting patterns in complex situations formalistic rules are used to summarise and evaluate situations.
		Manage attention	Through application of self-regulatory skills and knowledge of perception pertinent information is attended to and erroneous information and distractions are ignored during JDM.	
	Manage uncertainty		During planning processes uncertainty is embraced, researched against formalistic rules, declarative knowledge and research drawing on analytical perceptual skills to guide the search. Uncertainty encountered in practice can be used as a reflection point when more time is available.	Drawing on available personal and environmental resources judgements are made on allocation of one or more RAWFS method to reduce uncertainty.
	Self-Regulation	Organise and engage in professional development and practice	Actively identifies sources of and critically engages in appropriate formal and non-formal learning and assessment opportunities. Deliberately engages in opportunity to read. Seeks out and engages with a critical peer group to guide informal learning.	Draws on formalistic rules to reflect in practice in order to interpret and critique ideas presented in formal, non formal and informal settings.
		Works within capabilities	Explicitly recognises where the boundaries of expertise lie and actively seeks external input (where possible) to maintain professionalism in JDM. Employs self-control strategies to monitor for inappropriate use of heuristics and biases in JDM.	
		Evaluate performance and work on weaknesses	Draws on relevant sources of data and benchmarks of expert practice to honestly and critically analyse and reflect on self and create self-development goals on an on-going basis.	
		Cope with job and self improvement pressures	Employ metacognitive strategies to maintain focus and work to priorities when under pressure.	
		Stay aware of what others in similar positions are doing	Keeping abreast of innovations and improvements in practice being made elsewhere and tries to find ways of outperforming peers.	

Table 5.3. Summary position of expected professional knowledge and skills within a decontextualized coaching domain

5.4 DEVELOPING THE PROFESSIONAL COACH

The scope of the summary in Table 5.3 really brings to light the demands that formal coach development practice faces. Becoming a professional coach cannot be a quick process, indeed gaining the minimum professional standard in medicine requires 5500 hours of structured development. A similar commitment is therefore presumably needed to become a professional coach. Unfortunately, inspection of the literature examining coaches' experiences of formal coach education (e.g., Abraham et al., 2006; Cushion, Armour, & Nelson, 2009; Piggott, 2012) reveals an obvious irony. While literature identifies how expert coaches are developing their athletes through a systematic and structured process, coaches' own development has generally been un-coordinated, serendipitous and experiential in nature. Furthermore, the role that formal coach education has played within this development is generally small and potentially even irrelevant (Abraham et al., 2006; Cushion et al., 2009; Piggott, 2012). But why would this be the case? A common reason may be found in Druckman and Bjork's (1994) general comments about the teaching/training techniques they reviewed:

> One problem with many of the techniques examined was that they were largely responses to consumer needs – proposed quick fixes from widely recognized problems. If they had been developed in conjunction with knowledge gained from research and evaluated in a systematic manner, the techniques would have benefited from the latest advances in theory and methodology. Such benefits could well have rendered them more effective for improving performance. (p.5)

Reinforcing this view in coaching, Cushion et al. (2009) identified a lack of quality in formal coach education available in the UK. Collins et al. (2014) suggest that the biggest contributing factor in the lack of quality has been the inappropriate and uncritical yet consistent application of a competency based training philosophy to coaching development. The system seems obvious, identify what good people do, train other people to do the same and then assess to see if they can do it. There are, however, four fundamental flaws in the philosophy. Firstly, the focus on doing typically goes no further than looking at behavioural outcomes rather than cognitive processes such as knowledge or decision making. Secondly, the philosophy *may* work for relatively simple and limited behavioural tasks requiring little judgement, since a job can be behaviourally defined in a few statements, e.g. frying chips at a fast food outlet. However, as soon as tasks become more complex, so too does the list of required competencies, showing almost exponential growth. Thirdly, the reason why PJDM is so important is because coaching is a relative role. As contexts change so too does the

need to make a new decision – such relativeness cannot be acknowledged in behavioural competencies. Fourthly, and as a consequence of the first three reasons, learners very quickly feel controlled and unwilling to take risks in such controlling circumstances (Deci & Ryan, 2008), thus reducing intrinsic motivation. All four of these issues are succinctly captured by Thompson (2000);

> Competences are very much in keeping with technical rationality. We also need to keep in tune with the uncertainty and messiness of the 'swampy lowlands'. The standardized nature of competences can encourage a uniform approach and, in so doing, discourage creativity and imagination; What counts as competent practice is predefined. Practitioners, too, must have a say in what constitutes good practice rather than accept it as a given. That is, we need to adopt a critical approach; The competence-based approach recognises the importance of underpinning knowledge but offers little guidance in how it can be used. Therefore working towards achieving competences will not, in itself, facilitate the integration of theory and practice. (p. 121)

5.4.1 Applying PJDM to Coach Development Practice

As identified in Chapter 2, one of the core reasons for introducing PJDM as integrative theory is because it is so parsimonious for all professional practice. That is, whether talking about a coach, a doctor or indeed a coach developer, the theory offers a view on how professionals should practice. Consequently, if one applies the theory to examine the quality of researched approaches to coach development practice the evidence would suggest that judgement has been less than expert or professional. Therefore, if PJDM is required to create educational programmes for the development of professional coaches, what professional knowledge is required and what decision have to be made?

The ideas contained within this thesis suggest that the use of formalistic rules, mental models and declarative knowledge should underpin a PJDM process. The constructive alignment concept already presented in Table 5.1 offers one such formalistic rule, against which the development of formal coach education could be considered. It is of note, therefore, that in creating support documents for UK national governing bodies (NGBs) Abraham et al., (2010) and Lyle, Abraham, Morgan, and Muir (2010) suggested a model to guide the process of creating coach development programmes, shown in Figure 5.1 and referred to in section 5.1.

Drawing on the initial educational work of Shulman (1986) this model of educational practice states that an organisation and/or professional coach developer can make

effective decisions on programme development through consideration of the creations of; goals, needs of the learner (the coach), the subject matter to be covered (i.e. the coach development curriculum), learning, teaching and assessment (i.e. adult learning) and the culture within which they operate. In combination, the constructive alignment model (Table 5.1) and the coach education decision making model (Figure 5.1) offer a basis to both explore the declarative underpinnings of coach development and direct decisions towards creating formal coach development programmes. It is against these ideas that the following sections explore some key research and concepts that can guide the judgements of coach educators in making decisions about the development of formal coach development programmes. Each section will also, where possible, offer some examples of application.

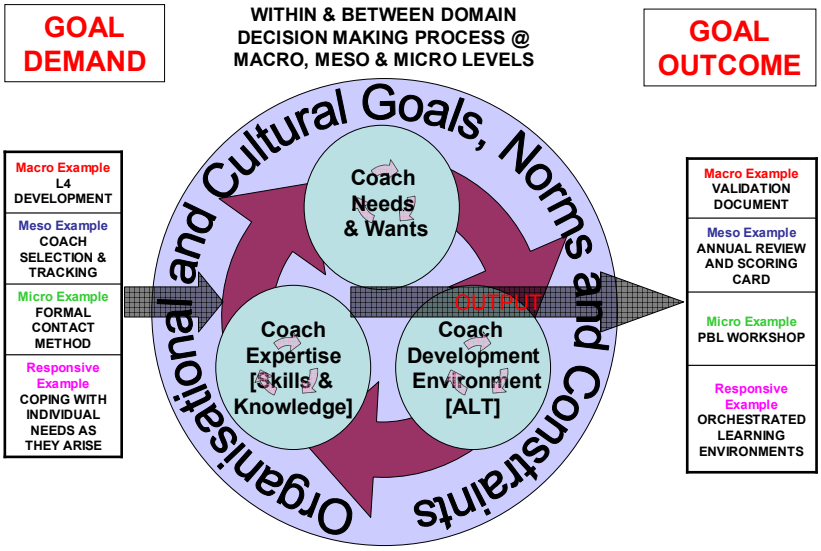

Figure 5.1. A model to guide coach education decision making processes (ALT: Assessment, Learning and Teaching)

5.5 FORMAL COACH EDUCATION GOALS – COMPETENCES OR LEARNING OUTCOMES?

As suggested in Table 5.1, a key objective for educators is to identify the outcomes of a programme of learning. At face value this seems to be at odds with Kahneman's (2011) view about the inherent dangers of long term predictions. Given that most professional education practice lasts several years, is it really possible to predict what professionals should and will be like by the end of a course? The simple answer to this question is *yes* and *no*. Yes, because the obvious outcome is that by the end of a

professional development course the candidate should be more professional. No, because the end of a professional development journey is different for different people based on their experiences, engagement, circumstance, capacity etc.

However, aimless and/or open-ended professional development is unlikely to attract professional recognition, and certainly will not attract certificated recognition. In the absence of both or either of these *kitemarks* public and/or employer recognition is unlikely. It is therefore incumbent on those who create certified professional development courses to develop programme outcomes based on the best available evidence that account for the limitations of having predetermined outcomes. Hopefully it is clear that the point of developing the summary of expertise/professionalism in Table 5.3 was to guide such judgements. As stated however this is a summary without context, further definition would therefore be required to create contextualised outcomes since expertise is context specific. In other words the professional coach developer would need to answer the question, what does a *professional* coach summarised in Table 5.3 look like within a specific context?

5.5.1 Understanding Human Performance: Applied Cognitive Task Analysis (ACTA)

Defining context bound human cognitive performance has been the goal of a broad range of research conducted under the collective banner of Cognitive Task Analysis. CTA is described as having

> the general goal of helping researchers understand how cognition makes it possible for humans to get things done and then turning that understanding into aids – low or high tech – for helping people get things done better. (Crandall, Klein, & Hoffman, 2006, p. 2)

Further to this goal, the same authors identify that there exists "…three primary aspects of CTA... *knowledge elicitation*, *data analysis* and *knowledge representation*." (Crandall et al., 2006, p. 9). In other words access the knowledge of experts, ensure it is interpreted/analysed in a valid and reliable manner and then present it in way that makes sense to those who wish to make use of this knowledge. While this level of agreement exists so too do numerous methodological approaches that have been used to achieve these goals (Hoffman & Woods, 2000). Of these methods one method of creating a view on professional job demands identified in the DM literature is ACTA (Gore & McAndrew, 2009). Gore and McAndrew (2009) identify ACTA as a way of "developing models of the problem space that practitioners face" (p. 219). Further, the method achieves this in way that is less resource heavy and more likely to develop

data that is less problematic to interpret than many of the other methods identified by Hoffman and Woods (2000) due to more deductive nature of the first two stages. In short, it allows an informed, insightful and evidenced based view on a role to be gained in a reasonable time. As such it is well matched to the often low resource constraints of coaching! As a methodological process ACTA follows four steps (explained in more depth in the next chapter):

- Step 1: Production of a task diagram to provide the reviewer with a broad overview of the tasks involved in the role. For example, the components included in Figure 5.1.
- Step 2: The Knowledge Audit. This reviews the expertise required to complete the tasks identified in the task diagram. For example, exploring the task against the ideas included in Table 5.3.
- Step 3: The Simulation Interview or Scenario with highly skilled practitioners (or alternatively observation of practice and debrief). This allows the exploration of hard to acquire ideas or semi tacit knowledge.
- Step 4: Creation of Cognitive Demands Tables. Essentially the output of the three preceding steps delivered in a user recognisable fashion, with relevant follow up explanation.

Well completed cognitive demands tables following the guidelines above represent the meaningful presentation of results to interested other and can therefore a benchmark of practice for a profession. However (and as evidenced in the next chapter), even with a rationalised data collection process, cognitive demands tables do present a lot of data, which if used to create CPD outcomes could lead back to an overly complex competency based system. The alternative strategy is to write outcome statements that reflect the contextualised relativistic demands of the profession. Typically, two approaches have been employed in this situation; the development of professional competences (typical in established professions) or the development of programme learning outcomes (typical in higher education).

Professional competences are different from behavioural competencies in that they are more reflective of the PJDM process and are better defined. The definition of professional competence below, coming from medicine;

> the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served. (Epstein & Hundert, 2002, p. 226)

Learning outcomes are a popular way of defining the outcome demands of higher education. In essence the justification of this idea is obvious, students go to university and learn something so there should be an outcome. Like professional competences, they are written on the basis that there is a view taken on what should have been learned with a focus on *ways of thinking and practising* (MCcune & Hounsell, 2005) emphasising judgement. Within the UK at least, there is a continuing push for the professionalization of coaching to be aligned with postgraduate qualification. In taking this stance, coaching development at this level is aligning itself with the demands of a Postgraduate Diploma (PG Dip). These demands set by the Quality Assurance Agency, albeit not all would have to be met since these are for a full Master's degree[10], again reflect of focus on professionalism:

Students who have demonstrated:

- *a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline, field of study or area of professional practice*
- *a comprehensive understanding of techniques applicable to their own research or advanced scholarship*
- *originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline*
- *conceptual understanding that enables the student:*
    - *to evaluate critically current research and advanced scholarship in the discipline*
    - *to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.*

Typically, holders of the qualification will be able to:

- *deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences*
- *demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level*
- *continue to advance their knowledge and understanding, and to develop new skills to a high level.*

And holders will have:

- *the qualities and transferable skills necessary for employment requiring:*
- *the exercise of initiative and personal responsibility*

[10] A PG Dip in the UK equates to two thirds of a full masters degree. Since the final third is typically aligned with a research project some of the more research practice standards would not necessarily align with a PG Dip.

- *decision-making in complex and unpredictable situations*
- *the independent learning ability required for continuing professional development.*

(QAA, 2008, p. 20-21)

Neither professional competence nor postgraduate learning outcome approaches explicitly acknowledge the role of, nor differing options for, making decisions as defined in this thesis. However, when aligned with a more focused view on PJDM, alongside contextualised cognitive demands, they offer a method creating outcomes for professional development that can reflect PJDM principles.

Organisation	Exemplar Professional Competence (GMC) & Learning Outcome (Leeds Beckett University)	Capabilities/Skills
GMC Overarching Outcomes for Graduates	Apply psychological principles, method and knowledge to medical practice	Explain normal human behaviour at an individual level. Discuss psychological concepts of health, illness and disease. Apply theoretical frameworks of psychology to explain the varied responses of individuals, groups and societies to disease. Explain psychological factors that contribute to illness, the course of the disease and the success of treatment. Discuss psychological aspects of behavioural change and treatment compliance. Discuss adaptation to major life changes, such as bereavement; comparing and contrasting the abnormal adjustments that might occur in these situations. Identify appropriate strategies for managing patients with dependence issues and other demonstrations of self-harm
Leeds Beckett University MSc Sport Coaching	You will be able to make, defend and critique professional judgements in order to critically evaluate developmental needs and wants of the individual participants with whom you work in order to personalise practice	Design and apply methods of analysing and tracking participant development. Set personalised goals and monitor, review and regulate progress toward set goals. Demonstrate a critical awareness and application of physical and/or social sciences relevant to the participant and own role

Table 5.4. Examples of Professional Competences and Learning Outcomes aligned with expected typical capabilities. (Abraham, 2012; GMC, 2009)

In order to bring greater definition to professional competences or learning outcomes , exemplar practical skills or capabilities are typically aligned as per the ideas offered in Table 5.1. These capabilities would have a direct relationship with the findings of any ACTA process. It is important to note however that these are rarely individually checked at an assessment level (although they can be if they are crucial to practice i.e.

inserting a cannula for doctors) since this starts to return to behavioural competence checking. Rather, they act as guides to practice applications and assessment tracking. Table 5.4 displays examples from both the General Medical Council's (GMC) *overarching outcomes for graduates* and the Leeds Beckett University MSc Sport Coaching. The example from Leeds Beckett University does explicitly reference the need for PJDM.

5.6 ACCOUNTING FOR INDIVIDUAL DIFFERENCES IN COACH DEVELOPMENT

Although exemplar competences and outcomes are offered in Table 5.4, the creation of such competences and their development in practitioners would ordinarily require further thought as shown in Figure 5.1. Progressing on from the set goals therefore, consideration should be given to the needs of the individual undertaking any professional development programme.

Evidence presented in Chapters 3 and 4 concluded that individual differences in approach to both DM and professional development require serious consideration in coach education and development design. In Chapter 3 it became apparent that the preference for coaches was to go with pet substantive heuristics when first presented with a coaching problem, with little sign of going beyond heuristic based RPD. However, when pressured/placed in a position of uncertainty, the majority of coaches resorted to viewing the problem through a more formalistic lens, wishing to be more careful and engaging of peers, methods that would reflect a more analytical CDM approach.

In Chapter 4, evidence was presented to suggest that epistemological levels of development, approaches to learning and willingness to engage in peer discussion all could distinguish between those more and less likely to engage in professional development.

In short, there is evidence emerging that accounting for individual differences is critical when making judgements about the creation of educational programmes. In researching for this thesis, it became apparent that motivational and metacognitive theories could explain some of the individual differences already described. Furthermore, two cognitive dispositions have also been offered in the previous chapter (NC and NCS) that could have a bearing on how coaches engage in coach development. These are in addition to (but explanatory of) the factors already identified. While these motivational, metacognitive skills and cognitive dispositions have not been explicitly evidenced in this thesis, their pervasiveness in the literature

make them worthy of consideration. Indeed, if coaching should be athlete centred then realistically, coach education should be coach centred, which can only be achieved through better understanding of the coach. However, how would coach centred education be created?

5.6.1 Motivational Theory: Self-Determination

One consideration of individual differences may be to acknowledge that as soon as standards are set (i.e. competences) so too have *needs* but are they what the coach *wants*? Simplistically, wants are what the coach wishes to get out of a course, needs are what the educator (or another significant-other) thinks the coach should get out of the course. It obviously helps therefore if wants and needs are closely matched. At a more complex level there would also be other agents who have wants and needs such as coach managers that need to be considered – I will come back to this issue later in this chapter.

Theoretically, Deci and Ryan (2008) argue that individuals will have higher intrinsic motivation to engage in an activity if they can gain a sense of relatedness, competence and autonomy from that activity. For example, consider the links between Deci and Ryan's ideas and why so many coaches have apparently developed expertise through their own diligence; also why informal learning is so often cited. Firstly, the coaches have *autonomy* of choice when they decide about what to engage with and when. Secondly, the coaches gain feelings of *competence* by deciding what ideas and knowledge they find useful and can work with while choosing to ignore those they don't (especially as no one is looking over their shoulder to check understanding). Finally, by making these choices they are more likely to gain ideas and knowledge of how to *relate* better to their athletes, other coaches, parents and officials. In essence self-driven learning is by its very nature intrinsically motivating.

Unfortunately, this informal cherry picking approach to self-development inevitably leaves gaps in a coach's repertoire of skills and knowledge since they become knowledge magpies rather than structured filing cabinets (Abraham et al., 2006). Indeed, many coaches can't or won't engage in such a level of self-development either because they don't know how to or they don't want to (i.e. vampires or emerging vampires).

By inference therefore, one of the major issues for organised coach education is that it must work hard to make sure needs and wants become aligned as quickly as possible. Furthermore, offering a level of ownership in the process seems to be important. Both ideas would however be highly unusual in coach development, especially within

competency based systems. Finally, developing awareness in coaches of what professional/expert coaching is, can support a more structured rather than cherry picking approach to informal self-development by coaches.

All too often however, coach education is developed with little reference to the coaches attending the course. Consequently, a coach may simply accept that their wants are irrelevant and buy into the needs offered by a course – they may even enjoy it! However, without any link to the coach's own practice, professional knowledge and skill transfer from education may well be poor. Furthermore, because the coach fails to gain a sense of ownership of any new material delivered they struggle to develop self-monitoring and feedback procedures, relying on the expert coach educator to identify if progress is being made. Deci and Ryan (2000) refer to this situation as developing learned helplessness, i.e. the course and the tutor becomes a crutch of development rather than an instigator of self-development. Remove the course and self-development very quickly slows down.

5.6.2 Self-Regulation: Psychological Characteristics for Developing Excellence (PCDEs) and Deep Learning

While understanding how motivation will affect how a coach approaches a professional development or learning opportunity, it is their metacognitive, self-regulatory skills that will heavily determine what they take from the learning opportunity. The most commonly cited self-regulatory view is the fixed vs. growth mindset concept from Dweck (2012). Developed from work in the late 1980s this concept identifies that someone with a growth mindset believes that talent developable commodity influenced by hard work and learning. Therefore, becoming better at learning will be crucial in this process. Those with a fixed mindset see talent as innate, and that performance in a skill is predetermined by the *amount* of talent that someone has and there are those who have talent and those who don't. As such, understanding a coach's view on their learning and that of others will help in matching development interventions with that coach.

Recently however, greater definition as to the skills that support a positive approach to learning has been offered by MacNamara et al. (2010). As described in Table 5.2 these authors identify ten core psycho-behavioural skills that align with effective personal development; commitment to performance domain, vision of what it takes to develop, goal setting, focus and distraction control, belief can excel, quality practice, coping with pressure, realistic performance evaluations, social and communication skills, imagery. Importantly and in keeping with their development scope, the authors identify how

these skills can be developed, indeed going further saying they deserve explicit development. Again, building a picture of a coach's PCDEs (most usefully with the coach!) can help educators target their curriculum interventions with coaches allowing for coaches to take greater control over their own development.

Finally, Entwistle and Peterson (2004) identify how adults who display a deep as opposed to surface approach to learning are much better placed to make sense of the learning opportunities afforded to them. To illustrate,

> 'those with a deep approach have an intention to; seek meaning, understand ideas, connect new ideas to previous knowledge, seek patterns, check evidence, examine logic and argument critically, monitor and test understanding against practice, and enjoy the intellectual challenge' (paraphrased from p. 415).

In contrast, those with a surface approach struggle to see meaning, focus on memorising rather than understanding, focus on what the minimum required to pass is, and struggle to see connections between parts of the same course. So, again, when taken with the epistemological and learning level ideas presented in Chapter 4, these ideas can help build an understanding of a coach's intentions when they engage in a learning opportunity. Clearly, a coach displaying characteristics consistent with a deep approach to learning is well placed to improve their professionalism. This is especially true if the coach education course meets the coach's expectations. Furthermore, and against all of the self regulation ideas included here, the evidence presented suggests that improving *students* (such as coaches) awareness and knowledge of self regulation can have significant impact on their development.

5.6.3 Cognitive Dispositions

The self regulatory behaviours discussed in the previous section could be classed as malleable, open to change and almost *state* like from a psychological point of view. In contrast, in the previous chapter I identified how cognitive dispositions (which are probably more *trait* like), such as need for cognition (NC) and need for cognitive structure (NCS) may offer some explanation for the emergence of vampires. As was noted, there was no explicit evidence to support this position in this thesis. However, the evidence of these dispositions found in adults in other studies (e.g., Smith & Levin, 1996; Toplak, West, & Stanovich, 2014) makes them worthy of consideration in this chapter, especially given their connection with people's capacity to learn and make decisions. In fact there are a number of other cognitive dispositions identified in the literature that are worthy of exploration under the banner of *individual differences*.

Before discussing NC and NCS however, I revisit the issue of cognitive bias discussed in Chapter 2 and identified as being so potentially harmful in human judgement and decision making by Kahneman (2011). Like NCS and NC, biases are human dispositions that cause us to ignore part of the information available to us while directing attention to other information or cause systematic deviations away from a standard of rationality;

> The 3 main normative standards are the principle of dominance, the principle of invariance, and the sunk-cost principle. The principle of dominance holds that a person should choose the option that is never worse than the others and may provide a better outcome. The principle of invariance holds that same information should be understood and weighed the same regardless of how it is presented. The sunk-cost principle holds that because decisions influence the future, decision makers should weigh future consequences and not previous outcomes or behaviours. (Blumenthal-Barby & Krieger, 2014, p.2)

Clearly, if one of the goals of professionalism/expertise is to engage in rational thought, avoiding biases would be a useful start. Numerous biases have been identified within humans. Blumenthal-Barby and Krieger (2014) cite nineteen examples that have been studies within medical decision making (over 160 are listed on the cognitive biases Wikipedia page!)., Although, Kahneman (2011) points to numerous studies that confirm the presence on biases in humans, Klein, Moon and Hoffman (2006) argue for caution since the majority of studies are laboratory based . They go on to state how the presence or impact of biases is often diminished in more real world setting based studies. Clearly, in the absence of data collected within a coaching context, it is hard to point to which biases are present in coaching and the extent of their influence. However, experience would suggest that at least five are of worthy of mention (despite the inherent irony of my inclusion of *confirmation bias* in forming my argument), with a related example offered.

All biases are Type 1 responses that seemingly everyone is predisposed to. However, all of them can be circumnavigated by the self-controlled application of the Type 2 process. Unfortunately, in the absence of this self-control, or indeed the absence of recognising self-control is even needed, the above biases may well impact on coaching behaviour as displayed in the aligned exemplars. It is of note therefore, that other cognitive dispositions may well have an impact on the self-control that people have.

Cognitive Bias	Explanation
Availability bias (Kahneman, 2011)	Initially a bias investigated through risk examination, this bias is a desire to draw on that knowledge which seems to fit most closely with the risk being viewed at that moment. More broadly it is application of knowledge that is most available in a given moment. For example, the tendency of novice coaches to return to practice methods they engaged in as athletes, despite new knowledge suggesting alternative approaches.
Cognitive conservatism bias (Tetlock, 2005)	Along with the self-serving attributional bias, cognitive conservatism is a reluctance to change one's mind or beliefs even in the face of evidence to do so. It is the avoidance of dissonance. For example, this is strongly supported by the data used to identify vampires in the previous chapter.
Confirmation bias (Bar-Tal, 2010)	The act of seeking out or attending to ideas that not only fit but act to confirm our own ideas while also ignoring those that don't. For example, confirmation bias is one of reasons why informal approaches to self development leads to cherry picking of ideas. Also why people (coaches) ignore ideas deemed too difficult, lacking connection or contradictory of current beliefs.
Base rate bias (Kahneman, 2011)	Ignoring or failing to notice important basic (in a fundamental sense not necessarily an easy to understand sense) information that is crucial in forming objective judgements. For example, a birth base rate would state that elite athletes should be distributed across all months of the year. However, relative age effect data clearly shows that this isn't the case.
Bandwagon bias (Kastanakis & Balabanis, 2012)	A social grouping bias that occurs when a commodity becomes in demand simply because others of similar or slightly advanced status also have that commodity. The commodity could be physical or virtual, i.e. knowledge. Often this is irrespective of the evidential quality of that commodity. For example, the rapid and uncritical acceptance of the Long Term Athlete Development model (Balyi, 2002) by many NGBs in the UK.

Table 5.5. A summary of five known cognitive biases with aligned exemplar applications.

In addition to cognitive biases, three further cognitive dispositions are evident in the literature that seem to be more reflective of how the Type system is deployed and employed. Two of which are those referred to earlier, NC and NCS, the third being Maximisers vs Satisficers. Interestingly, none of the research examined suggested that these dispositions are related, or that they are orthogonal. As such, I offer these ideas on the basis that they are separate dispositions with the capacity to interact:

Disposition	Explanation
Need for Cognition (NC) (Smith & Levin, 1996)	"a natural tendency to engage in and enjoy thought" (p.284). People with high NC are likely to be more analytical, search for information longer and be better problem solvers. The available evidence suggests that High NC can provide the self-control needed to avoid unnecessary use of the Type 1 applications of biases. Further evidence suggests that, irrespective of a person's dispositional NC, encouraging people to engage in more analytic processing can mediate the application of bias (Thomas & Millar, 2012).
Need for Cognitive Structure (NCS) (Bar-Tal, 2010)	**"**Cognitive structuring fulfils many functions in human information processing, such as the selection of information, avoidance of inconsistent information, or specific attendance to relevant information all of which are functional in achieving certainty" (p.96) While all people want to achieve some level of cognitive structure (the alternative being permanent dissonance) the NCS disposition suggests some people have a greater need for cognitive structure than others. This is potentially very useful in explaining why people struggle so much to deal with multiplism and subsequent epistemological stages. Those with a high NCS may well find the inherent uncertainty and complexity that comes with this stage to be overwhelming. It would seem that some people are more willing to engage with complexity and chaos than others. Low NCS Hypothesis suggests that these people will be more vigilant and willing to search for more information. Furthermore, they are more likely to commit cognitive processes (e.g. working memory, metacognitive, retrieval etc.) and time resources to understanding the issue/problem that faces them in an analytical manner.
Maximisers vs. Satisficers (Parker, Bruin, Fischhoff, Corporation, & Pa, 2007)	This disposition has links with the first two, and may even be an interaction between them although this is not suggested in the identified paper. Maximisers are those who keep working on judgement until a solution is arrived at that will maximise the return. Satisficers will select an option that is good enough. At face value this reflects high NC and Low NC. The added view however, is that an overly pervasive need to maximise may be unhealthy as decisions never satisfy thus creating a stressful situation for the maximiser. Maximisers also run the risk of paralysis by analysis. An ability to recognise when to stop and be satisfied with a judgement so a decision can be made may be important for mental health.

Table 5.6. A summary of three cognitive dispositions thought to impact on people's willingness to engage in analytic thinking.

The key point for these dispositions is that they offer an insight as to why people may be more or less likely to engage in biased thinking. Consequently, they also offer a view on why some coaches may be more or less inclined to deal with complexity and progress toward relativism. Indeed, it is potentially the interaction of these three

dispositions and their potential to mediate (or not) the application of bias that is of greatest interest. Obviously, more work needs to be completed in this domain to fully understand its application for coaching practice and development. However, as evidence based concepts, cognitive biases and dispositions do offer a lens through which to monitor the engagement of coaches in coach development programmes. Furthermore, in much the same way as self-regulation skills, they offer a potential source of curriculum to enable coaches to better understand themselves.

5.6.4 Summarising Individual Differences

Taken in combination, the individual factors described in the subsections of 5.6 offer a view on how coach development may be made more coach centred: acknowledging that past experience can impact on someone's willingness to take ownership of their learning and thus, can lead to more emotionally aware coach development. Equally, acknowledging that coaches will come with a need for autonomy, competence and relatedness can drive decisions around creating an appropriate motivational and autonomy supportive development climate (Pelletier, Fortier, Vallerand, Brière, & Bri, 2001).

Furthermore, building a view and/or an expectation of what a coach's approach to learning is and should be through metacognitive and self-regulatory skills can help target curriculum and culture. Recognising that while coaches can be biased in their approaches these can be combatted with a rationally focused approach again can drive judgements about the design of courses that encourage rationally focused discussion and/or assessments.

Finally, recognising (maybe even measuring) that some coaches will want more structure in their world while others will want to think things through more can again support coach developers being more aware of their learners. When placed alongside a recognised associated drop in self-confidence (K. Hoffman & Elwin, 2004) as more relativistic positions are arrived at this recognition can allow for more targeted attempts to support coaches during this time through mentoring. I will return to mentoring later in this chapter.

5.7 CREATING AND DESIGNING CURRICULUM

Returning to Figure 5.1 the next focus falls on identifying the subject matter that should be covered in a professional development course. Drawing on the ideas offered earlier in this chapter about coach expertise, the six knowledge domain work of Abraham & Collins (2011) offers a useful starting point for examining what knowledge creates

coaching expertise and thus, helps one start to make informed decisions about the required curriculum in coach education course. The first three of these six are probably the most obvious;

1. Understanding the Athlete: The bio-psycho-social development and responses to training of athletes.
2. Understanding the Sport: The technical, tactical, psychological, physical and movement demands of the sport.
3. Understanding Teaching & Learning: Concepts of motor and cognitive learning and aligned application to creation of learning environments.

These knowledge domains are obviously and explicitly useful with helping coaches make more professional judgements and decisions about athlete development. The remaining three however are slightly less obvious and have been referred to as hidden curriculum by Snyder (1970) (cited in Tosey, Visser, & Saunders, 2011). These remaining three being;

- Understanding Self: An awareness of the basis of one's own behaviour and practice through the influence of beliefs, dispositions, assumptions, knowledge and self-regulatory processes.
- Understanding the Process and Practice of Coaching: The role and application of professional knowledge and skills in judgement and decision making processes in planning, delivery and reflection tasks
- Understanding the Context: Understanding how and why organisational, cultural goals, and norms interact with and impact on coaching, relationships and decision making.

Having six broad diverse and integrated domains of knowledge reveals just how much knowledge there is that could possibly be contained within a professional coach development course. It is clearly impossible that a coach would be expert in each of the domains (and sub domains described below) – indeed in the ideal situation coaches are part of a team of experts within an athletic development programme. However, coaches should still have sufficient expertise to make informed professional decisions within the context that they work. So what goes in and what gets left out? Much of the answer to this question for coach developers lies within the process of task analysis and development of professional competences identified in section 5.1. The remainder of the answer lies in the definition of being a professional and the way in which professionals should make decisions described in Chapter 3 and Table 5.3. In short, there needs to be declarative knowledge of theories so that analytical thinking can be engaged in. Furthermore, there should be formalistic procedural rules to either

guide the analytical application of declarative knowledge to problem solving or to guide recognition primed diagnostic or evaluative decision.

Table 5.7 offers *some* suggestions for what this might look like in a professional development course created for coaches of young people.

Domain	**Entry Formalistic Procedural View**	**More Detailed Formalistic Procedural View**	**Underpinning declarative 'ology'**
Understand Athlete	Bio-Psycho-Social Model	Youth Participant Development Model PCDEs 5 Cs Model	Psychology Physiology Biomechanics Sociology
Understand Sport	5 Components of Performance	Tactical – Knowledge and Decision Making Technical – deterministic modelling Physical – Strength, Power and Endurance	Psychology Biomechanics Physiology
Understand Learning	Constructive Alignment	Practice Types – Games Sense, Constraints, Random, Blocked Communication Types – Instructions, Questioning, Demonstration Coach Athlete Relationship	Pedagogy Motor control Motor learning
Understand Process	Plan – Do – Review Coach Decision Making model	Nested planning Problem solving Orchestration Decision Making – Analytical, RPD	Psychology Sociology
Understand Self	Emotional Intelligence	Impression Management Heuristics and Biases Self-determination PCDEs Knowing knowledge Own learning preferences	Psychology Pedagogy Sociology Andragogy
Understand Context	Seen and Unseen Policy	Power and Hierarchy Relationships Strategy	Politics Sociology Psychology

Table 5.7. A set potential formalistic procedural and declarative curriculum relevant to coaches of young people aligned to the six knowledge domains.

It is important to note that I am not advocating that any curriculum is necessarily taught under these domains. It is obvious from the underpinning declarative column that there is a good deal of crossover between domains. As such, knowledge rarely sits easily in discreet areas and there is always curriculum content that is relevant in multiple ways, i.e. talking to coaches PCDEs for athletes (understanding your athlete) may easily progress in to looking at PCDEs for coaches (understanding self and understanding process and practice). These domains are offered as a method for beginning conversations about curriculum.

5.7.1 Spiral Curriculum

Table 5.7 offers a view on what can be taught within a coach development curriculum, however it doesn't offer a view on when it should be taught, in which order and with which emphasis. Acknowledging that coaches will go through an extended period of learning can support the development and presentation of curriculum. Constructivist researchers such as Biggs and Tang (2011) talk about how learning is cumulative, that learning is best when it builds on what is already known. Similarly, cognitive researchers such as Hambrick (2003) would suggest that one of the best predictors of what makes someone more knowledgeable than someone else is prior knowledge. In other words both theorists suggest that knowledge and understanding begets knowledge and understanding. Subsequently, two further learning ideas fall out of this theoretical insight. Firstly, learners are unlikely to exhaust all the learning opportunities from a single or series of learning events (i.e. a workshop, reading, peer discussion) at the first attempt. Secondly, that if learning ideas are revisited, then the participant may well be in a better position to take more from the learning opportunity second or even third time around simply because they know more.

The core conclusion from this work is that the coaching curriculum should be revisited on an on-going and planned for basis, but with additional expectations being placed on the learner when the revisiting occurs. This approach has been termed the spiral curriculum by Bruner (1963) who stated that

> The way you get ahead with learning is to translate an idea into those non-rigorous forms that can be understood. Then one can, with their [leaners] aid, become more precise and powerful… This is most of what is meant when we speak of "spiral curriculum". (p.530).

Theoretically, therefore, the suggestion would be to introduce key topics through the delivery of formalistic rules that direct attention in practice. It is against these that deeper and deeper levels of declarative knowledge can then be layered in more *precise and powerful ways*.

5.8 UNDERSTANDING COACH DEVELOPMENT AND LEARNING

Once again returning to Figure 5.1 the next focus would be on adult learning. As evidenced by Cushion et al's (2009) review of coach learning literature, the domain of adult learning is vast with a wide range of theoretical perspectives – certainly more than can covered here. Consequently, and within the speculative constraints of this

chapter a structure is required to direct attention to relevant learning approaches based on the demands of what needs to be learned. Returning to Table 5.2 therefore, two clear and aligned goals are apparent; development methods should support the learning of professional knowledge *and* professional skills. In other words, development methods must improve a coach's capacity to engage in PJDM in the context within which they operate. With such clear goals apparent, a number of recommendations can be offered.

5.8.1 Treat Coach Learners As Professionals

Every educator has at some point come across a learner who is truculent and disengaged from a learning process. Those who work in education will be expected to find ways to try and engage this student since that is seen to be part of their job. However, different expectations come with professional development. Since professionalism is somewhat synonymous with expertise the role of *deliberate practice,* "a set of activities that have been specially designed to improve the current level of performance" (Ericsson et al., 1993, p. 368), will be crucial in the development of professionalism (Ericsson et al., 1993; Phillips et al., 2004). While Ericsson et al's (1993) suggestion that deliberate practice is not inherently enjoyable seems a little overstated, there is little doubt that becoming professional will not always be straight forward (McCarthy & Collins, 2014). Indeed it will be tough, effortful and long-term in nature. In short, it would seem reasonable to suggest that those engaging in professional development should be expected to display motivations consistent with the demands of becoming a professional. Indeed this may even be a selection criteria, or at least a determining factor for completing a course.

Consequently, there shouldn't be a truculent disengaged learner in a development programme[11], unless they are a vampire. Emerging professionals should be expected to come with, at least, partly well developed (and be open to recognising a need to develop their) PCDEs. They are there to learn and engage in deliberate practice (Phillips et al., 2004). This releases the coach developer and development programme from a need to create *entertainer* style engagement tactics. Rather, it increases the expectation and demands on the quality of practice that the coach developer and development programme needs to offer.

[11] This isn't to say that people wont struggle, in fact they probably should because if the don't it probably isn't difficult enough! The point is that it is those with well developed deep learning intentions and PCDEs who will have the resilience to cope with the difficult times.

Returning, therefore, to the previously presented constructivist and cognitive development ideas of Biggs and Tang (2011) and Hambrick (2003) it is important to acknowledge that emerging professionals will come with established knowledge, skills, beliefs, heuristics and biases. It is also important to acknowledge that this is a rich seam that must be tapped into, challenged and built upon. For example, research examining memory identifies that learning is more efficient and effective when new ideas are presented in a way that is meaningful and contextual to the learner (Christina and Bjork, 1991). To make new ideas meaningful and contextual to the coach they should ideally link to the knowledge and beliefs of the coach. This is especially so if the coach's knowledge and beliefs and biases are to be explored and challenged (Abraham and Collins, 1998). As such, situating teaching in, or linking teaching to, the context and/or experiences of the coach, i.e. their process and practice will be crucial in generating meaning. Indeed, meaning is synonymous with curiosity; the motivation behind exploratory and intentional learning behaviour (Klein et al., 2006).

5.8.2 Understanding Learning

Clearly the point of education and/or development is to support learning, but what is learning? At its most biological learning is the creation of neural connections and networks within various parts of the brain. While neuroscience has started to offer biological views on learning, i.e. brain plasticity (Lövdén, Wenger, Mårtensson, Lindenberger, & Bäckman, 2013), more established theories exist that are better for understanding how adult learning can be understood.

5.8.2.1 Explicit Learning: Procedural and Declarative Knowledge

The most widely cited theory of knowledge development was first put forward by Andersons paper "Acquisition of cognitive skill" (Anderson, 1982). This theory is based upon the *If-Then Production* theory. In short, it is a *perception* (if) - *action* (then) theory of learning and performance. Productions interpret knowledge of the perceived *conditions* of a problem to specify what further knowledge should be implemented to perform an *action*.

Briefly, this theory discusses both the development and content of knowledge. The first, *declarative*, stage refers to the accumulation of a propositional network of facts (Anderson, 1982) that are available in any skill domain. These facts represent *declarative knowledge* content, which I contend is best viewed as the *why knowledge* or the *knowledge of understanding*. This declarative knowledge is developed to a procedural stage. The procedural stage refers to the formation of procedural

knowledge, which, I contend, is best viewed as the *doing knowledge* or (possibly) the *implementation of understanding*.

Although I have referred to procedural knowledge as the 'doing knowledge', learning starts by 'doing' using declarative knowledge. Due to the large amounts of *facts* that have to be used to solve even simple problems, high demands are placed on working memory to both memorise/retrieve and then use these facts. For example, the declarative facts of the perceived problem have to be held in memory while a declarative solution is created. This inevitably means that problem solving is both time consuming and prone to mistakes.

To overcome the drawbacks of time consumption and load on working memory learners start to reduce the amount of declarative knowledge needed to solve a problem. This is completed through *Composition* and *Proceduralization* of problems. Composition refers to learning that several micro problems can to be collapsed into one macro problem, i.e. beginning to see whole problems rather than multiple parts. Proceduralization refers to the capability for declarative knowledge to be removed from the conditions of a production, i.e. short cuts are seen through problems thus not having to attend to all the details.

Knowledge in the *procedural* stage is characterised by knowledge that has gone through the stage of knowledge compilation and has become further tuned (Anderson, 1982). This tuning generates either *generalised* broad problem solving procedural knowledge – this would align with the ideas of explicit heuristics or formalistic rules. Alternatively, *discriminatory* specific problem solving procedural knowledge is developed; this would align with explicit automatic responses. For example, the broad rule (or heuristic) for saying the plural of a noun is to say the noun + s, however, in the case of the word 'man' this rule would be wrong and so a more specific rule would be set up so that the plural of man is 'men' (Anderson, 1982).

Due to the comprehensiveness of Anderson's theory (1982) its content has been used to help explain findings relating to the idea of knowledge begetting knowledge idea of Hambrick (2003). For example, "tactical learning", which is evidenced by the ability to recognise components of a problem, (i.e. "this is a bit like…", c.f. the findings in chapter 3), helps more knowledgeable people see patterns (i.e. perception) in similar environments and therefore make more sense of them more quickly. This is one of the reasons why examples or analogies can work so well with learners – but only if they have the past knowledge to recognise the example.

Finally, drawing on this theory an insight is offered as to why people are often less than willing to engage in Type 2 CDM. Essentially CDM requires people to return to the declarative problem solving stage, although for professionals/experts this would be guided by well-honed procedural rules. It takes people back to having to work harder within working memory.

Potentially of greater note, in addition to avoiding mindless application of heuristics and biases (Kahneman, 2011), evidence points to how this type of more declarative, Type 2 CDM thinking is crucial for innovation and transfer (Pennington, Nicolich, & Rahm, 1995). That is, it is our understanding of why things are the way they are that allows us to generate ideas. These are the ideas that can then be experimented with in practice, refined through critical reflections and then experimented with again until an innovation is created in the fashion described by Schön (1991).

5.8.2.2 Structural Developments in Explicit Learning

Within tables 5.2 and 5.3 there are numerous references to the need for mental models. But what are these and how do they develop? Klein et al. (2006) state that:

> A mental model is generally considered a memory representation, with a salient mental-imagery component, depicting states of affairs but linked to or expressed in terms of concepts, principles, and knowledge..... Mental models are representations that explain events, not isolated stimuli. (p. 70)

Unfortunately, despite the obvious complexity of mental models and therefore the assumed linked time frame to be developed, no clear view on how these mental models can be developed is offered. It is of benefit therefore that a clue can be found in the educational work from Biggs and Collis's (1982) Structure of Observed Learning Outcomes (SOLO) taxonomy. In examining children's developmental changes toward gaining an understanding in academic subjects Biggs and Collis identified 5 structural changes:

- Prestructural.
- Unistructural.
- Multistructural.
- Relational.
- Extended Abstract.

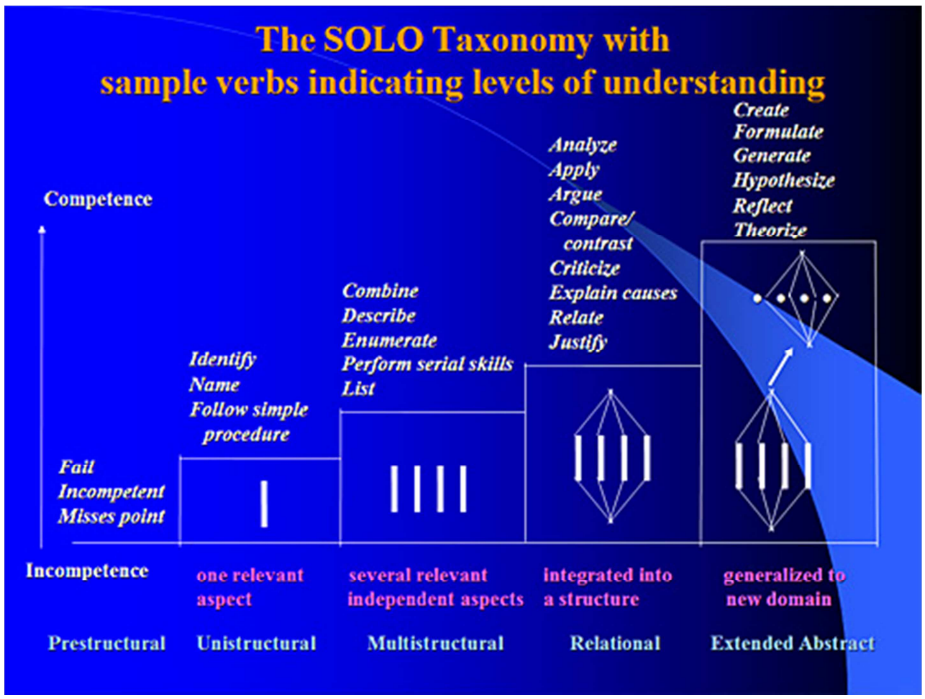

Figure 5.2. Biggs & Collis (1982) SOLO taxonomy. Reproduced with permission of author.

Unpacking Figure 5.2 gives some ideas as to how mental models may develop. The unistructural approach displays how a single topic might be identified (e.g. identifying the self-determination theory, SDT). This then progresses to a multistructural ability to recognise, describe etc. relevant but apparently independent factors (e.g. Competence, Relatedness, Autonomy). Relational learning outcomes would draw on an integrated view of the aspects allowing for a great level of analysis with the ability to apply (e.g. working out how one activity might align with all three elements of SDT). At the extended abstract stage the learner starts to be able to transfer the knowledge from obvious to less obvious situations by being able to hypothesise and generate new ideas (e.g. if SDT can guide the development of a drill can it guide the development of a programme?)

Based on this description of the theory, once people reach the extended abstract stage it would seem fair to suggest that a model of understanding is taking shape. However, where this falls short of the mental model described by (Klein et al., 2006) is that the description offered only relates to one concept. Given the six domains of knowledge described earlier there are clearly far more concepts than SDT that could guide a coach's perceptions and actions. However, taking the SOLO taxonomy onto a more relative position, it is possible to hypothesize that a capacity for extended abstract on one concept could then connect to another in the same domain (e.g. SDT and PCDEs). Furthermore, that this connection may then connect with concepts in another domain

(e.g. communication methods and practice design) to create an understanding of coach athlete relationships, and so on. Through this process it is possible to see that an extensive mental model could emerge. It also makes it clear why professional expertise would take a long time to achieve *and* why tactical learning, the development of heuristics and RPD become important skills to develop within a mental model. It is against this description that Figure 5.1 would be described as an explicit mental model for coach development, so long as one assumes that this accounts for the required declarative and procedural knowledge with aligned perceptual skills, associations, routines and metacognition.

5.8.2.3 Memory

The previous sections have implications for what we store in memory and how we store it. It makes sense, therefore, to examine the role of memory in learning. There is a vast amount of research that examines the peculiarities of memory and how to make best use of it. However, I have chosen to focus on the excellent conceptually clear work of Robert Bjork and colleagues;(Bjork & Bjork, 2011; Bjork & Bjork, 1992; Bjork, 1993; Christina & Bjork, 1991; Schmidt & Bjork, 1992). Bjork has been particularly interested in the way that long term memory works, particularly how we get knowledge in there and how we get knowledge back out again, as he would term it; storage and retrieval. Thanks to the clarity that Bjork brings the recommendations are clear.

To get knowledge into memory Bjork identifies the need to rehearse with knowledge, in other words, to think. This is in keeping with the recommendations of Entwistle and Peterson (2004) that, beyond gaining some confidence about *knowing something*, rote learning should generally be avoided since there is very little knowledge use occurring. I have already identified the importance of *meaning* to learners, thinking can bring much of this meaning. Thinking increases cognitive engagement and therefore increases the number of times synaptic firing will occur in the brain. Indeed, Bjork (1993) recommends the introduction of difficulty to encourage problem solving and cognitive engagement. There are clear links here with the idea of problem based learning that has currency within coaching and NDM research (Jones & Turner, 2006; Phillips et al., 2004). The concept of introducing difficulty would also fit with Biggs' view on expanding the number of concepts that can be linked in problem solving. It is through these processes that Bjork argues stronger long-term memories are made.

In addition to developing storage, Bjork makes the point that one of the key issues in learning and performance is the capacity to retrieve important information from long-term memory. He points out the, on the surface, apparent irony that in order to retrieve something we first have to forget it! In essence however, we are not forgetting

something. The act of retrieval is accessing something from long-term memory for use in working memory. Bjork & Bjork (1992) make two important points about retrieval. Firstly that while storage strength doesn't seem to diminish over time retrieval strength does – this would tie in with why the availability bias referred to earlier will occur over time. As such if something is truly learned it is not forgotten, but we can lose the capacity to retrieve it. Secondly, the act of forgetting is recognising that we no longer have something in our working memory and are also struggling to retrieve it from long-term memory. As such to retrieve something we have to lose (forget) it from working memory in order therefore to retrieve it. Usefully therefore, the act of retrieving knowledge not only increases the capacity to retrieve that knowledge, it also reinforces the saliency of its storage. In short, the act of retrieval seems to be an excellent learning strategy, indeed Bjork (1993) points to experiments showing that distributing learning and assessment events of over a longer period of time increases both recall and performance when compared to the same number of learning and assessment events over a shorter period.

5.8.2.4 Recognising Implicit learning and Tacit Knowledge

Alongside considering the development of explicit knowledge, the role of tacit knowledge development must be considered. Thus far, I have referred to coaching as an explicit thought-through or intuitive process that should be learned in an explicit manner. However, there is little doubt that much of human behaviour is directed by tacit knowledge acquired through implicit learning. Implicit learning "is the acquisition of (tacit) knowledge that takes place largely independently of conscious attempts to learn and largely in the absence of explicit knowledge about what was acquired" (Reber, 1993, p. 5). Simply by operating and immersing ourselves in experiential settings we expose ourselves to multiple perceptual opportunities, expectations and norms that guide and add to our learning without us knowing it. For example, the 'in my experience' quotes from several of the coaches in Chapter 3 would reflect response that were in part informed by tacit knowledge. Indeed the initial substantive approach in itself was largely without explicit thought. It was only when uncertainty was introduced that more explicit and thoughtful approaches were taken.

The outcome of implicit learning – tacit knowledge, has been identified as being a significant factor in expert performance, especially in dynamic situations (Kerr, 1995; Klein, 2011; Sternberg, Wagner, & Okagaki, 1993). Given that it is tacit means that it is a Type 1 knowledge source. As such, tacit knowledge underpins both intuitive reactions and heuristic guided, RPD. Because tacit knowledge is *unknown* to people there is some suggestion that tacit intuitive decision making can be unpredictable and

should therefore be avoided where predictability is required. The typical response to override the danger of unpredictability has been to put *systems in place* that need to be explicitly followed (Klein, 2011). However, Klein (2011) cautions that overruling tacit intuition could create worse results than allowing its continued application. He suggests that the human intuition is designed to spot anomalies, often where procedures can't. For example, Kahneman and Klein (2009) cite a study by Crandall and Getchell-Reiter (1993) who identified how expert nurses in a neo natal care unit were detecting serious health problems before more standard procedures such as blood tests were returned. Indeed, this learning also develops many of our tacit assumptions and deep-seated beliefs that we are, consequently, not particularly aware of (Strean et al., 1997).

While tacit knowledge does seem to be crucial to everyday practice, often so too is learning about it. Accordingly, as pointed out by Strean et al. (1997) and Kahneman and Klein (2009), it is not until we become explicitly aware of these tacit assumptions and practices that we become truly critically reflective and, consequently, more able to think through and influence our explicit decisions. In short, while tacit knowledge is unavoidable in any setting, not least coaching, it is those coaches who gain an explicit awareness of, and critically reflect on, this tacit knowledge who are best able to make the most use of it – declarative knowledge is still important.

5.8.2.5 Implicit and Explicit Expectations – Learning and Work Cultures

It is clearly important to acknowledge implicit and explicit knowledge in professional development and practice. However of equal importance is the need to acknowledge the role of implicit and explicit expectations of the environment within which this knowledge is employed and developed. For example, implicit rules are often referred to in work examining power hierarchies and politics in coaching and their impact on both coach and athlete behaviour (Potrac & Jones, 2009). More explicitly, Fink & Siedentop (1989) describe how experienced teachers deliberately establish managerial and instructional routines with new pupils in their first few classes. They would then reinforce these behaviourally, positively and negatively. The outcome of this method was the development of appropriate behaviour and smooth operation of class activities.

In both implicit and explicit cases, the expectancies created set the motivational climate of the environment (Weigand et al., 2001) thus impacting on behaviour both explicitly and implicitly. In short, and as described in Chapter 4, the culture of an environment (educational or work) can have a large (indeed, potentially massive) impact on the learning behaviours displayed by coaches. Cultures where discussion and questioning are perceived (implicitly or explicitly) as interfering and cause for suspicion will have very different impacts on learning and development compared to those where a lack of

these behaviours is seen as shying away from the challenge. Returning to the ideas presented in Chapter 4, therefore, I would argue that learning cultures are better developed through explicit explanation of expectations. This is especially the case when coaches are placing themselves in a position of vulnerability (i.e. acknowledging that they could know more and are happy for others to assess that) and building trust (expanded on further in section 5.8.3) is therefore crucial. However, these explicit expectations must reflect the *excellent* learning and performance environment required to achieve high-level outcomes.

5.8.2.6 Social Views of Learning

As implied in the previous two sections, social environments play a big role in learning. Typically explained through sociological and/or social psychological theory, social learning has a large impact on the development of coaches (Cushion et al., 2009). Typical theories are; social constructivism, situated learning and social learning theory. However, the inherent problem with the application of these theories in coaching has been that they have rarely had a focus on the development of a professional practitioner. Where they have been applied in these environments the critical features of what is required for a professional are poorly defined. As stated by Entwistle and Smith (2002):

> In social constructivism, there seems to be an important gap in the logic, noted by Katz (2000). He asks how the subjective understanding constructed by the 'knower' is supposed to be linked to accepted knowledge, to allow what counts as 'good work' to be recognised. We need a theory which is directly focused on education and yet broad enough to encompass both individual and contextual perspectives in addressing the activities of both students and teacher. It also has to provide the link between individual knowledge and the accepted norms and standards of educational achievement. (p. 324)

This is not to downplay the role of social environments; however, numerous studies of coaches and other professions exist in which participants extol the value and importance of working with peers and athletes for personal development. Indeed this was a key message of the development of wolves in Chapter 4. However, the point for this chapter, and as eloquently indicated by Entwistle, is does personal development necessarily always equate with professional development? For example, the current trend to create coaching communities of practice (CCOP) has been seen as a way of engaging coaches in more engaging social learning opportunities with other coaches. However, application of this concept has been cautioned against (Occhino, Mallett, & Rynne, 2013; Stoszkowski & Collins, 2014) on the basis that there is typically a lack of

criticality and trust in these environments that is crucial for professional learning. For example Stoszkowski and Collins (2014) state;

> we would also contend that there is a 'clear and present' danger that a CoP may similarly serve as a mechanism to regurgitate and reinforce the values of the social milieu, unless the necessary focused criticality alluded to earlier plays a central role. (p. 779)

They go on to state;

> As an example, coaches should seek out and experience perspectives which disagree or cause dissonance with their current opinions and habits. Unfortunately, human nature tends us towards the exact opposite! (p. 780).

Both comments by Stoszkowski and Collins (2014) show clear links with previous sections on bias, implicit learning and expectations.

Occhino et al. (2013) identify how high performance football coaches (HPFC) did not form CCOPs because of wariness of being able to trust other coaches in the same area – even within their own coaching team. Instead these authors identified how HPFCs maintained a group of confidantes who they were happy to engage with and seek advice from. The problem with this approach is that it can reinforce opinions through bias (e.g., confirmation bias), doesn't actively seek opinions that create dissonance and serves to maintain boundaries of rationality (Kahneman, 2003). In short Occhino et al. (2013) identify how agendas which are seen to conflict with coaches (i.e. selling state secrets) means that CCOPs are unlikely to develop.

There is undoubtedly great opportunity in creating shared learning environments but not unless there is a shared agenda and with no conflicting agendas. It would seem therefore that cross sport CCOPs might be a way forward. However, NGBs in the UK will struggle with this given the current wish to have sport specific formal coach development opportunities. This is in contrast to the German Trainerakademie Diploma that is cross sport and includes an explicit need for coaches to spend time with a coach in another sport (Nordmann & Sandner, 2009).

5.8.3 Trust and Respect in Learning

Despite the prevalence of both trust and respect in coaching and sport literature (e.g. Jowett & Cramer, 2009; Occhino et al., 2013; Potrac, Jones, & Armour, 2002; Ravizza, 1988) I cannot find a single explicit reference to the role of trust and respect in formal coach development. As such, this seems to serve as an avenue for future research.

However, given it is so prevalent it is worthy of some consideration. How are trust and respect engendered and developed?

Langdon (2007) identified five components that create conditions for respect; social power, social rules, caring, equality, personal attributes. Social power and social rules reflect the socially based construct that those in power have a level of respect-due to them – relevant in educator-coach scenarios maybe but not really in coach-coach. This mode of respect may well be maintained by certain members within a group irrespective of subsequent circumstances, but for others this respect – if it ever existed in the first place – may well subside if key criteria are not met (e.g. the degree to which identified values/targets are met/achieved, etc.).

It is, therefore, the three other components of Langdon's (2007) work – personal attributes, caring, and equality – that are most applicable to coach education. Caring is probably the most obvious of the these, although different interpretations will exist between different people, i.e. caring about helping someone be a better coach, caring about helping someone be a better person etc. Equality is a difficult condition to meet within formal coach education when the educator, with power over the coach (e.g. the power to award), will rarely be seen as equal by the coach. However, this distance can be reduced by the educator through focusing on assessment for learning rather than of learning. Equality can also be achieved by educators through modelling the approach required by the student; encouraging critical peer engagement (while maintaining the quality required as Entwistle describes), being open to challenge themselves and honest in acknowledging the boundaries of their expertise.

The *personal attributes* that came through most strongly within Langdon's research were trustworthiness and hard working while a third, knowledgeable, is a predominant issue in the work of Potrac et al. (2002). Obviously, being knowledgeable is crucial in professional development in order to gain credibility, while hardworking reflects the need to model attributes required of the coach. However, as stated earlier, trustworthiness offers the most to gain or lose for educators. Dirks (2000) states that trust is "an expectation or belief that one can rely on another person's actions or words and/or that the person has good intentions towards oneself" (p. 1004), also that trust is most meaningful at times of vulnerability. Integral to the stability of trust expectations is a consistency in the words and actions of those who wish to be trusted. If others (e.g. peer coaches, educators) are perceived to be inappropriately unpredictable in their behaviours this will lead to a weakening of trust (Becker, 2009).

Returning to the work of Occhino et al. (2013), engaging coaches in a CCOP or other peer based groups will require these coaches to acknowledge the potential costs and

benefits of such approaches. Shared goals, with either well defined limits of what will and will not be shared, or no conflicting goals between coaches so everyone knows where they stand will be important in creating an environment where trust can develop. Furthermore, that belonging to the group will be dependent on respectful and trustworthy criticality, that is, in the spirit of professionalism it is expected that challenge will occur in the manner highlighted by the basketball coach in Chapter 4.

Finally, within formal education, where coaches are deliberately placing themselves in a position of social vulnerability it is crucial that coaches feel that the educators have good intentions towards them. Perhaps too often this has not been the case with educators seeing themselves more as the gatekeepers to be second-guessed rather than gate openers to be questioned for clarity.

5.8.4 The Process Linking Delivery with Learning

If coach development has a goal of improving practice then there must ultimately be a positive transfer from one to other. Belling, James, & Ladkin (2004) identified three broad influences on the successfulness of transfer of learning from training to practice; characteristics of the individual learner, aspects of their workplace and facets of the learning experience itself. I have already identified key characteristics of individual learner's ability and willingness to engage in educational settings in a previous section, but what can coach education do about enabling workplace and educational environments that encourage the transfer of knowledge and ideas in to practice?

While it could be argued that coach education only has limited control over workplace practice it is obvious that professional development programmes cannot ignore work place learning. Decontextualized learning that ignores workplace learning and its demands becomes bounded by this narrowness, potentially resulting in the creation of 'mini me' versions of the educators, with little capacity for contextual adaptation. Coach development practice must therefore do all it can to draw work place practice into development design and delivery.

In reality, coach development practice needs to make the most of all relevant opportunities to develop the coach including work based learning but what are these opportunities? Examination of recent work exploring formal, non formal and informal settings points to eight opportunities within or against which coaches could learn; classroom based delivery, formative tasks and assessments, summative assessments, work based learning, mentoring/coaching, working with peers (including social media), reading, distance/online learning. Furthermore, the structure of these approaches can also impact on the learning opportunities offered. It is incumbent on formal coach

development to exploit these opportunities as much as possible to support the progress of coaches towards becoming more professional. Table 5.7 presents a summary of key points taken from literature about each of these approaches.

Learning Activity	Overview	Professional Knowledge		Professional Skills	
		Analytical JDM	**Rule Based or Intuitive JDM**	**Analytical JDM**	**Rule Based or Intuitive JDM**
Classroom didactic delivery	Druckman and Bjork (1994) suggest there may be some fundamental principles of practice that may be better developed in more controlled settings such as classrooms where there is more of a didactic interaction with an educator. Given the limited capacity of memory it may be easier to develop abstract ideas offered by theory in closed settings prior to actual use in practice where there is much more to remember. The focus should be to work on key procedural themes around which deeper declarative knowledge is presented. Drawing/challenging on the coach's current knowledge (or exposing their tacit knowledge) should allow for connections with and build on current knowledge. In the absence of obvious task engagement, didactic delivery does rely on cognitive engagement of the coach.	Can offer big picture structures and point to important declarative understanding within the time of delivery. Can draw out currently known ideas/understanding and challenge or support the development of these. Also, can support the deliberate and systematic creation of mental models through highlighting links between concepts and the underpinning declarative knowledge.	Can focus on or reinforce the key theoretical rules that can guide RPD. Also how concepts link with each other to encourage mental model structural development.	Encourage the connection of knowledge delivered with planning for and reflective on all professional skills.	Delivery can encourage coaches to reflect on perceptual cues and rules/heuristics used during practice.
Formative tasks (assess)	In the absence of direct teaching, tasks can form the basis of directed practice. The formative nature removes the *grading element* and so can promote greater student ownership. Constructively aligned formative assessment should generally; have relationship with expected learning outcomes and coach goals, promote personal autonomy and self-regulatory behaviour, align with learner capabilities, promote risk taking, draw on formalistic rules and declarative knowledge, ask coaches to justify approaches, provide opportunity for accurate feedback (from self and/or peers and/or educator) (Clark, 2012). There is a clear connection with Problem Based Learning (PBL) (Jones & Turner, 2006). A key benchmark is that the task offers the coach an opportunity to identify if they are *becoming better*.	Focus on coach making sense of key theoretical ideas against own coaching practice and current knowledge and approaches. Encourage the consideration of connections within and between knowledge domains, especially through the concept of nested thinking. Critically examine own tacit knowledge. Creation of explicit mental models. Deliberately spaced tasks can encourage both thinking and retrieval.	Focus can be on identifying and reinforcing key theoretical formalistic rules, practice routines, sense of typicality, within and between domains.	PBL and/or case study tasks to focus on all professional skill development, i.e. creating, presenting or reviewing plans, reviewing. The more closely aligned with work place the better to increase meaningfulness. Peer feedback (see below) can increase motivation,	Most useful when tasks require actual engagement in realistic RPD settings. Clear, unambiguous feedback fairly immediate is said to be preferable over more thoughtful methods (i.e. question and answer) due to time and role of Type 1 brain (see mentoring section) (Phillips et al., 2004). In the absence of opportunity for real

Learning	Overview	Professional Knowledge		Professional Skills	
				confidence and offer critical insight.	practice (i.e. time constraints, cost etc. Phillips again suggest the use of case studies or PBL
Summative assessment	Realistically all that should change from formative assessment to summative assessment is the attachment of external grading aligned with passing or failing all or part of an award. The addition of external evaluation can increase motivation and the likelihood of engaging the Type 2 brain, however it can also increase the level of control felt by coaches – leading to reduced autonomy. Returning to the issue of trust, if a coach considers an assessment to be more than just a quality assurance procedure (i.e. an assessment *of* learning that passes or fails) and it is in fact an opportunity to get feedback on progress and offer ways forward they are more likely to engage with it. A perception of assessment of learning by students has been shown to lead to more strategic surface based approaches to learning whereas a perception that assessment is *for* learning leads to greater ownership and deeper approaches to learning (Coffield, Moseley, Hall, & Ecclestone, 2004; Entwistle & Entwistle, 2003). Based on the information included here and the previous formative task section, careful thought is required regarding the method of assessment. However, recognising what is being assessed (i.e. contextualised professional knowledge or professional skills) should lead to an alignment between assessment method and knowledge or skill being assessed.	Written assessments are generally frowned upon within coaching however, the following quote from blogger John Sonmez offers a piquant compelling case for written assessment in the development and assessment of knowledge and mental models: "When we learn something, most of us learn it in bits and pieces. Typically, if you read a book, you'll find the material in that book organised in a sensible way. The same goes for others mediums like video or online courses. But, unfortunately, the material doesn't go into your head in the same way. What happens instead is that you absorb information in jumbled bits and pieces. You learn something, but don't completely "get it" until you learn something else later on. The earlier topic becomes clearer, but the way that data is structured in your mind is not very well organized–regardless of how organized the source of that	See above	See above	See above.

Learning	Overview	Professional Knowledge		Professional Skills	
		information was. Even now, as I write this blog post, I am struggling with taking the jumbled mess of information I have in my head about how teaching helps you learn and figuring out how to present it in an organized way. I know what I want to say, but I don't yet know how to say it. Only the process of putting my thoughts on paper will force me to reorganize them; to sort them out and make sense of them." (Sonmez, 2014)			
Work based learning	Fundamentally, the vast majority of learning hours that coaches will engage in will occur in working hours. Ideally, therefore, work based learning would reflect the needs of formative and summative based tasks and vice versa. However, this may not always be possible because of the constraints of the role, e.g. alignment of planning task with stage of season, mistrust of coach engaging in higher learning so barriers deliberately put in the way of praxis attempts. Phillips et al. (2004) identify four ways that experts learn from their experience: engaging in deliberate practice, compiling extensive experience banks, obtaining feedback that is accurate, diagnostic and timely, enriching experiences by reviewing prior to derive insights and lessons from mistakes (p. 306). It is fundamentally important therefore that coaches understand what it means to be a professional coach so that they (with tutor or mentor support) can deliberately practice and make sense of the feedback available to them.	See summative and formative tasks/assessment	See summative and formative tasks/assessment	See summative and formative tasks/assessment	See summative and formative tasks/assessment
		Realistically, work based learning offers the opportunity to improve on all aspects of the professional knowledge and skills identified in Table 5.3 through deliberate practice.			
Mentoring or Coaching	Rather than talking about mentors Collins, Brown, & Holum (1991) use the analogy of master and apprentice. While this	There are clear links here to the issues explored in the previous	The mentor can share	The mentor can reinforce the need to	The mentor can provide accurate

Learning	Overview	Professional Knowledge		Professional Skills	
	split is probably too large (even irrelevant for some mentor-coach relationships) the analogy of a practitioner (i.e. not a student) going through a cognitive apprenticeship is useful. These authors suggest the master (mentor) can: *model* the skill; *coach* through observation, feedback and prompting; *scaffold* through structuring tasks; prompting the learner to *articulate* their thoughts through a task; supporting the learner to notice and *reflect* on experience; helping the learner to *explore and challenge* current practice, future problems and potential solutions. As with online delivery discussed below, the issue of trust as described earlier between mentor and mentee will be a key determining factor. As discussed by Phillips et al. (2004) the cost of this form of provision can be prohibitive due to its time intensiveness.	chapter discussing the issue of supporting learner through the transition from multiplism through to relativism. Especially at times of low confidence. Articulation tasks and challenge seem to be particularly relevant here.	short cuts and associations etc. from their own experience	keep formalistic rules refreshed/retrieved alongside relevant declarative knowledge. Also to engage in CDM practice when RPD seems like the easier option	and concise in practice feedback. They can also prompt the retrieval of relevant formalistic procedural rules at moments of pressure.
Working with peers including Social media	As suggested in the section on social learning, the role of peers or friends can have a large impact on learning. Ideally peers can operate in much the same way as mentors while potentially reducing resource need. The issue appears to be avoiding the recycling of folk knowledge and the deliberate engagement of formalistic knowledge through praxis. The quote from a basketball coach in the previous chapter regarding defending theories is an excellent example. Again, trust seems to be a major issue in creating a critical peers environment. Based on personal experience, social media platforms seem to offer an excellent opportunity for sharing and discussing topics. However, maintaining criticality and quality remains a key objective. Engagement of peers in summative assessment (i.e. other learners grading work) has shown mixed results, although once trust in peers is established both learner and peer gain benefit from the approach (Orsmond, 2011)	See mentoring	See mentoring	See mentoring	See mentoring
Reading	There is an apparent lack of research examining why reading is important. As such it is not about whether reading is important rather the quality and content of writing and the	Assuming quality reading is selected, reading offers repeated opportunity to access procedural and declarative	Case studies, biographies may offer	As with didactic delivery, coaches would need to make	Reading may prompt thoughts about perceptual

Learning	Overview	Professional Knowledge		Professional Skills	
	quality of reading. The quality and content is of great importance since this maintains the standards of a profession. For example Collins and Bailey (2012) question the uncritical acceptance of ideas that lack a theory or evidence basis being drawn into talent development. Similar concerns are raised by Dekker, Lee, Howard-Jones, & Jolles (2012) relating to the acceptance of neuromyths in education, e.g. learning styles. The quality of engagement with reading also seems to be important. Entwistle's view on Deep and Surface approaches to learning very much applies to reading. Several authors have highlighted the issue of creating coach friendly literature (e.g. Reid & Harvey, 2014). What makes a piece of reading friendly is open to question and probably reflects the learning that is required from the reading. Schempp, Jones, & McCullick (2007) make the point that coaches often read outside their domain to get alternative views. This would sit well with Kahneman's (2003) view that we should broaden our bounded rationality.	knowledge. Books and book chapters may be better suited for acquiring broad overviews and formalistic rules. Journal articles may be better for getting more in depth declarative understanding	more direct knowledge of procedures, associations, routines etc. Consider how other's formalistic rules compare with own.	connections between reading and professional skills to guide mental simulations judgements and DM etc.	skills and their connection with formalistic rules
Distance learning Online Delivery	The issue of accessibility of courses and flexibility in completing them has driven the creation of e learning opportunities. Evidence points to online learning being mildly superior to people achieving learning outcomes than face to face teaching alone. However the most effective approach appears to be blended learning, mixing face to face and online delivery. The online delivery wasn't better per se, rather it appeared to offer greater opportunity to interact with the content and other learners (Means, Toyama, Murphy, Bakia, & Jones, 2009). One key issue that seems to impact on online delivery is trust around four domains; credibility, design of online system, responsiveness and care of instructor, privacy and security (Wang, 2015). Coaches interviewed by Mallett and Dickens (2009) suggested the required task of sharing details about themselves (in order to create a willingness to interact) with people they hadn't met was worrying. However they did all do it. In essence therefore, online delivery seems to offer a strong avenue for future coach development approaches so long as it can maintain the learning opportunities identified in previous rows of this table.				
Course Structure	Drawing on evidence relating to memory and learning, course contact, delivery, task setting and assessment would benefit from being distributed over a period of time with opportunity for revisiting key theoretical concepts for deeper consideration. Due to the inherent problems of work place suspicion and/or lack of awareness, it would make sense for formal educators to try and draw employers into course design and development in order to exploit the potential benefits of work based learning to both learner and employer.				

Table 5.8. Summary of methods to support learning in formal adult education.

5.9 CONCLUSION

Coach education, adult learning and professional development are all significant areas of research. As such trying to capture the essence of this research in one chapter has been a difficult task. However, while there will be some concepts missed, or not unpacked thoroughly enough, there is sufficient breadth and depth included to support taking an informed view on coach development. Returning to the concept of constructive alignment therefore and drawing on the contents of this chapter, a number of characteristics of effective coach education emerge.

5.9.1 Creating Programme Outcomes and Coach Capabilities

Prior to engaging in programme development effective coach developers must have a clear, evidence based view on what professional coaching is within the context that the coach is being prepared for. Furthermore, that this view must be expressed through coherent programme outcomes and/or competences with aligned and operationalized coach capabilities. At the professional level, therefore, the transferable professional knowledge and skills included in table 5.3 offer a starting point to guide thinking.

5.9.2 Assessment Framework

There are three overriding goals of any assessment framework aligned to programme outcomes. Firstly completion of it must evidence, in a valid and reliable fashion, that the coach has achieved outcomes and/or competences. Secondly, that feedback from these assessments must provide the coach with an opportunity to advance their professional knowledge and/or skills. Thirdly, that the coach must have a sense of ownership over the assessment process, recognising the process as being facilitative to their development.

5.9.3 Curriculum and Learning Activities,

As is evident from the six broad domains of knowledge listed in section 5.7, even accounting for aligning curriculum with programme outcomes, programme development teams must spend time deciding both what curriculum does and doesn't get included. As such effective courses must include concepts and knowledge deemed essential for progression toward and overcoming the programme outcomes. However, given that much more learning occurs outside formal programmes than occurs within, a significant set of curricula time must be devoted to helping coaches help themselves. This is achieved through the development of context specific, theory and evidence based effective self-evaluation and goal setting skills.

Continuing with the alignment concept, engaging coaches with curriculum requires the development of effective course design, learning environments and opportunities. As such, each opportunity must have a clear learning and development rationale explicitly linking to learning theory and programme outcomes. In other words, to discourage coaches from the implicit adoption of folk pedagogies formal coach development must to be sure to practice what it preaches.

5.9.4 Packaging Learning.

The apocryphal legend of three blind men and an elephant must be avoided. In this legend three blind men were asked to check out an elephant. One felt its leg and reported that the elephant was like a tree. Another focused on the trunk and reported similarities to a snake, while the third, feeling the elephant's side, compared it to a wall. All were correct but none right! The legend sends a clear message of the dangers of focusing too much on the parts and not on the whole.

Realistically, the final stage of course development, packaging learning is too often the first stage for those who develop formal learning programmes. In these circumstances programme coherence is often lacking to the detriment of the learner. Breaking learning into chunks is important to provide structure and building blocks for learners. However, an eye (and probably a package of learning) must be kept on the big picture so that the essential synoptic and nested decision making features of coaching are captured. As such just as there needs to be vertical alignment across programme outcomes, assessment frameworks, curriculum and learning activities, there also needs to be horizontal alignment between packages of learning.

5.9.5 Programmes Account For Individual Differences

Following the model of constructive alignment to identify effective programme development can lead to losing sight of learner going through the programme. Consequently the individual differences identified in section 5.6 offer numerous implications for programme access, design, content and delivery. Some of these individual differences are ripe for exploitation in design and delivery, such as PCDEs and the ideas of deep learning. However, others probably need more investigation but do offer some scope for designing course entry requirements such as cognitive dispositions. There doesn't seem to be any reason why these couldn't be included as course curriculum however.

5.9.6 And Finally..

The content of this chapter, including the characteristics of effective coach development offers ideas for more professional judgements and decisions to be made about the development of coaches capable of PJDM.

Following this line therefore, the recommendations offered here also allow for considered thinking about the creation of non formal professional development opportunities. For example, if there is a fully considered view on what a professional coach looks like in different contexts by an NGB, then workshops, conferences and social media platforms can be designed to align with this view.

Subsequently, coaches who are developed through this process should be better placed to make more informed decisions about how they engage in their own informal development. With a key characteristic of professionalism being the capacity to self-regulate, formal coach education must lead to the explicit development of this skill. Opportunities such as reading, watching videos, discussing with other informed professionals (not necessarily just coaches), social media etc. should all be entered into with some view as to what they can offer.

Finally, the level of thought required to engage in coach development at the level discussed here clearly places a great deal of emphasis on the quality of the coach educator. The question is, therefore, how many coach educators would be informed well enough to go through this type of debate? My experience is not many although some do and would be worth learning from. However, there is very little if any empirical data to support this experience. As such one of the first steps towards improving coach education and development will be to both understand what makes a good coach educator and to then improve the development of other coach educators. Such an approach should then facilitate the development of coaches who are better able engage in PJDM. This leads to the final study of this thesis in the next chapter.

CHAPTER 6 APPLIED TASK ANALYSIS OF COACH DEVELOPERS: DEVELOPING PROFESSIONAL COACH EDUCATORS

6.1 INTRODUCTION

In the previous chapter I suggested that the biggest impact to be had on developing coaches capable of PJDM will be through improving formal coach development practice. At the conclusion of the previous chapter, I sharpened this suggestion to identify that more needed to be known about the practice of effective coach developers. As such the aim of this chapter is to explore the practice of high performing coach developers. The work reported here reflects two separate but linked projects completed for Sports Coach UK and The (English) Football Association (The FA). The context of these projects (drawn from the specific remits identified by the commissioning bodies) was to identify the demands and working methods of high performing coach educators operating at a management and leadership level of coach development (the Sports Coach UK remit) and at the programme delivery and mentoring level (FA Remit) leading to the creation of a professional development programme of learning (The FA only). The goal of all the projects was to develop an informed view on the knowledge, skills and typical behaviours required to perform these roles.

In order to meet these requirements, the ACTA framework described in the previous chapter was applied to the data from these projects. While a full ACTA analysis wasn't possible with each project, when taken in combination, there was sufficient data to create robust cognitive demands tables, the end product of the ACTA approach. The importance of this flexibility is highlighted by the paucity of research examining the work of coach developers. Indeed, the only work of which I am aware consists of relatively weak descriptions within papers examining the experience of coaches on coach education courses (e.g. Piggott, 2012; Reid & Harvey, 2014). The application of ACTA principles to the data from the two projects is shown in Table 6.1.

	Task Diagram	Knowledge Audit Through Interview	Observation and debrief
Sports Coach UK	Yes	Yes	Debrief partially included with knowledge audit interview
The FA	Yes	Included with debrief of post session delivery for 3 participants	Observation only of 5 participants. Observation and debrief with 3 participants

Table 6.1. Overview of application of ACTA techniques to data collected from different projects.

6.2 METHODS

6.2.1 Participants

Drawing on the principle of purposeful sampling (Patton, 2002) 16 coach educators across 3 groups (see below) were recruited. All participants were sent an initial letter introducing the project team, the goals of the project and the data collection processes to be used. All participants also completed informed consent forms.

6.2.1.1 Group 1

Group 1 were 8 coach education managers for UK based NGBs. The 8 were drawn from a range of team and individual sports. 7 were male and 1 female. All were experienced coach developers (minimum 8 years). 2 of the coach developers had experience of progressing through the UK Level-4 endorsement process that is aligned at a postgraduate level. Another 3 of the coach developers oversaw coaching awards that were the 4th tier of their coach development pathway although these were not endorsed as UKCC level 4. 2 sports had coach development pathways to a 3rd tier.

6.2.1.2 Group 2

The second group were three (all male) coach developers engaged in formal mentoring roles in one to one development programmes with coaches from various sports. All three were full time coach educators, experienced in their role having worked in coach development for a minimum of four years in addition to be being very experienced coaches (minimum 10 years experience). All three were educated at postgraduate level.

6.2.1.3 Group 3

The third group were seven (6 male 1 female) coach educators engaged in delivering workshops as part of overall programmes of coach development. Five were engaged as guest speakers in two different programmes of coach development. These five had a mix of experience being one or more of; a national head coach, an HE lecturer, a performance director, full time coach education consultant. All had been involved within coach education and/or coach management for a minimum of 8 years. Two were educated to degree level, the other three were educated at postgraduate level. The remaining two were integral to the design and delivery of the coach development programmes being delivered on. These two were also part of the second group.

6.2.2 Procedures

As described in Chapter 5 ACTA Gore & McAndrew (2009) represents a focused and efficient method for unpacking the cognitions used by practitioners to complete their role using the following four steps:

- Step1: Production of a task diagram to provide the reviewer with a broad overview of the tasks involved in the role. See Figure 5.1.
- Step 2: The Knowledge Audit. This reviews the expertise required to complete the tasks identified in the task diagram. This audit was completed by exploring the tasks from Figure 5.1 against the ideas included in Table 5.3.
- Step 3: The Simulation Interview or Scenario with highly skilled practitioners (or alternatively observation of practice and debrief). This allows the exploration of hard to acquire ideas or semi tacit knowledge.
- Step 4: Creation of Cognitive Demands Tables. Essentially the output of the three preceding steps delivered in a user recognisable fashion, with relevant follow up explanation.

6.2.2.1 Step 1: Creating a Deductive Basis for ACTA of Coach Educators

Much of this focused efficiency comes from taking a more deductive approach to methodological design and data analysis. For the deductive purposes of this study therefore, Figure 5.1 (the validity of which was described in chapter 5 and is repeated below for convenience) was used as the basis for creating a task diagram against which coach educator work could be reviewed.

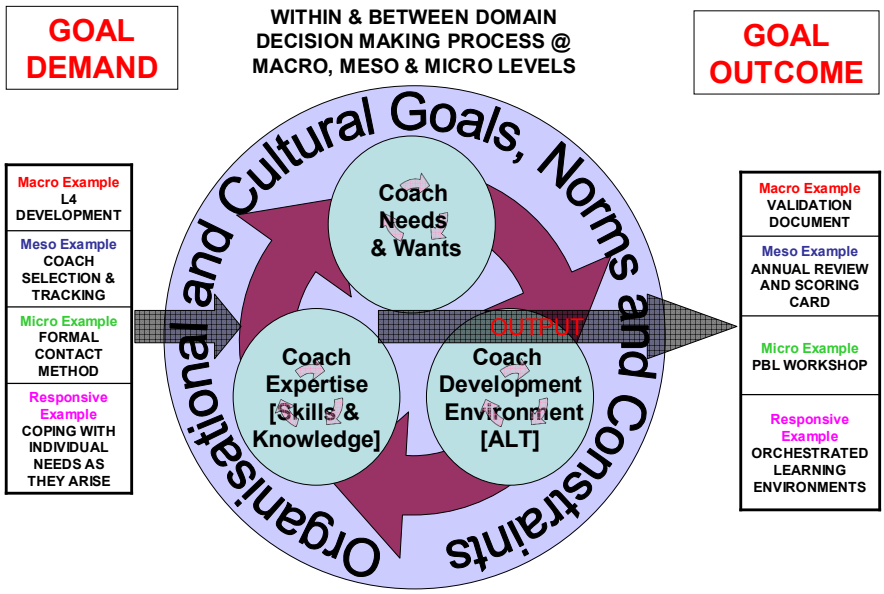

Figure 5.1: A model to guide coach education decision making processes (ALT: Assessment, Learning and Teaching)

Within this figure, five broad tasks of being a coach educator have previously been referred to (1-5 below). However, in keeping with the self-regulatory demands of being a professional, a sixth task of *Understanding Self* was also included.

1. Task Domain - **Understand Context, Culture, Strategy And Politics**[12] – Understanding the culture of the situation that is being worked in and adapting behaviour
2. Task Domain - **Understand The Coach** – Understanding the coach(es)'s motivations, needs and wants
3. Task Domain – **Understand Coaching Curriculum Development** – Understanding the curriculum that will need to be delivered to support coaches in their development
4. Task Domain - **Understand Adult Learning And Development** – Understanding how to most effectively develop learning environments to support adult learning
5. Task Domain - **Process And Practice** – Understanding the process and practice of coach development
6. Task Domain – **Understands Self** – Understanding own goals, strengths and limitations striving to improve when the opportunity exist

[12] Colour coding has been used to aid readability of the results coming from the 6 task domains over the next few pages.

Taken in combination these tasks and associated ideas provide a solid foundation against which coach education practice could be unpacked, explored and therefore defined.

While Figure 5.1 identifies the broad task domains that I expected coach educators to engage in, Table 5.3 (summary position of expected professional knowledge and skills within a decontextualized coaching domain) provides a basis to examine the requisite knowledge and skills that underpin these tasks. In short the design of questions and subsequent analysis of resultant data from both step 2 (knowledge audit) and step 3 (simulation interview) drew on the ideas of professional knowledge of professional skills applied in analytical and intuitive settings. In essence, Figure 5.1 and Table 5.3 formed the deductive basis of the analysis undertaken and equate to the completion of step 1.

6.2.2.2 Step 2: Knowledge Audit

Group 1 of the participant's underwent an interview lasting between 60 – 136 minutes that was audio recorded and then transcribed. Each interview was undertaken at a time and place convenient to the developer.

The interview questions were designed in order to access thoughts around the demands of developing high performing coach educators with questions being developed around the domains included in Figure 5.1. The original broad set of questions is outlined below.

- Could you tell me about your role within coach development and therefore the goals and priorities that brings?
- If you were looking to invest in the development of a high performing coach (i.e. if you were to recruit someone onto a qualification and/or CPD programme) what would determine the selection of that coach (i.e. what sort of coach are you looking to invest in?)
- What sort of factors impact (positively or negatively) on your ability to support the development of high performing coaches
- When you engage in the development of high performing coaches what goals are you working towards? What defines a high performing coach to you?
- What sort of education and development practices do coaches need to achieve expert/high-performing status?
- What role does assessment play in the education and development of expert coaches?
- How do you know if your coach development practices are 'correct'?

- Where has your knowledge of developing high performing coaches come from?
- What, if any, support would you like and where would/could/does this come from?

An initial pilot interview was undertaken with one of the 8 coach developers who was made aware of the pilot nature of the interview. Upon completion of the interview a debrief discussion was held to check for the efficacy of the questions in accessing relevant thoughts and knowledge the participant relevant to the aims of the project. The participant was happy with the content, nature and flow of the interview. The interview was included as a data set.

Subsequently, each further participant was sent a copy of the basic questions that were to be asked at least 5 days in advance of the visit by the interviewer. Following the original question and answer, follow up probes and prompts were used in order to ensure that a complete description was given.

6.2.2.3 Step 3: Simulation Interview

In ACTA the simulation interview offers the opportunity to "obtain information on the contextualisation of the job or task that is not easy to acquire" Gore & McAndrew (2009, p. 219). Typically, this is completed, as suggested, through a simulation. In this instance the opportunity to observe coach educators in practice removed the need to create a simulation, however, the rationale of using this approach to access contextualised knowledge (explicit and implicit) remained the same.

Consequently, both groups two and three were observed in practice and field notes were made. The focus of the field notes was developed around the domains included in Figure 5.1 and the ideas contained in table 5.3 both individually and integratively. The field notes were made on the assumption that I was observing naturalistic behaviour. As such notes were made on the basis of perceptual (where this was obvious), gesture and verbal behaviour as related to each of the six domains of figure 5.1.

Group two were engaged in a debrief conversations after their sessions. Notes were made from these conversations and they followed four key lines of questioning:

- What were the goals for the session? Where did those goals come from?
- What was the history leading up to that session?
- Why did you choose to engage with the coach in the way you did? (This question was contextualised by drawing on examples observed in the session by me). How did your understanding of that coach impact on the engagement?

- Where did your ideas come from?

6.3 STEP 4: DATA ANALYSIS, RESULTS AND COGNITIVE DEMANDS TABLES

All interviews, post session debriefs and field notes were content analysed using inductive and follow up deductive techniques as described by Miles and Huberman (1994). This approach allows for all interviews to be analysed for statements that offer an insight or opinion regardless of underpinning theory. Follow up deductive techniques assigned these statements against the six task domains of Figure 5.1. A sample of the interviews from group one were also analysed by a second researcher on the project. The field notes and ideas emerging from groups two and three were extensively discussed with members of the project team from the sport coaching group at Leeds Beckett University. Subsequent secondary analysis was again completed with researchers on the project team from Leeds Beckett University as the task analysis tables were constructed. Finally, a shortened version of this chapter (written for a conference paper - Abraham et al., 2013) was shared with all original participants. These participants were asked to check that they had been fairly represented by the findings of the study and respond if they thought this wasn't the case. None of the participants responded to suggest this was the case.

Table 6.2 displays an overview of typical responses from each of the data collection points. These have been deductively aligned against the 6 task domains from Figure 5.1. The responses from the Coach Education Managers are all verbatim. The responses under the three other columns are taken from field notes. The One to One debrief comments in particular represent paraphrased responses taken from notes.

Task Domain	Coach Education Managers Interview	Workshop Deliverers Observation	One To One Mentoring Observation	One To One Mentoring Debrief (Paraphrased responses)
Understand Context, Culture, Strategy And Politics	*…I think where we benefited from the politics in sport right now is that coaching is in an unprecedented position, particularly in Great Britain, I think you'd be hard pressed to go anywhere in the world right now where such an emphasis is being put on coaching, so that's been a very positive piece. We've been allowed to effectively go about and do our work, set the strategy, and we've got a lot of support because coaching is that important within all the partner organisations.*	All five of the workshop tutors enquired as to where their session fitted in with the bigger picture of the programme in general.	On entering the environment the coach educator was sure quick to acknowledge key figures. Shaking hands, engaging in some banter. Aims for the session were talked through with tweaks suggested and agreed.	I try to understand the world that they [the coach being worked with] are operating in. I've got all sorts of ideas for helping them improve what they do, but if it conflicts with what they are being told elsewhere then it can get them and me in trouble. Trust is massive in this game, you have to know where the power lies and make them know you are not there to threaten their position. This has to be about how I can help them.
Understand The Coach	*The enlightened coach would be the ones that say "I want to come on this to make me better at my job and give me more knowledge", and they are definitely more inquisitive, definitely a student of the game and will continue to be – I think the best coaches are the ones that are continuing students of the game going forward.*	All of the workshop tutors spent time at the beginning of their session asking the coaches present (there were never more than 15 coaches in a room) about their background.	Engaged the coach in conversation reviewing content previously covered, checking on progress	We're working on his ability to recognise his weaknesses that we've previously identified through a needs analysis. My job here was to prompt him to be more constructively aligned in his session delivery but I know how tough it is because it's what I'm trying to do with him. I've stated this up front and I think he appreciates me letting him know that this isn't easy.
Understand Coaching Curriculum Development	*…we have spoken to a few key individuals – mainly Head Coaches, Talent Development Coaches to see what their viewpoints are on our direction and what we are asking for,*	One deliverer in particular had created a set of models that he used to structure his delivery of the topics.	A clear focus on the session objectives of the application of skill acquisition theory to communication practice during feedback to the coach.	He's happy that I can support him in the use of skill acquisition ideas in his practice. We've worked on a set of ideas that we're implementing over a 2 month period that he's working on and I observe him on my

				visits.
Understand Adult Learning And Development	*"…the thing we need to do is have those people who know how to create a thirst for learning rather than put them off. Not to put them in awkward situations that drives them away from that.* *Because it would buy them into the process more thoroughly and assessment of that is an important part of the learning process. If I say "Right, I want you to do grouting" and then I come along and assess you, if you don't know what the assessment process is then you are less likely to be aware of what you are doing, and also I want them to be understanding of the assessment process because actually when I leave, or when we don't have an assessment they'll be using the same process in their behaviour, so I want them to believe in it and then use it and we use that as part of the process, so I'm a great believer in ownership because it provides understanding*	The use of a real world example where the presenter created a meaningful situation through the use of a case study of having to make a decision. Asking the coaches to engage in a task where they were to apply theory to examine their own approach to creating decision makers.	The use of a video recorded session with tags developed created meaningful coach centred review and reflection session. Pointed questions were asked to the coach that the coach seemed to be happy to engage with thoughtfully. Suggesting a level of trust.	I've found that the coaches really buy into the video review process. I've had to work hard to get meaningful footage and spent a lot of time in analysing the footage so that we can focus in on particular events. We use these sessions to try and stimulate some ideas about what can be done over the next few sessions.
Understand Self	*I think I have to continually up-skill myself. So like* [sport-specific European Governing Body] *conferences, I'll go to* [sport-specific European Governing Body] *conferences, I'll go to leadership and performance conferences that happen, anything I think would benefit me and my understanding of [the sport] in particular, or more leadership or more understanding of that.*		Engaging in challenging conversations. There doesn't seem to be any cynicism or negative emotion involved though. Challenging questions are met with considered responses.	All of the ideas that I am using with the coaches are the result of working with a group of colleagues who are really challenging of each other. There's a real sense of us being better than what is out there. I've been involved with some developers where all I've seen is people making money. When I've tried to challenge them the way we

				challenge each other at work it's met with polite but muted responses. I find it strange, as a group who are required to challenge others they are not open to challenge themselves.
Understand Process and Practice	…[my role is] *Head of Coach Development which caters for…grassroots right through to senior [professional game] Elite Coaching programme, developing programmes; I call myself a facilitator of programmes, identifying the best programmes that's available to help the coaches develop across, and aimed at our player framework.*	When engaged in Q&A sessions with the coaches all of the coaches were able to respond with meaningful answers. On tutor in particular would even turn the question around and draw the coach and the other coaches in the workshop in a two way conversation.	Standing alongside the educator while he was observing the coach in action, he was telling me that he was checking on how they were working on the coach's communication with large and smaller groups, also how he could get his feedback and questions more individualised as well. Our conversation ended abruptly and the educator walked off to talk to the coach as soon as he had finished talking to the group. Soon after the coach called an individual to him while the remainder of the players carried on with their task.	We've got some clear numbers that we have to get through the courses from the senior management that they're using to show we're having an impact and that's fair enough. We've also as a group defined our own goals about how we're trying to build buy from the coaches, develop a sense of trust with the clubs to ultimately see better coaching sessions for the kids. We've then worked out who is doing what across the country and how things will work out in practice. We're trying to stick to plan while also adapting to each environment. That nested thinking idea you've talked to me seems to reflect it, but I've got to think about that a bit more.

Table 6.2. Overview of typical responses from each of the data collection methods deductively aligned against the six task domains.

Following the deductive analysis of all data, and keeping with the ACTA approach therefore, the final result for this piece of research are presented as cognitive demands tables. for each of the six task domains using the structure of Table 5.3. As such, task domain relevant:

- *Professional Knowledge* and *Professional Skills* statements were created against *Analytical JDM* and *Rule Based and Intuitive JDM* applications.

Furthermore, to aid understanding typical

- *Leadership*, *Management* and *Coaching* behaviours

were created to suggest ways in which knowledge and skills are typically applied in the field.

The results of the cognitive demands are shown in tables 6.3 to 6.8. To aid readability and differentiation these are presented in different colours used in table 6.2

	Analytical JDM	Rule Based and Intuitive JDM
Professional Skills	• Actively engages in working with relevant sport policy when implementing role. • Conducts an informed analysis of organisational, group and individual strategy, politics and behaviour. • Develop professional and effective working relationships with key stakeholders (i.e. SPORT and Club personnel etc.) through considered and empathic communication. • Makes effective and informed decisions relating to the planning, implementation, monitoring, evaluation and regulation of nested programmes of development • Runs mental simulations of engagements with key personnel to support and critique planning • Records and proactively reflects on uncertainty experienced in everyday settings and generate innovative strategies and solutions to regulate and improve plans	• Has a strong situational awareness of goings on in working environment • Proactively and reactively recognises and responds to opportunities to support and progress stakeholders toward achievement of nested goal • Recognises uncertainty in everyday practice and selects relevant coping strategy
Professional Knowledge	• Works to an integrated mental model that encompasses a broad and deep knowledge base around relevant policy, strategic, emotional and political intelligence.	• Has recourse to a rich set of critiqued experiences of working within complex relationship situations where cues in the environment are accurately connected to a limited set of correct solutions
Typical Leadership Behaviours	• Actively engages and respects the opinions of key stakeholders in planning coach development programmes and interventions • Defines boundaries and expectancies of coach development programme	• Quickly identifies who main power brokers are and what their goals are • Quickly searches for and identifies common ground to break down barriers • Recognises and avoids the line between being positive and being patronising • Recognises when the remit or position is being overstepped and withdraws to a ‘safe’ position
Typical Management Behaviours	• Creates saleable message that can be delivered coherently and quickly • Builds on relationships in order to sell more insightful and potentially complex ideas to increase shared understanding	• Recognises opportunities to reinforce message and sell ideas
Typical Coaching Behaviours	• Develops plans for gaining trust and buy in with coaches and coach managers • Plans how to respectfully challenge behaviour and beliefs that are perceived as needing change.	• Recognises when coach is being threatened too much and backs off • Recognises when trust is being given and in order to exploit opportunities offered.

Table 6.3. Cognitive demands table for **Understand Context, Culture, Strategy And Politics**

	Analytical JDM	Rule Based and Intuitive JDM
Professional Skills	• Recruit coaches against stage relevant criteria and create high but realistic expectations • Work with the coach to review current capabilities, set personalised goals and monitor, review and regulate progress toward set goals • Build and maintain effective relationships with the coach • Design and apply methods of analysing and tracking coach development. • Develops a rich understanding of the coach's behaviour in different settings and contexts. • Develops metacognitive and self-regulatory skills of the coach • Runs mental simulations of how a coach will develop to support and critique planning	• Has strong situational awareness of coaches' working environment and its demands • Proactively and reactively recognises and responds to opportunities to support and progress coach toward achievement of nested goal • Proactively and reactively recognises and responds appropriately to moments of coach worry and/or stress when working with the coach • Recognises uncertainty in everyday practice and selects relevant coping strategy
Professional Knowledge	• Draw on connections between life experiences and contemporary applied theories from social psychology, performance psychology and sociology to critically evaluate, understand and plan for changing coaches' behaviour. • Draw on rich mental model of what coaching is and how it changes at different levels of competence to facilitate goal setting and coach tracking	• Has recourse to a rich set of critiqued experiences of working with coaches where cues in the environment are accurately connected to a limited set of 'correct' solutions
Typical Leadership Behaviours	• Creates clear vision of what good coaching is • Ensures the coach is making the required performance improvements and is displaying evidence of applying techniques independently • Models expected behaviour • Develops methods of analysing current coach capabilities (to be used by coach or coach developers)	• Provides a thorough rationale for all elements of practice when challenged • Quickly adapts predetermined developmental tasks to fit the performance of coaches • Responds with insight to questions posed • Uses relevant verbal and non verbal interventions at relevant times in coach development activities
Typical Management Behaviours	• Develops selection criteria for recruiting coaches into coach development • Organises regular updates to track progress	• Where possible adapts formal course demands to in line with demands being placed on the coach • Flexible in application of formal recruitment methods on a case by case basis
Typical Coaching Behaviours	• Shows empathy with and understanding of the change that coaches are going through • Personalises practice through individualised goals and support • Helps the coach critique their own performance • Encourages coach to take ownership of their developmental process • Creates a personal connection with the coach to make coaching conversations more successful and able to overcome any barriers to having critical discussions	• Recognises when to push and when to support coach • Recognises the need for coach to put forward own opinions • Keeps coaches focused on achieving developmental goals

Table 6.4. Cognitive demands table for **Understand the Coach**

	Analytical JDM	Rule Based and Intuitive JDM
Professional Skills	• Makes effective and informed decisions relating to the planning, implementation, monitoring, evaluation and regulation of nested programmes of learning and development • Develop and monitor relevant learning environments, tasks and communication strategies to meet learning goals • Adapt interpersonal, teaching and instructing behaviours to the needs of the coach(s) and context. • Design, deliver and evaluate meaningful learning opportunities and environments that meet the long-, medium-, and short-term learning needs of coaches • Runs mental simulations to support and critique planning for learning • Records and proactively reflects on uncertainty experienced in everyday learning settings and generate innovative strategies and solutions to regulate and improve plans	• Has strong situational awareness of the quality of learning environments • Proactively and reactively recognises and responds to opportunities to support and progress stakeholders toward achievement of nested goal • Recognises uncertainty in everyday practice and selects relevant coping strategy
Professional Knowledge	• Works to an integrated mental model that encompasses a broad and deep knowledge base of learning theories and their application to classroom, workshop, on line, work-based, mentoring, community and assessment learning opportunities.	• Has recourse to a rich set of critiqued experiences within the domains of operation where cues in the environment are accurately connected to a limited set of correct solutions
Typical Leadership Behaviours	• Works with a group of informed critical friends to develop constructively aligned learning programmes • Identifies most effective learning strategies for achieving goals of coach development in line with available resources	• Can offer justification for coach development programmes if challenged • Foresees issues with coach development ideas in meetings
Typical Management Behaviours	• Plans programmes of learning in line with available human, physical, financial, political and learning resources and coach availability	• Quickly identifies potential problems in programme delivery and identifies relevant solutions
Typical Coaching Behaviours	• Plans development sessions with learning objectives that link to bigger development picture plan • Creates a culture where coaches are encouraged to take ownership of learning and/or assessment • Creates a culture of coaches innovating, risk taking and developing new ideas • Demands that coaches are able to justify decisions • Creates tasks and assessment that are reflective and meaningful for coaches and related to improving coaching • Translates complex practice and theories into useable concepts and ideas through stories, analogies, metaphors and examples	• Observes performance and quickly adapts predetermined developmental tasks to fit the performance of coaches • Can offer justification for coach development methods if challenged • Uses relevant verbal and non verbal interventions at relevant times in coach development activities • Responds to questions with insight using stories, analogies and examples • Models risk taking and innovation in practice

Table 6.5. Cognitive demands table for **Understand Coaching Curriculum Development**

	Analytical JDM	Rule Based and Intuitive JDM
Professional Skills	• Design and/or understand developed coach development curricula that is aligned to SPORT coach development pathways/SPORT courses and to the needs of individual coaches • Analyse best practice coaching to maintain currency in coaching curriculum • Makes effective and informed decisions relating to the planning, implementation, monitoring, evaluation and regulation of nested programmes of curriculum • Runs mental simulations of coach development to support and critique planning • Records and proactively reflects on uncertainty experienced in everyday curriculum management and generate innovative strategies and solutions to regulate and improve plans	• Has strong situational awareness of how well curriculum is being delivered. Also a strong awareness of how well curriculum is be received and work with by coaches • Proactively and reactively recognises and responds to opportunities to support and progress stakeholders toward achievement of nested goal • Recognises uncertainty in everyday practice and selects relevant coping strategy • Recognises uncertainty in coaches relating to content to be learned and responds appropriately
Professional Knowledge	• Works to an integrated mental model that encompasses a broad and deep knowledge base relating to what good coaching is • Draw on connections between life experiences and contemporary applied theories from coaching science, developmental psychology and performance psychology to form clear rationale for coach curriculum	• Has recourse to a rich set of critiqued experiences within the domains of operation where cues in the environment are accurately connected to a limited set of correct solutions
Typical Leadership Behaviours	• Works with coach developers and other relevant stakeholders to critique coach development plans • Offers informed professional opinion on the development of curriculum	• Provides a thorough rationale for all elements of practice when challenge • Responds with insight to questions posed • Offers links between curriculum delivered and required improvements in practice
Typical Management Behaviours	• Creates curriculum relevant to level of coach development • Recruits and assigns relevant tutors to deliver • Creates relevant documentation to support formal coach development programmes	• Recognises logistical and personnel issues and responds with quick and accurate solutions • Provides a thorough rationale for all elements of practice when challenged
Typical Coaching Behaviours	• Sets meaningful learning objectives for development sessions • Plans tasks that are relevant to achieving learning objectives • Sets progressive curricula that relates at macro, meso and micro levels of nested plan	• Deliver verbal interventions with accurate information • Accurately assesses development progression in session • Quickly adapts predetermined curriculum to fit the performance of coaches

Table 6.6. Cognitive demands table for **Understand Adult Learning And Development**

	Analytical JDM	Rule Based and Intuitive JDM
Professional Skills	• Makes effective and informed decisions that reflect the big picture of coach development relating to the planning, implementation, monitoring, evaluation and regulation of nested goals and programmes of development • Runs mental simulations to support and critique planning • Records and proactively reflects on uncertainty and problems experienced in everyday settings and generates innovative strategies and solutions to regulate and improve plans • Recognise and resolve problematic and atypical issues through the generation innovative strategies and solutions • Knows own limitations and accurately identifies other experts to support work	• Is aware of goings on in working environment • Proactively and reactively recognises and responds to opportunities in everyday work to support and progress stakeholders toward achievement of nested goal • Recognises uncertainty in everyday practice and selects relevant coping strategy
Professional Knowledge	• Works to an integrated and explicit mental model of coach development that encompasses a breadth and depth of knowledge in the domains of; understanding process and practice of coach development, understanding the coach, understanding coaching, understanding adult learning and development, understanding context, strategy and politics, understanding self	• Has recourse to a rich set of critiqued experiences within the domains of operation where cues in the environment are accurately connected to a limited set of correct solutions
Typical Leadership Behaviours	• Negotiates goals with the coach and key stakeholders to create and manage expectations • Develops constructively aligned learning programmes • Communicates progress • Creates culture of learning • Creates a benchmark • Design and implement a planned and strategic approach to performance improvement	• Provides a thorough rationale for all elements of practice when challenged • Responds with insight to questions posed • Uses relevant verbal and non verbal interventions at relevant times in leadership activities • Models integrity, honesty, sincerity risk taking and deprecating behaviours to break down barriers and set expectations
Typical Management Behaviours	• Analyses the market that is being worked in • Develops plans that make most effective use of available resources • Creates partnerships to facilitate coach development • Develops a milestoned tactical plan with built in contingency • Develops methods to assess impact of coach development • Creates and develops effective coach developer teams	• Uses relevant verbal and non verbal interventions at relevant times in management activities • Models integrity, honesty, sincerity risk taking and deprecating behaviours to break down barriers and set expectations • Responds with insight to questions posed
Typical Coaching Behaviours	• Plans development sessions that link to bigger development picture plan • Creates high expectations and challenges practice • Creates an environment that is supportive of coach development • Gain trust of coach • Works to align needs established by benchmarking and wants established by coach • Makes the implicit explicit	• Quickly adapts predetermined developmental tasks to fit the performance of coaches • Uses relevant verbal and non verbal interventions at relevant times in coach development activities • Models integrity, honesty, sincerity risk taking and deprecating behaviours to break down barriers and set expectations • Responds with insight to questions posed

Table 6.7. Cognitive demands table for **Understand Process and Practice**

	Analytical JDM	Rule Based and Intuitive JDM
Professional Skills	• Conducts critically informed, evidence-based self-analysis in order to examine, expose and challenge the congruence of intentions, assumptions and beliefs with practice. • Works toward professional standards and values • Articulate personal coaching philosophy in order to take responsibility for own performance and on-going development. • Reflect continuously on coach development practice paying particular attention to uncertainties experienced, challenge personal assumptions and beliefs to improve future performance	• Recognises uncertainty in everyday practice and selects relevant coping strategy • Strives to recognise opportunities for self-development and to work towards personal goals
Professional Knowledge	• Draw on contemporary concepts and applied theories of coaching expertise, reflection, social psychology, performance psychology and sociology to critically evaluate the reasoning and resources of your own behaviour and practice in order to generate development goals and action plans.	• Has recourse to a rich understanding of self that recognises strength and weaknesses in knowledge, skills and personal effectiveness • Works to a mental model of personal effectiveness that includes psychological characteristics of excellence, professional values and ethics
Typical Leadership Behaviours	• Reflects with honesty and integrity • Plans to meet the needs of others first • Actively engages in policy and strategy development • Plans for putting self-improvement goals into practice • Models expectancies in decision making integrity, honesty, sincerity, respect, risk taking and deprecating behaviours to break down barriers	• Recognises opportunities to model expectations in decision making, integrity, honesty, sincerity, respect, risk taking and deprecating behaviours • Recognises and actions opportunities to work towards own leadership goals
Typical Management Behaviours	• Plans deliberately and objectively • Avoids, fire fighting and guessing. • Keeps working towards plans	• Ensures everyday practice stays to plan • Recognises and actions opportunities to work towards own management goals
Typical Coaching Behaviours	• Actively seeks trust and respect of coaches • Respects and trusts the opinion of coaches • Models integrity, honesty, sincerity risk taking and deprecating behaviours to break down barriers	• Recognises opportunities to model integrity, honesty, sincerity, respect, risk taking and deprecating behaviours • Reflects in action to create opportunities • Recognises and actions opportunities to work towards own coaching goals

Table 6.8. Cognitive demands table for **Understand Self**

6.4 DISCUSSION

Given the centrality of the coach educator to the development of coaches and the relatively poor views that are held on the value of coach education, it is surprising that more research examining the role of coach educators doesn't exist. In fact, based on literature searches, I can find no other primary data study that has been completed in this area. Indeed, a cursory glance through the (few) job descriptions that appear for coach developers in job adverts suggests that the results presented in Tables 1 - 6 have gone much further to defining the role of coach developers. Typically these job descriptions display a lack of differentiation between knowledge, skills and typical behaviours. This leads to nebulous statements, often lacking definition with their focus being around experience, leadership and operational factors. Whilst not surprising or unusual in poorly defined/immature professional vocations, this does limit the capacity to recruit and/or develop emerging and even established professionals in this domain.

Deductively analysing the coach developer role through the lens of PJDM and the coach development model has offered a thorough insight into the role of a coach developer. Developing cognitive demands tables (Gore & McAndrew, 2009) has served a relevant and meaningful purpose by offering (relatively) a precise and concise overview of the role thus progressing research forward. Furthermore it is against this definition that professional development approaches could be developed.

Further examination of the results in tables 6.3 to 6.8 does reveal a level of replication of skills, knowledge and behaviours. This should not be surprising however; the tables (and the domains they reflect) are not meant to be orthogonal, they represent parts of one big picture of being a coach developer. Furthermore, creating the tables through multiple sources of data means that they are informed through a wide peer group thus removing the chance of bias and ideas being missed.

As such, within the under researched role of coach developers, these tables offer a significant addition to the literature and to coach developers. The tables offer the capacity for a benchmarking exercise against which the role demands of a coach development job can be mapped. Also, the current skills and knowledge of both recently employed and experienced coach developers can be challenged against the content of the tables. Finally, analysing both with the role demands and the capacity of coach developers to meet those demands allows informed judgements to be made about professional development needs and programmes to be created.

Caution is needed however. These tables are created from multiple participants who complete the role of coach developer across different contexts with differing goals.

Consequently, the tables are cumulative in nature and therefore not reflective of one single person. In other words the tables created above are aspirational. Furthermore, I must also acknowledge that the methodology of ACTA has been in a post hoc fashion. I am confident that on the whole this post hoc application is appropriate and has produced results that have validity in the field. However, research need to be replicable and therefore it is advisable that future research should be deigned against ACTA prior to data collection. So, while the cognitive demands tables created are useful in the ways described in the previous paragraph, their limitations must also be recognised.

The tables are a well informed (i.e. informed by theory and practice) and succinct summary of the demands of a coach developer role based on the participants involved in the study and a summary of relevant research in the area of PJDM. However, coach developer research is in its infancy, as indeed is the role. As the role of coach developer becomes more professionalised the current tables should be re-evaluated as further research is completed. Furthermore, as stated in Chapter 5, sport coaching as a domain has previously been, and continues to be drawn to the behavioural competency approach to defining vocational roles, The lists of skills and knowledge identified in Table 6.3 to 6.8 may be seen as *grist to the mill* of those indoctrinated to the competency based approach. However, this has most definitely *not* been a competencising exercise; rather the tables display a set of ideas that attempt to capture the essence and complexity of coach development roles. They are a source of evidence that can inform self analysis and/or the development of Learning Outcomes or Professional Competences as described in the previous chapter.

I believe there remains much work that could and should be done within this domain. I am confident that the application of PJDM has brought much needed focus to the role of coach developers. Indeed the explicit recognition of the analytical *and* rule based/intuitive demands of this role allows for more informed debate about the connection between theory and practice, thinking and doing, academic worlds and applied worlds. In short this sort of work allows artificial barriers to be broken down as it recognizes the skills and knowledge that all involved have. However, PJDM also strongly highlights the role of; perception, mental models, shared mental models, routines and recognition primed decision making in determining how people perform their roles. The content in the tables makes specific reference to all of these ideas however, it doesn't completely unpack them, and viewed from this perspective I may have only scratched the surface.

For example, gaining trust (of the coach but also the club officials) was seen as being crucial for the coach developers within the FA. As such the statement 'Recognizes

when trust is being given in order to exploit opportunities offered' was included in Table 6.1. However, I was not able to spend enough time with the coach developers on this specific topic so that I could unpack what perceptual markers were being identified that led to the coach developers feeling like they were being trusted. Indeed across all 6 tables, *recognises, perceives, identifies* are used frequently to express the importance of perception in making judgments. In most of these cases more work is required to unpack what these perceptual markers are. Indeed routines, mental models etc. used in these roles all need further investigation.

6.5 DEVELOPING A POSTGRADUATE CERTIFICATE[13]

Finally, the findings of the ACTA process were used to develop a professional development programme for a group of FA coach educators. In order to achieve this goal I was able to apply the characteristic of effective programme development summarised in the conclusion of Chapter 5. This approach led to the commissioning of a Post Graduate Certificate (PG Cert) in Coach Education for a group of Youth-Coach Educators. As such I conclude this chapter by briefly exemplifying how many of the recommendations in this thesis were put into practice through the design of this PG Cert.

Drawing on the constructive alignment model to structure the thinking process the following judgements and decisions were made in the development of professionally relevant PG Cert.

Initially there were a number of contextual factors to contend with:

- The FA requested certificated professional development however, they were only able to commit to a PG Cert. This immediately placed constraints on the number of learning outcomes that could be reasonably achieved in the time and the number of packages of learning (modules) that could be delivered.
- The coach educators who would undertake the PG Cert were already employed and working long hours across England and Wales. This limited frequency of contact.
- The FA and the coach educators were open to experimenting with ideas in the field, but within reason. There was a lot of potential for work based learning.
- The coach educators were all highly experienced as coach educators and/or as coaches working in the environments that they would be going into. The assumption was that mental models existed and that perceptual skills would be strong. The

[13] The tables included in this section are the work of the Leeds Beckett academic group that I am the lead for.

focus therefore was on offering up procedural rules to bring structure to RPD practice and reflection. This would be supported by the delivery of some key declarative ideas across the six task domains to improve understanding and questioning of experiences.

- Choosing an HE delivery option meant that the Level 7 guidance outlined in Chapter 5 would be followed and Learning Outcomes rather than professional competences would be written.

Drawing on these contextual issues and the ideas captured in tables 6.3 to 6.8 learning outcomes with aligned coach capabilities were developed.

Programme Learning Outcomes		**Professional Skills**	**Knowledge and understanding**
1.You will be able to make, defend and critique professional judgements in order to:	1.1 Critically evaluate developmental needs and wants of the individual coaches with whom you work in order to personalise practice	Design and apply methods of analysing and tracking participant development. Set personalised goals and monitor, review and regulate progress toward set goals	Demonstrate a critical awareness and application of social sciences relevant to the participant and own role
	1.2 Work with stakeholders to proactively influence the coaching context	Conduct an informed analysis of organisational, group and individual behaviour. Develop professional and effective working relationships with key stakeholders (i.e. parents, managers etc.) through considered and empathic communication.	Draw on contemporary applied theories from social psychology, performance psychology and sociology to critically evaluate the reasoning and resources of people's behaviour and social structures in order to identify and explain how they shape and influence your coaching role and practice.
	1.3 Reflect on and interrogate personal intentions, practice and their alignment in order to generate personal development goals	Conduct critically informed, evidence-based self-analysis in order to examine, expose and challenge the congruence of intentions, assumptions and beliefs with practice. Articulate your personal coaching philosophy in order to take responsibility for own performance and on-going development.	Draw on contemporary concepts and applied theories of reflection, social psychology, performance psychology and sociology to critically evaluate the reasoning and resources of own behaviour and practice in order to generate development goals and action plans.
2.Plan, deliver and evaluate long-term programmes of development to meet the needs, motives and entitlements of others.		Make effective and informed decisions relating to the planning, implementation, monitoring, evaluation and regulation of nested programmes of development. Evaluate the interdependent relationship between the programme objectives, learning / practice structures / methods, interpersonal style / coaching behaviours, participant and stakeholder engagement in order to determine and develop personal and programme effectiveness.	Critical application of models and theories of professional judgement and decision making (PJDM) to the process of coaching. Synthesise, test and integrate relevant theories from social and physical scientific disciplines with own beliefs to define and solve typical and non-typical coaching problems. Critically reflect on judgments to analyse own coaching practice in order to develop a personal theory and philosophy of practice.

Table 6.9. The programme learning outcomes for the PG Cert.

As a consequence of, and at the same time as, developing the programme learning outcomes as a team we worked on the development of knowledge content, assessment methods and learning approaches, again within the constraints of the role and against the cognitive demands tables. As a result, three modules were developed. The mapping of these modules against the six task domains is shown in Table 6.10. In Table 6.11 the aims, learning outcomes, delivery methods and assessment methods are shown in more detail.

Domain	**Modules**		
	Understanding Expertise	Coach Education: An Overview	Coach Education: Personalised
• UNDERSTANDING CLUB AND FA CONTEXT, STRATEGY AND POLITICS			
• UNDERSTANDING THE COACH			
• UNDERSTANDING ADULT LEARNING AND DEVELOPMENT			
• UNDERSTANDING COACHING CURRICULUM			
• PROCESS AND PRACTICE			
• UNDERSTANDS SELF			

Table 6.10. How modules aims and outcomes map to six domains of knowledge and skills. Different shading displays where the emphasis of content maps across, darker shading reflects a greater emphasis.

	Understanding Expertise	**Coach Education: Personalised Learning and Mentoring**	**Coach Education: An Overview to Course Design, Delivery and Assessment**
Module Aims	This module will provide an overview of the cognitive and social factors that define expertise. This will be applied specifically to the role of people operating in the field of coaching; i.e. coaches and coach educators. Given this overview students will be required to benchmark their current status and set goals relative to their role and future aspirations.	This module aims to support the learner's development as an independent, reflexive practitioner who is capable of sustaining enquiry into aspects of his/her professional sports coaching practice. The module offers the learner an opportunity to plan, implement, analyse and revise and reflect on a sustained coaching programme, to demonstrate appropriate professional competences in a way that integrates the key elements of the coaching process, and to demonstrate sound academic practice in investigating in depth a specific area of applied practice.	Drawing on the experiences that students already hold, this module will give an overview of the integrative factors involved in designing, delivering and assessing coach education courses. The focus will be on Level 3 & 4 UKCC and/or NCQF Levels 4-7, however, some consideration will be given to the needs of novice coaches operating at Level 1 & 2 UKCC.
Module Learning Outcomes	Reflect on and interrogate personal knowledge, beliefs, intentions, practice and their alignment in order to generate personal development goals Work with stakeholders to proactively influence your coaching context Critically evaluate developmental needs and wants of the individual participants with whom you work in order to personalise practice	Plan, deliver and evaluate long-term programmes of performer development to meet the needs, motives and entitlements of others Critically evaluate developmental needs and wants of the individual performers with whom you work in order to personalise practice Reflect on and interrogate personal intentions, practice and their alignment in order to generate development goals Work with stakeholders to proactively influence your coaching practice	Plan, deliver and evaluate programmes of coach development to meet the needs, motives and entitlements of others. Critically evaluate developmental needs and wants of the individual coaches with whom you work in order to personalise practice Work with stakeholders to proactively influence your coach education context Critically evaluate theories of learning in order to design and implement learning environments relevant to achieving long, medium and/or short term goals
Module Content	Coaching practice as a Nested Professional Judgement and Decision Making Process Role of biases and dispositions/traits in influencing personal practice and development Role of metacognition and mental skills in self-improvement and development Recognising and defining coaching effectiveness as aligned against own context and goals Models of coaching and required knowledge Models of reflection Completing self-analysis: 360 Reviews	Models of coaching practice, coaches' practice, coach development and mentoring Using theories and concepts as thinking tools to identify and understand coach mentoring issues and generate coach mentoring strategies Cognitive Behavioural, Gestalt, Solution Focused and Strength Based perspectives in coaching Framing the coaching relationship – contracting (establishing the purpose, boundaries, expectations, timescales). Using 360 review, observations, audio and video capture to provide meaningful feedback and support reflective conversations Examining a coach's developmental pathway, coaching perspectives, coaching role and performance to generate short-, medium- and long-term development objectives Models of effective communication	Constructive alignment Autonomy supportive environments Competency vs Professional Competence Cognitive and social constructivist learning theory Programme design

	Understanding Expertise	Coach Education: Personalised Learning and Mentoring	Coach Education: An Overview to Course Design, Delivery and Assessment
Teaching Approach (inc Tasks)	Four classroom days spread over 4 months Tasks to be completed between each delivery day. Tasks responses shared, where possible, with other students online Contact days delivered through mixture of interactive lectures, problem based workshops, student presentation/feedback sessions.	Module delivered through 4 full days distributed across 8 months Learning activities are set between workshops that challenge coach mentors to draw on relevant concepts and theories and apply them in their coach mentoring practice. Coach mentors are invited to share their learning with their peer group through an Appreciative Inquiry process. The workshops are structured around using key theories and concepts to work through the four key themes of the module: Framing the coaching relationship Generating meaningful feedback Designing, implementing, monitoring and reviewing a coach development plan Delivering successful coaching conversations	Four classroom days spread over 4 months Work based formative learning tasks sent via online platform. Reading set from book chapters and academic journals
Assessment Method	3000 – 4000 word self-analysis that examines own practice and beliefs against the standards of theories and data collected from significant others (i.e. other coaches, athletes, parents, etc.). Concludes with goals for own future development. Students are offered opportunity to influence grades by engaging in peer review in groups of 3 or 4.	Combined assessment 1 (45 minute presentation + Peer review) Develop or Critique and justify a nested coach development plan of development relating to needs of relevant stakeholders Using the nested plan as a base to work from undertake a critically informed evidence-based analysis of a coach's development needs in order to generate a set of long-, medium- and short-term goals. Combined Assessment 2 (70 minute presentation + Peer Review) Implement, adjust and monitor the nested plan and generate an understanding of what is working for whom in what circumstances and why. In particular, design, deliver and evaluate meaningful mentoring opportunities that meet the long-, medium-, and short-term learning needs of your participant. Conduct a critically informed evidence-based self-analysis to determine personal and programme effectiveness and develop recommendations for future improvements in the programme and for self.	

Table 6.11. Summary of the three modules with aligned outcomes, curriculum, teaching/delivery approach and assessment.

6.6 CONCLUSION

The overall goal of any professional development must be to improve practice in order to become more efficient and more effective in achieving goals. For coach developers therefore, any professional development should lead to them being better at developing better coaches. In order to achieve this goal, this chapter has identified that a, personalized, deepening of knowledge across the six domains should lead to improved awareness. However, both the deepening and awareness raising of knowledge *must* also lead to enhanced professional skills if there is to be an impact on practice and this must be obvious to the coach educators if they are to buy into the professional development. The completion of this work has enabled the development of a bespoke postgraduate diploma course for the FA in order to facilitate the professional development of a selection of their coach education staff. Using the PJDM framework and aligning (even approximately) with the ACTA methodology has allowed this course to be evidence based and aligned with the needs and wants of the coach educators.

The impact of the PG Cert course reported here is being measured in part by other researchers as part of a larger impact study for The FA so I cannot point to primary data. However, feedback from those who engaged with the course has been extremely positive. A box of wine from one participant with a card stating it had been the most beneficial piece of professional development that he had been on stands out! Perhaps more tellingly we (my colleagues and I) have been invited to run another course in autumn of 2015. It is likely that I will look to run a tracking study as part of this future course.

CHAPTER 7 CONCLUSION AND RECOMMENDATIONS

7.1 RESTATING THE RESEARCH PROBLEM

At the beginning of this thesis two broad questions were posed; what is coaching and how do we develop it? The aim for this conclusion therefore is to answer these questions by drawing on the major discursive findings from each chapter of this thesis. Furthermore, in reaching answers to these questions I offer recommendations for future research.

7.2 WHAT IS COACHING?

Realistically, answering such an ontological question in a single thesis is all but impossible. However, following such a period of investigation I should, according to the work of Entwistle and Peterson (2004), be at a stage where I can commit to a personal reasoned perspective to questions such as these. As such, the answer I offer here is a personal reasoned perspective is drawn from the major findings of this thesis.

I have previously identified that coaching has been described to happen at multiple levels of competence (e.g. novice, intermediate, expert) and in multiple contexts. However, this thesis has been focused on the issue of professional coaching and therefore this sets the delimitation of the response to the question of, what is coaching.

Responding to the question and drawing on the contents of this thesis therefore, the following view is offered:

Professional coaching is a goal led Professional Judgement and Decision Making process. It requires the application of explicit (formalistic and substantive) and tacit knowledge in making judgements about setting and achieving athlete development and performance goals within and while negotiating socio-political environments. These judgements and decisions are made using both classical and naturalistic methods drawing on analytical, recognition primed and intuitive processes. Furthermore, these judgements and decisions are completed through nested thinking that connects the long-term strategic goals and plans with everyday practice. PJDM and nested thinking is a fluid, dynamic feed-forward and feedback process that is regularly monitored and adapted based on progression towards or the emergence of new goals. The capacity to operate at this level of coaching performance is dependent on having a professional knowledge and skill base that emphasises understanding, perceiving, simulating,

diagnosing, solving, planning, situational awareness, embracing uncertainty, reflecting and self-regulating.

The definition provided above is clearly generic to professional coaching. Indeed, if it didn't include the comment; 'goals of athlete development and performance' there would be an argument that the definition could be directed at any professional. However, when aligned with the suggested knowledge bases of; understand athlete, sport, pedagogy, context, process practice, and self, then it is possible to see how the definition would connect to everyday coaching problems such as creating vision and goals, long term planning, relationship building, athlete focused curriculum planning, effective practice design, practice and competition interventions.

In creating this answer I am able to draw on the proposed theory and subsequent findings of this thesis. For example, chapter 2 introduced and justified how and why the theory and process of PJDM can enhance our understanding coaching practice and development. In particular the following ideas were introduced to provide a basis to examining coaching;

- Decision making methods: NDM/Type 1, CDM/Type 2, RPD, Nested Thinking
- Professional practice
- Knowledge types: Formative vs Substantive (folk) theory, Explicit procedural and declarative knowledge, tacit knowledge
- Knowledge sources: Pedagogical, Political and Self Regulatory

In chapter 3 I drew on the ideas included in the first three bullet points in order to examine the problem solving and decision making of athletics coaches. The evidence drawn from asking coaches to engage in a contextualised problem clearly pointed to how coaches had a preference for RPD approaches to decision making that drew on their substantive rather than formalistic knowledge sources. This supported Kahneman's (2011) and Yates & Tschirhart's (2006) view that humans prefer to avoid the more cognitively demanding type 2 and formalistic approaches when making decisions. However, the use of an 'uncertainty' manipulation did move coaches to be more considered and 'theoretical in their thinking. This provided evidence that coaches are capable of and do engage in PJDM, albeit only when pushed, at least in this study. In other words, self regulation and self control are key to professional practice.

In chapter 4 I built on the issue that presented itself in chapter 3, that some coaches may not ever think they make the wrong call. In other words, while the majority of coaches in chapter 3 identified alternative 'more professional' strategies in response to uncertainty, others refused to acknowledge this would happen. This finding tied in with

my experience of working with coaches over numerous years of coach education and made me wonder if there was more to the capacity to being a professional that simply an approach to DM and knowledge use. In this study therefore I introduced the theory that epistemological and metacognitive development may offer an insight to the individual differences observed in coach practice and development. The results presented in this study supported the view that the capacity to engage in and self-regulate learning behaviour may well be a significant factor in whether coaches can and will ever engage in PJDM.

Finally, chapter 5 synthesised the work of several authors who examine the broad issue of expertise and professionalism in practice. This led to the production of a synoptic and evidence based view of professional coaching. This view drew on the theory of PJDM and aligned theories identified in the four bullet points producing a summary of expert professionalism (see table 5.3) that is encompassed in the shortened table 7.1.

Principle	Characteristic	
Professional Knowledge	Mental Models	
	Declarative Knowledge	
	Procedural Knowledge	
	Perceptual Skills	
	Sense of typicality and associations	
	Routines	
	How to think, problem solve and learn efficiently	
Professional Skills	Plan and re-plan nested goals and operations	
	Generates and tests innovative/creative ideas	
	Run mental simulations in order to; diagnose, explain, form expectancies	
	Situational Awareness	Spot anomalies and detect problems
		Find leverage points, opportunities, chances to improvise
		Assess complex situations
		Manage attention
	Manage uncertainty	
	Self-Regulation	Organise and engage in professional development and practice
		Works within capabilities
		Evaluate performance and work on weaknesses
		Cope with job and self improvement pressures
		Stay aware of what others in similar positions are doing

Table 7.1. A summary of the demands of being a professional practitioner.

Given the evidence presented in chapters 2-5 of this thesis I am confident in the committed personal reasoned perspective that I have offered. PJDM as a theory and process has been researched, tested and subsequently presented results that can support the theory and provide an evidence base for the definition of professional coaching that I have offered. However, this is not to say the perspective is without uncertainty, an issue I will return to in my recommendations later in this chapter.

7.3 HOW SHOULD PROFESSIONAL COACHING BE DEVELOPED?

Based on the evidence presented in this thesis the simple one word answer to this question; professionally. As discussed in Chapter 5, several authors (Abraham et al., 2006; Cushion et al., 2009; Nelson et al., 2006) have presented evidence for the preference of coaches to learn through informal methods. As I referred to in Chapter 5, this is understandable from a self-determined point of view since coaches are able to exercise autonomy over their development choices. However from a professional development point of view this not a satisfactory position. As is explored and evidenced in chapters 3 and 5 when left to consider options humans have a tendency to lack criticality and effort in their thinking. While this is not true for everyone (as suggested by dispositional research in chapter 5) there seems little doubt that learning climates and expectations benefit from having some level of external/extrinsic quality assurance that *demand* thinking (ideally critical). Further to this external regulatory approach however, the need for professions and professionals to engage in peer review to drive thinking also identifies a need for formal education to create some regulatory framework that demands peer engagement. Only through these processes will the basis for adults and sport organisations who are better able to make most use of their informal and non-formal learning time be dedeveloped.

As such, based on the findings of this thesis I took the position that the biggest impact that could be had on preparing coaches for professional practice (which would be inclusive the capacity to engage in informal self improvement) would be to improve formal coach education.

In essence formal coach education needs to practice what it preaches through the engagement of PJDM. Course design, delivery and evaluation needs to be based on judgements and decisions that draw on formalistic knowledge. This formalistic knowledge needs to be derived and synthesised from the areas of understanding what professional coaching is, adult learning and education, curriculum building, individual differences and the context of professional education. All aspects of the development process need to align with each other in order to make most efficient use of the resources; people, time, finance, facilities, to facilitate the development of coaches capable of PJDM. Examples of good practice therefore would be; aligned programmes, autonomy giving assessments, trust based critical peer to peer engagement, opportunities for in practice accurate and timely feedback and role relevant curriculum.

Given such demands it is crucial that high level professional coach developers are in place to deliver formal professional development programmes. As such the generic nature the defined professional operator in Table 5.3 should be used to identify and develop coach developers. These coach developers should be capable of engaging in PJDM across the six domains presented in Tables 6.3 – 6.8. Given the current status of coach development within the UK this will require some significant investment in staff development for coach developers in order to improve the quality of professional development for coaches. Furthermore, that this professional development again needs to practice what it preaches when it comes to design, delivery and evaluation. There are clear implications here for policy development and allocation of resources by government agency and sport federations.

In support of these statements, I am able to further draw on the evidence presented in this thesis. Chapter 3 displayed an apparent need to educate coaches in the necessity to recognise when they are engaging in and therefore to avoid folk based substantive decision making. In Chapter 4, the evidence presented identified that individual differences in approaches, willingness and capacity to engage in professional development need to be accounted for in both formal and informal settings. Chapter 5 presented a review of evidence from other researchers about what the goals of professional coach development should be. Furthermore, I identified two broad formalistic rules in constructive alignment (Table 5.1) and the coach education decision making model (Figure 5.1) that can guide the exploration and development of professional development programmes. Finally, Chapter 6 provided evidence of the demands of being a professional coach developer.

7.4 RECOMMENDATIONS FOR FUTURE RESEARCH

Given the coaching and coach development focused research questions examined in this thesis my suggestions for future research remain in these domains.

I have presented an evidence based view of coaching as a PJDM process within this thesis. However, more work needs to be done to examine the application of the theory to coaching, and to understand how the very best coaches (expert professionals) engage in the process. For example, I have identified nested PJDM as being an effective method of engaging in PJDM, yet more research needs to be completed in exploring the application of this concept in and for coaching. How do coaches engage in thoughtful goal setting and planning at the strategic political level of practice? How does this level of thinking then influence a coach's capacity to engage in being politically and tactically aware in setting, tracking and evidencing performance and

development goals? Indeed in asking these questions I am drawing attention to the fact that relatively little is known about how explicit formalistic knowledge used in CDM links with NDM. From a NDM point of view, situational awareness and perceptual skills are crucial to practice, yet there is little evidence relating to the perceptual cues that coaches attend to in practice in order to engage in NDM/RPD. As such this represents an area ripe for exploitation. As an aligned view, increased evidence as to which theoretical/formalistic concepts are drawn upon within RPD when faced with different contexts would add to our understanding of how coaches engage effectively in naturalistic environments. This view would also inform understanding relating to the connection of CDM to NDM.

Drawing from the views offered related to coach development in the thesis a number of research questions become obvious. Firstly, each of the questions relating to understanding the application of PJDM for coaching apply equally the work of coach developers. In fact, given the dearth of research examining the practice of coach developers *and* their importance in developing coaches I suggest this is a priority area for research. For example, creating and/or developing trust seems particularly important for creating *critical* environments with coaches or gaining access to and influencing working environments. However, very little about how trust is created or recognised by coach developers in either of these circumstances.

Finally, further to examining the practice of coach developers, the findings of this thesis present a number of theories that are applicable to examining the role of formal coach education in improving coaching practice. For example, there are number of individual difference based theories could be investigated to examine their influence on the development of coaches within coach development programmes. PJDM as a theory offers a number of characteristics of coaching practice though knowledge and skills that could be monitored to examine the impact of formal coach development programmes. Longitudinal research programmes that track coach development seem to be a crucial direction for research. Indeed, examining the role of formal coach development on the engagement in informal self development and the effectiveness of practice would be particularly welcome at this time.

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