Professional Judgement and Decision Making in Sport Coaching: To Jump Or Not To Jump

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ABSTRACT

Recently there has been increased interest in using Recognition Primed Decision Making (RPD) to examine and understand decision making of sport coaches in time-limited situations. Furthermore, there is also an expectation that Type 2 classical decision making (CDM) would be used within coaching since time is often available to make judgements and decisions. Finally, given the scientific underpinnings available to coaches we would expect greater use of formalistic rules rather than substantive heuristics through the application of RPD and/or CDM in coaching. However, despite these ideas relatively little is known about the actual decision making behaviour of coaches in practice. Against this premise 12 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. 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 'expert' in their DM behaviour but may not use this capacity unless pushed to.

KEYWORDS

Formalistic rules, substantive folk heuristics, professionalism, analytic decision making, recognition primed decision making (RPD)

INTRODUCTION

In their position paper, Kahneman and Klein (2009) agreed that decision making had the capacity to become biased and flawed through overconfident reliance on and application of heuristics to solve problems and make judgements. Such overconfidence would be borne out of thinking that a swift naturalistic judgement and decision can be made based on 'experience' when in fact a more thoughtful approach should in fact be taken. It is in this space of flawed judgement and decision making that 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 drawing on 'folk pedagogy' (Abraham & Collins, 1998; Gould & Carson, 2004). The suggestion being that, while this folk pedagogy may have value, its experiential source often means it is without theoretical or critical basis. Such a position has consequences for identifying coaching practice through the lens of professionalism – a stated aim of the International Council of Coaching Excellence (ICCE, 2010). For example Carr (1999) has 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 aware peer group. The question that arises is; does the reality match the hypothesised ideal approach? Do coaches engage in professional decision making in all of their decisions? In order to understand this question it is useful to explore the system 1 and 2 typology of put forward by Kahneman, (2011) and the recognition primed decsion making (RPD) theory suggested by Klein (2008).

Kahneman offers useful insight, about which system type is used and when. For example, 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 Type 2 system as '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 defined earlier. 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.

In contrast to Kahneman, Klein and colleagues own work has focused on examining how practitioners can and do make 'professional' (or expert) fast Type 1 naturalistic decisions (NDM) in pressurised circumstances; for example, fire fighting (Klein, 2008). Klein argues that professionals *are* able to consistently able to 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). 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. There are three levels to the RPD model that are enacted according to how just how recognizable the perceptual cues are. In his work examining volleyball player decision making Macquet (2009) summarised the three levels to:

1. *Simple Match*. At this level cues in the environment immediately and automatically match, with no or extremely limited conscious activity, with a decision and action.
2. *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 experiential knowledge, both tacit and explicit, to simulate what may have led to the situation. A view is quickly established and that matches a course of action and a decision is made.
3. *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 experiential knowledge, will then mentally simulate the consequences of one or two actions before choosing a course of action.

All three levels of RPD are fast acting, while 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 2 process, there is a further argument that even here the use of system 2 is not as deliberate as perhaps it could be. 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; <u>R</u>educe uncertainty by collecting additional information, make <u>A</u>ssumption, <u>W</u>eigh up pros and cons, <u>F</u>orestall[1] would align with Klein's view that professionals engage system 2. However, these and other authors identify that the use of system 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). Klein argues that the satisficing process is still 'expert' or 'professional' since their data identifies that this satisfying process leads to correct courses of action more often than not. This 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, typically framing expectancies from perception 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 satisficing rather than optimising – bringing into question just how 'professional' the approach is or can be.

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 and sport psychology (Abraham, Collins, & Martindale, 2006; Martindale & Collins, 2012) 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 (Knowles & Gilbourne, 2010; Strean, Senecal, Howlett, & Burgess, 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 practice. However, even though coaches (and other sport professionals) typically do have more time available to

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[1] The underlined capital letters spelling RAWF. The missing S relates to a 5th option, which is to simply <u>S</u>uppress uncertainty.

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 a fully analytical DM is not possible? Is professioanal decision making possible in naturalistic settings? The answer to this question must be in the way that the Type 1 and Type 2 processes talk to each other.

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:

- *Full analytical DM*. This strongly relates to the analytical Type 2 DM suggested by Kahneman (2003).
- *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 (Macquet, 2009).
- *Automatic/intuitive* DM. This strongly relates to the Type 1 ideas of Kahneman, (2003) and the Simple Match option of RPD Macquet (2009).

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* approach to making judgements and therefore making a decision. They identify that formalistic judgment draws on established formal 'known' rules or theory 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, professional judgement and decision making should follow a formalistic path whereas 'folk' or heuristic based judgement and decision making will follow a substantive path. In short, it is theoretically possible for practitioners to maintain a professional approach, even in naturalistic settings, *if* they maintain a formalistic approach to their analytical and/or rule based judgements and DM.

Theoretical View	Summarised Description of What Happens		
Common Perception	Plan/Review	Do	
Dual Processing (Kahneman, 2003)	Type 2 Decision Making		Type 1 Decision Making
CDM, RPD (e.g., Kahneman & Klein, 2009)	CDM	Simple Match Intuition	
		Diagnose a situation and/or Evaluate a course of action	
Decision Modes (e.g., Yates & Tschirhart, 2006)	Analytic (Formalistic or Substantive)	Rule Based (Formalistic or Substantive)	Automatic/Intuitive
Reflective Practice (e.g., Schön, 1991)	Reflection On or For Action	Reflection In Action	

Table 1. A summary of the various decision making and judgement processes thought to be used in professional practice.

Reflecting these assertions, the present study 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:

1. What approaches to DM do coaches take when presented with a contextualised real world coaching problem?
   a. What knowledge source do they draw on?
2. How do coaches respond when placed in a position of uncertainty?
   a. What knowledge source do they draw on?
3. What conclusions can be drawn regarding the identification, measurement and evaluation of coaching practice?

METHODS

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.

Procedures
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 8.05. 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.

All participants received the information pack at least five days in advance. They were then interviewed in a single data collection session (lasting between 45 and 70 minutes) covering two stages. Under the first, participants were asked to describe:
- Their evaluations of the athlete's strengths and weaknesses
- Their main aims for his immediate future development
- Some exemplar activities which they would employ

Participants were also asked to present a rationale justifying their decisions.

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. Data from both participants was consequently removed from the investigation.

Data analysis and member checking

Data were transcribed and analysed using inductive analysis (Côté, Salmela, Baria, & Russell, 1993) by a highly qualified athletics coach and experienced coach educator who was familiar with the sport and the event. Drawing on this inductive analysis a *knowledge audit* (this looks to capture key aspects of expertise) was completed creating a *cognitive demands table* (a means of synthesising data) (Gore & McAndrew, 2009). Finally, the responses and decisions from the coaches initial responses were deductively aligned against the approaches identified in Table 1. Additionally, the resonses from the second stage of the interview were deductively aligned against the RAWF model.

RESULTS AND DISCUSSION

Against the purposes of the investigation, results are presented focused on the perceptions, intended actions and reasoning reported within a cognitive demands table previously identified. Results from the participants who completed the whole investigation are presented in Tables 2 and 3. In all cases, the primary reasons and actions reported by a representative sample of 5 participants[2] coach are presented. Aligned with these responses, a deductive view on the approaches to problem solving and decision making 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 2 display a personally orientated substantive approach. Our deductive alignment of responses to substantive as opposed to formalistic 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. Perceptions on strengths, weaknesses, and planned actions, reflected the initial snap diagnosis made with an expected response being the coaches' evaluation. There was some similarity between the coaches, resulting in some level of clustering, i.e. those who thought the problems experienced by the athlete were technical whereas others thought the problem was one of strength and conditioning. However, the results in Table 2 are probably more defined by their apparent inter-individual variability depending on their initial diagnosis. In short, we suggest that responses were personally and substantively orientated, based almost exclusively on the coach's immediate intuitive perceptions and application of athletic folk heuristics.

Interestingly, when pressured by the manipulations 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 (see Table 3). 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 an detailed view on key components of the long jump and the role of focusing on the take-off (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, as coach 2 said, "I'll need to take a longer slower look at the key parts of the event". (Coach 2, Table 3)

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

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[2] Simply a space saving measure, all results can be made available

right track" (Coach 3, Table 3) "I would want to get some external views on this…some filming and analysis, some other opinions" (Coach 5, table 3)

Coach	Perceived athlete profile	Rationale	Aims and actions	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….pure 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

Table 2. Summary of the key cognitions of five 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	Perceived athlete profile	Rationale	Aims and actions	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	"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

Coach	Perceived athlete profile	Rationale	Aims and actions	Rationale	Deductively Aligned DM Approach and Method of Coping With Uncertainty
	right angles and so on."				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

Table 3 Summary of the key cognitions of five of the ten participants relating to their response to the secondary stimulus when uncertainty 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 asked become available.

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

Evidence presented here is that the coaches' initial problem solving and decision making followed a naturalistic recognition primed 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 created a view on how what the intervention should be. In short, there is 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.

From a knowledge source perspective however, the coaches seemed to have relied on substantive problem solving heuristics to offer a view on what they were perceiving. As mentioned 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 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.

- *How do coaches respond when placed in position of uncertainty?*
- *What knowledge source do they 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 . Initially there was strong consensus that there was a need to examine what was going on at the take off board. Some coaches coaches shared a view that "That's what all the books talk about" (Coach 3, Table 2) and 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. 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), there is an attempt to diagnose the problem (stage 2) and to evaluate a course of action (stage 3). This explanation is consistent with Klein's view that the 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 wish to explore options available to them and are 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). In short, this approach to solving the presented problem became more professional as deifned by Carr (1999). The conclusion being that in order to promote 'more professional' approaches to coaching deliberately placing coaches in positions of uncertaintly during their education will be crucial for their development. As such, at least with these coaches, it is possible to maintain a professional stance while engaging in RPD. However using this approach was dependent on being placed in a position of uncertainty.

- *Are there any conclusions that can be drawn regarding the definition, 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 ideas included in Table 1. 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, Burke, Martindale, & Cruickshank, 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. As such, evaluation must seek to check the quality of knowledge being used whether it is for full analytical DM or with RPD situations. 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).

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