**Para-Adventure: A Hyper-Dynamic Problem for the Inclusive Coach**

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**Para-Adventure: A Hyper-Dynamic Problem for the Inclusive Coach**

Recent research has recognized sports coaching as complex, chaotic, and cognitively taxing for coaches. Against this backdrop, the present paper explores challenges faced by high-level coaches working with disabled performers. Specifically, it seeks to understand how coaches create mental models of performance in adventure sports and para-canoe. Five coaches were purposively sampled and underwent a semi-structured interview. A thematic analysis revealed *conceptualizing the mental model* as being mechanically-related for all and as including a social construction within the para-canoe coaches. *Reflection* on the coaching process and on personal characteristics were perceived as important to individualized inclusive coaching. Coach training should particularly emphasize the need for critical judgment and decision making skills within a similarly oriented social structure of coaches and support staff where applicable.

Keywords: adaptive coaching; adventure sports; disability; inclusivity; paralympic sport; para-canoe

## Introduction

In recent years disability sport has become a growing element within the broad aim of greater social inclusion (Sport England 2017, European Comission 2011). Two aspects of inclusion that are pertinent to the scope of this paper are the Paralympic movement and inclusive practice in adventure sports. The Paralympics in particular has emerged as the second largest global sporting event (Leprêtre et al. 2016, Purdue and Howe 2012) with 176 countries competing in the Rio 2016 games. Additionally, inclusive adventure has become an aspect of adventure sports coaching practice (Paul 2010). If the goals of inclusion within these contexts are to be sustained, however, it is important to understand how systems, structures, and the stakeholders involved function to deliver a proficient service. Indeed, such evaluations offer the opportunity to assess and address issues such as workforce skills, efficiency, and attitudes, whilst concurrently providing insight into human psychology under novel constraints. Specifically, this novelty arises partly from the reality of personnel transferring their services from other traditional sport coaching practices. Nowhere is a need for *flexibility* and *adaptability* more apparent than within the already complex job of the coach. For some experienced coaches, at least, working with disabled participants is a highly novel situation (Taylor et al. 2015). Accordingly, there is a need to understand and conceptualize the nature and management of challenges faced by coaches working with disabled participants.

As identified by previous studies (Cotterill and Discombe 2016, Harvey, Lyle, and Muir 2015), the acquisition and implementation of expert practice within dynamic, sometimes even hyper-dynamic, environments relies on the coach's ability to create diverse knowledge representations, or *mental models*, that aim to satisfy performer's needs. In constructing a mental model, coaches will seek to understand important kinematic and biomechanical patterns which must be personalized for that individual based on a more

generic *technical template*. Consequently, these mental models inform the coaching decisions and actions required (Belling, Suss, and Ward 2015, Collins and Collins 2016b, Collins, Carson, and Collins 2016). High coaching efficacy would, therefore, result in a greater ability to create different mental models according to the various performer characteristics, and so manging this complexity should be recognized as a hallmark of expert practice (Hatano and Inagaki 1986). Frequent activation of these mental models—or at least of the most important factors for performance—increases their establishment within long-term memory (Carson and Collins 2016). As such, a more vivid, robust, and accessible mental model of performance is available, making knowledge retrieval of these aspects faster, more consistent and efficient (Zhou et al. 2018). In practical terms, this is demonstrated by the experienced coaches knowing what they should, or at least *think* they should, be attending to.

However, what has not yet been addressed are the challenges and processes undertaken when a coach with an already existing and well-established mental model for performance (no matter how diverse it is) must adapt outside of these parameters to generate a new mental model which optimizes the technical requirements for a performer. As an example, coaches working in Paralympic or inclusive adventure sport are often able-bodied themselves, highly experienced coaches of able-bodied performers who have “transferred” into this domain without experience of creating clear mental models to cater for the diverse aspects of performers who may have a disability (Taylor et al. 2015). Indeed, this is either because suitably diverse technical templates do not exist for such performers, none have been derived due to the hyper-dynamic nature of the environment, or a combination of both. This may be further limited by a pedagogic shortfall resulting from a lack of education and training. Accordingly, it is important that these processes are sufficiently addressed within the coaches’ current training experiences, influences, and consequently, this may then assist

in coaches' ability to effectively address performer needs, create knowledge, adapt technical templates into new mental models, and allow effective and inclusive participation.

By focusing on these implications, this paper adopts the perspective that performance development *should* be driven by the functional ability of the performer (Paul 2010). We suggest that the need for adaptability and flexibility to achieve this lies at the heart of good coaching and particularly inclusive coaching. Consequently, in an effort to stimulate research in this area, this paper addresses the nature of challenges faced by coaches within two related professional contexts, adventure sport and para-canoe, working with disabled performers, specifically in terms of how the technical templates might be adapted and understood, forming a bespoke mental model for a given performer. For clarity, we have examined the practice of paddle-sport coaches working in complex environments and with disabled performers; that is, those with "physical or mental impairments which have a substantial and long-term adverse effect on their abilities to undertake day-to-day activities" (Disability Discrimination Act 1995). Accordingly, in attempting to develop the paucity of information within adventure and disability sport, this study has deliberately sought out coaches working in areas in which the use of already existing and appropriate mental models are, at best, nebulous, requiring the coach to further adapt components for performance development. Within other Paralympic sports, for instance jumping (Nolan and Patritti 2008, Nolan, Patritti, and Simpson 2006), seated throwing (Frossard et al. 2007, Frossard, Stolp, and Andrews 2004), running (Ferro, Graupera, and Vera 2002), and wheelchair propulsion (Costa et al. 2009, Goosey and Campbell 1998), research to inform technical templates is much further advanced, making study of the chosen domain particularly interesting. Initially, however, we provide clarification as to both the coaches' role and the working context.

***What is an Adventure Sports Coach?***

The adventure sport coaches' role has emerged in response to increased demand for performance development in adventure sport. Collins and Collins (2012) conceptualized adventure sports coaching as an interacting subgroup of traditional coaching practice and outdoor education. Supported by a clear epistemology, adventure sport coaches synergize shared skills across outdoor education, leadership, and coaching, catering for a range of different services, including: performance development, personal development, and experience development (see Collins and Collins 2016b). With a frequent focus on individualized development (e.g., motoric, cognitive, experiential, and psychological), their aim is to enable *independent* participation in adventure sport, or in adventurous contexts. In doing so, progress is often governed by the participants themselves rather than benchmarks set by high-level performance per se (i.e., the goal of greater adventure rather than faster, stronger, further, higher, etc. outcomes; Jones and Wallace 2005). Accordingly, the adventure sports coach has a broad role in utilizing adventure for social gains, and in doing so has encompassed disability sport. Such an approach when working with performers who have a disability extends the personal construct of adventure and supports the development of independence in the performer.

Finally, because adventure sport coaching practice encompasses a multiplicity of combined roles and diversity of function, there is high demand to exercise effective management of not only oneself but also of the performer(s) (Collins and Collins 2013, 2016a). The adventure sports coaches draw on a wide combination of skills, such as risk management, risk–benefit exploitation, personal ability, pedagogic skills, leadership skills, domain-specific declarative knowledge, and technical skill in order to fulfil their complex and challenging role.

***What is a Para-Canoe Coach?***

Evolving from Olympic canoe sprint disciplines, para-canoe is a recent evolution within paddle-sport, debuting in the Rio 2016 Paralympic games. Para-canoe coaches therefore, by necessity (at least initially), have transferred from Olympic canoe disciplines directly into para-sport (Taylor et al. 2015). Para-canoe athletes compete in one of three classifications depending on their level of function (International Canoe Federation 2016), with the ultimate outcome of achieving global success and winning gold medals. Like the adventure sports coaches, the para-canoe coaches focus on individualized development (e.g., motoric, cognitive, experiential, and psychological). However, a key distinction between the two is the nature of support provided. From the para-canoe coaches' perspective, outcomes should result in skillful, effective, and interdependent high-level performance; as is the norm within Olympic sports.

Para-canoe coaches' practice also requires a multiplicity of roles and diversity of functions, which too creates high cognitive demand within the coaching process (Kaya 2014). Working with aspiring and current Paralympic athletes, the para-canoe coaches draw on a breadth of skills such as pedagogic, leadership, domain-specific declarative knowledge, and technical skill. Additionally, the para-canoe coaches have a range of support personnel available and may have to manage an integrated support team (medicine, sport science, psychologists, etc.) in order to fulfil their likewise complex and challenging role within the performance environment. From this perspective, it is important that the mental model of performance is shared amongst the community of practice, which adds to the operational difficulty involved.

In summary, both the adventure sport and the para-canoe coaches share common and complex practical challenges, which, we contend, place a high emphasis on the cognitive load to manage the coaching process. However, the adventure sports coaches' situation is somewhat unique, in that the added environmental diversity serves to compound this issue

even further (Abraham, Collins, and Martindale 2006, Rynne and Mallett 2012, Miller and Rollnick 2012, Collins and Collins 2016b). Taking these factors together, therefore, what seems to be crucial for success is the coach's ability to either adapt an existing mental model for performance or generate a novel one where none currently exists (Carson and Collins 2011). Accordingly, we will now examine in greater depth the cognitive mechanisms that could assist the coach to operate under such circumstances, at least as understood by current literature.

***Managing the Complexity: Professional Judgement and Decision Making***

Martindale and Collins (2005, 2007) and Abraham and Collins (2011) originally conceptualized the professional judgement and decision making (PJDM) approach as a synergy of nested decision making over short-, medium-, and long-term timescales to achieve a predefined set of intended, and individualized, outcomes. In outdoor activities, Collins and colleagues (e.g., Collins, Collins, and Carson 2016, Collins, Collins, and Willmott 2016, Collins, Carson, and Collins 2016, Collins and Collins 2015, 2016a, b) conceive PJDM as a graded continuum in which the interaction of logical linear "slower" processes and "faster" naturalistic processes (Kahneman 2011) are differentially integrated, depending on the nature and context of the decision to be made (Cotterill and Discombe 2016, Harvey, Lyle, and Muir 2015). Practically, PJDM is developed and deployed through in-action, on-action, and on-action/in-context reflections, which are underpinned by a metacognitive ability (Collins, Carson, and Collins 2016). Adaptability and flexibility is facilitated by generating, contextualizing, critically considering, and managing alternative options throughout the process. A focus that is driven by a need to address technical, biomechanical, or pedagogic principles in an individualized way. Thus, the success of a PJDM framework relies on an understanding of a context's situational demands (Abraham and Collins 2011) which

combines situational awareness (Flin, O'Connor, and Crichton 2008) and a comprehension of the contextual framework (Ayal et al. 2015, Collins, Carson, and Collins 2016).

By necessity, but also frequently by design, the resulting coaching process is flexible and adaptive through the continuously dynamic blend of environmental, individual, and task constraints (Newell 1986), which are manipulated to optimize performers' experience and development. Based on informed observations and questioning, the coach compares the technique of the performer against an intended mental model which is a constructed projection of that movement for each individual (Giblin et al. 2015, Ferdinands 2010, Knudson and Morrison 2002). The myriad of possibilities, evolving from the many possible interactions of constraints, drive the need for adaptability, flexibility, and creativity in the coaching process.

In the present case, however, there are a number of potential challenges to the effective deployment of good judgement and decision making skill. For instance, the important information needing attention to create an appropriate mental model maybe unclear to the coach, or difficult to decipher. Consequently, this leads to potential miscalibration on what goals to agree and training environment to select in order to bring the mental model into fruition. Another might be the reliance on information passed down from others' previous experience, including technical templates employed, where this is now invalid due to changes in regulations, technological advances etcetera (Carson and Collins 2011, Chow and Knudson 2011) or even societal norms in the treatment of minority populations (Bourdieu 1984). From an educational perspective, there may be a lack of formalized resources to aid coaches in creating, or identifying, the declarative knowledge needing to be adapted for performers (Taylor, Werthner, and Culver 2014). Equally is a lack of training in the skills that allow the coach to derive that knowledge from their own experience (Taylor, Werthner, and Culver 2014, Taylor et al. 2015), which in turn potentially limits the coaches ability to optimize their

actions by being adaptive and flexible. While these challenges could ultimately lead to suboptimal coaching practice, there is also potential that fear of action, or non-action, may be equally as counterproductive (McDonnell, Hume, and Nolte 2013, Paul 2010). For the moment, however, it would be useful to explore these possibilities in greater detail.

Therefore, in this early-stage investigation we ask the following questions: (a) what is the nature of the challenges faced by para-canoe and adventure sports coaches working in complex environments with performers who have a disability? and, (b) how might the mental model for performance be derived?

## Method

### Participants

Participants were five British paddle-sport coaches from both adventure sport ($n$ = 2 ; $M_{age}$ = 37 years ± 5) and Para-sport ($n$ = 3; $M_{age}$ = 43.3 years ± 9) domains. No disability or para-canoe specific qualification is available from the National Governing Body (British Canoeing), therefore all participants were qualified within able bodied paddle-sport disciplines although currently working in disability/para-sport. To ensure a sufficient level of domain expertise, experience, and inherent quality in terms of participants' self-reflective ability, purposive sampling was employed based on the following criteria: (1) a minimum of 5 years' coaching experience since senior accreditation within paddle-sport (adventure sport coaches; $M$ = 10 years, para-canoe coaches; $M$ = 15 years), (2) currently working within disability paddle-sport with internationally-competitive and/or higher (e.g., professional/premiership) performers and/or hold the highest level of comparable coaching qualification within their respective sport, and (3) have a willingness to discuss their professional practice. Coaches where deliberately chosen due to the complex nature of their roles and the environments in which they worked with disabled performers. A summary of participating coaches and their experience can be found in Table 1.

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

At the current stage of investigation, the authors acknowledge the potential limitations associated with such a small sample size; however, this is as a direct result of there being limited coaching roles currently within para and inclusive paddle-sport. The coaches were recruited through personal contact with the research team; the corresponding and second author here being qualified and active practitioners within these two respective high-level sporting domains. This study was carried out with the approval of the university's ethics committee and informed consent from all participants was provided prior to data collection, in accordance with the Declaration of Helsinki.

**Procedure**

Reflecting the high status of participants, a deliberately open, semi-structured qualitative approach was utilized to encourage a breadth and richness of interview response. Specifically, semi-structured interviews were conducted with each coach in a quiet, private location, and at a time convenient to them. Participants received an information sheet by email at least 1 week prior to interview and, after consenting, the interview commenced by flexibly covering the lines of questioning shown in Table 2. In brief, the interview guide asked participants to recall and evaluate coaching episodes. Probes were deployed where necessary to gain additional information relating to interesting/important responses, to check ideas against emerging literature and concepts, and to encourage participants to recall and evaluate coaching episodes as broadly as possible, thus ensuring sufficient depth of response across all participants. In designing the questions, we were informed and guided by the work of Crandall and Getchell-Reiter (1993), whose application of the critical decision method to nursing incidents in critical care offered a strong template to exploring professional contexts

223 requiring similar adaptive characteristics. Furthermore, this approach has been utilized in
224 similar studies of adventure sports coaches (Collins, Collins, and Carson 2016). The
225 decision-making process and the challenges were explored more generally, as too were the
226 underpinning philosophies of the coach, their perceived skills and attributes.
227
228 ****Table 2 near here****
229
230 The second author conducted the interviews and initial analysis of transcripts. As
231 someone who is highly experienced in this particular field—holding Level 5 British Canoe
232 Union coaching awards in two disciplines, the UKCC Level 4 Certificate in paddle-sport,
233 International Para-Canoe Classifier status, and having attended European, World, and
234 Paralympic Games in support of Para-canoe, the researcher was able to question, probe, and
235 interpret responses with a degree of authority. The first researcher has 30 years of experience
236 as an adventure sports coach at National Centers within the United Kingdom, is a coach
237 educator, and holds Level 5 British Canoe Union coaching awards in four disciplines. The
238 third author is an Advanced PGA Professional golf coach and BASES Sport and Exercise
239 Scientist, and also has a high degree of understanding of performance environments. Overall,
240 interviews lasted between 35–45 mins. Data were recorded using a Dictaphone and securely
241 stored electronically in mp3 file format.
242 **Data Processing and Analysis**
243 Following the guidance provided by Aronson (1995) and Braun and Clarke (2006),
244 data were analyzed using a thematic analysis. Accordingly, interviews were first transcribed
245 verbatim, read, checked and corrected against the recorded interview, and then each
246 transcription was actively re-read several times prior to fully apprehending the essential
247 features (Sandelowski 1995) to assist in a more complete analysis. General impressions of

these data were written in note form and shared between the two researchers conducting the analysis (first and second authors), highlighting any similarities and differences. Secondly, driven by an analytic interest in the complexity of the processes, initial coding of response data was applied to each transcript; thus, formally identifying relevant and similar extracts. Thirdly, data codes were collated into hierarchically-ordered themes based on relationships and common features. Within a fourth phase of analysis, these themes were subjected to review and further refinement. A meeting was held between the two researchers to discuss and compare the analysis. The principal aim was to check for a shared understanding and interpretation of data and, therefore, the emerging themes as a whole dataset. This process enabled themes to be combined and broken down, as well as the identification of new themes. Importantly, the emergence of themes at any point during the analysis did not depend on the prevalence of a code, but rather, on what the theme revealed about the complexity of the observation process. Finally, again as a co-operative process, the three researchers defined themes according to the essence of data codes within and how these might be perceived in relation to other existing themes.

In addition to the steps outlined above to ensure inter-coder agreement, the question of trustworthiness was addressed through use of an independent researcher (third author), who was not involved in the interviewing or initial coding process, independently coding a random sample of the transcripts (80%) to guard against mis-interpretation and researcher subjectivity (Morrow 2005). Indeed, this was seen as particularly important due to the study's inherently low sample size. Data were coded against the pre-agreed themes and assessed for the level of agreement. Any disagreements regarding these differences in codes were discussed until a consensus was reached.

## Results and Discussion

In attempting to explore the nature of challenges faced and how the mental models are derived, analysis identified 499 raw data codes which were organized into 13 lower-order themes. Lower-order themes were subsequently grouped into four mid-order themes. These were collated into 2 higher-order themes as identified in Table 3. We have provided frequencies of lower-order themes discussed by each coach and have used quotes in the discussion to demonstrate the depth and richness found within these data. For clarity and confidentiality, coaches are identified numerically (para-canoe coaches as 1–3 and adventure sports coaches as 4–5). Higher-order themes are now presented and considered as reflecting the structure in Table 3.

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

**Conceptualizing the Mental Model**

In conceptualizing a mental model, it is perhaps unsurprising that coaches discussed the task of realizing the desired mechanics involved. Notably, coaches emphasized that they wanted to maintain the same outcomes with disabled performers when compared to their previous experiences coaching able-bodied performers. As the following quotes explain:

> Within para you are still looking for the same things. I want to make the connection, lock the blade, move the boat past the blade as best I can. OK, this is what it looks like for an able-bodied paddler, if I take out their legs this is what they do. (Coach 3)

> You kind of learn the rules that apply [from able to disabled], you are looking at minimizing dampening and maximizing connectivity as a rule. That's quite easy to measure. (Coach 5)

Despite the outcomes being similar, the need for innovation on the coach's behalf was apparent. Coach 5 described how consideration of a performer's disability led to the use of modified equipment as a means of minimizing the demand on the performer:

> I dealt with a participant last year who expressed she had physical difficulties. My initial thoughts were 'let's try and get the boat more stable and easier to paddle and something that maybe wouldn't be as much of an issue if it capsized' for example. That led me towards sit on tops[1], certainly something I hadn't done previously to that, understanding how kit needs to be adapted potentially is important.

However, the extent of innovation differed depending on the nature of the performer's disability. Consequently, mental models were easier to construct for some than others, as Coach 1 explains:

> Understanding the functional limitations of the athlete. Then striving towards minimum dampening and maximum connectivity are the first two rules I would have. I believe that actually the able-bodied model is pretty close for KL3 and KL2. For the KL1[2] athlete, it's quite a bit different, as soon as you take the rotation out the whole stroke dynamic becomes quite a bit different.

Coaches typically began with able-bodied technical templates in mind when working with disabled performers. However, as the following account from Coach 1 reveals, efficiency trade-offs were sometimes an accepted part of the decision making process:

[1] A sit on-top is a variant of kayak with a flat hull and open deck that allows ease of access and stability with the paddler literally 'sitting on top' of the kayak. Additionally, sit on-tops are affordable, durable, and allow multiple configurations including seating positions.

[2] Denotes level of function within para-canoe kayak classification. KL1: Athletes with no or very limited trunk function and no leg function and typically need a special seat with high backrest in the kayak. KL2: Athletes with partial trunk and leg function, able to sit upright in the kayak but might need a special backrest, limited leg movement during paddling. KL3: Athletes with trunk function and partial leg function, able to sit with trunk in forward flexed position in the kayak and able to use at least one leg/prosthesis.

> I coach a slightly different technical model for the pair of them. [Athlete X] can't use leg drive but is completely balanced left-to-right. I can lock her down at her hip and she has full function above that point. So she's like a slalom technical model to some extent. Whereas [Athlete Y] has also got complications around his core so the whole chain is imbalanced from left-to-right, I use the able-bodied model as it's the same kind of full use of leg drive, full use of everything but I know that some things aren't going to get to the gold standard of the technical model.

Whether similar to their previous coaching experiences or not, there was general acceptance that "good coaching" needed to focus on the *individual*, as Coach 2 exemplified when saying: "I think you're aware of the [person's] disability but you are coaching the person. You understand how the disability is possibly affecting them but you are coaching the person". Or as Coach 1 put it, "I have worked with a lot of different athletes with disabilities, they are all different even if they look like they have the same disability".

As well as understanding the mental model themselves, para-canoe coaches identified the beneficial input provided by their support team colleagues in shaping such a vision. Thus establishing a *shared mental model* of performance. Primarily, these coaches reported consulting on the physical aspects of the performance, either technical or regarding strength and conditioning. For instance, Coach 3 described how involving the team with athlete at this stage could inform the technical developments that were desired:

> With some of the guys [athletes] I've worked with I'd have the whole team in there [physio, sport scientists, etc.], or part of the team along with me and the athlete, and then between us if there was something I was looking for technically or tactically or physically from the athlete. Then working with them to see me giving them an understanding of what I want from a technical point of view.

Coach 2 also expressed that working together alongside the athlete was highly performance-focussed:

> You know it gives you a framework and it's then working out what's applicable, what's not, what could change in that framework? What's going to work for that individual? I think it comes back to that team of people including the athlete in that team as well, what's going to work for them so that they can maximize their performance.

Reflecting attittudes in other high performance sports, Coach 3 expanded his earlier comment by going one step further, he utilized the support team to know how much he could challenge the athlete during their technical development, as he explained:

> Maybe challenge that [performance outcome] and get a little bit further than that based on what I have seen or what I know [technical template observation], because I have spoken to the strength and conditioning coach and physio and I know there is probably a little bit more there [physiologically] than what she [the athlete] thinks.

In contrast, however, the adventure sport coaches expressed a much more isolated, lonely experience of the process, as Coach 5 explains when reflecting back on a previous experience with a performer: "I'd have loved to have had more, to seek mentoring opportunities, don't try to do it all on your own, it was a painfully long process to gather it myself". Para-canoe Coach 3 empasized this difference by comparing his practice before having joined a para-canoe community: "I have been very isolated as a coach before being in that group, and the wider group in Nottingham it all makes you think!".

Based on these data the need for adaptability in coaching practice appears clear and consistent with previous studies documenting this feature as an important characteristic (e.g., in mountaineering; Collins et al. 2018). However, this did not mean that coaches were

unable to utilize knowledge already gained from coaching able-bodied performers; primarily due to the fact that not *every* movement within the mental model needed adapting. In fact, for some athletes coaches did not change much at all within the para-canoe setting. From a practical perspective, it is interesting to notice an important difference between para-canoe and adventure sport contexts in this regard and what implications this might have on each coach's scope of innovation. Take for example the sit on-tops employed by an adventure sport coach. More generally, equipment in para-canoe competitions will be regulated to meet classification requirements (ICF 2017) whereas, in adventure sport its use is dependent on safety and performer needs as judged to be necessary for development by the coach. As such, in a para-canoe context the coaching decisions in training may be more highly directed by constraints imposed during competition, whereas the innovation afforded in adventure sport can be much greater due to an omission of regulation governing equipment. In other words, while the technical templates were often adapted for the performer in para-canoe, it *can* be the case that the performer and their equipment are adapted to generate closer alignment with a more commonly employed technical template in adventure sport. In either case, however, adaptations were reportedly underpinned by individual performer differences. Such evidence is certainly supported by fundamental research suggesting the need for consideration of performer's predispositions and capabilities, accepting the individual as the unit of analysis when it comes to development beyond initial learning (Kostrubiec et al. 2012). Consequently, a narrower set of technical aspects become perhaps more anticipated with experience and accommodated by the coach while other, more universal principles of movement remain preferentially fixed in the coach's mental model.

Furthermore, the differing roles and contexts of para-canoe and adventure sport coaches did emerge as factors that may influence development of the mental model. Specifically, the para-canoe coaches operate in a collaborative community of practice that

encompassed the support staff for the althete (Stoszkowski and Collins 2014, Wenger and Snyder 2000). Consequently para-canoe coaches have a clear demand and need to establish a shared model and understanding across the support team (Collins and Hill 2016). Of course, not only must this model be shared, but also consistently promoted and applied (i.e., internalized and goverened) by each member once decided upon (cf. Cruickshank and Collins 2012, relating to program development for culture change). While there are clear benefits to having an extended network of expertise available, this too increases the potential risk for miscommunication, confusion, and frustration amongst members and, more importantly, the athlete. As such, the para-canoe coaches provide an explicit managerial role within the group when compared to adventure sport coaches (cf. Collins and Collins 2012), which represents a potential challenge for those transitioning into such environments. Involving the athlete in developing a mental model, common to both adventure sport and para-canoe coaches, is inherently sensible by the coach since they will be less able to empathize with the athlete in terms of executing the movement, or understanding the precise sensations being encoded by the performer (Lang 1979, Carson, Collins, and Jones 2014, Millar et al. 2017). In turn, this involvement would expectedly increase the level of buy-in, motivation, and commitment from the athlete (Butler and Hardy 1992) since the mental model will truly reflect a personally meaningful representation. Accordingly, and consistent across all coaching, this process of contemplation should be viewed as part of any technical intervention, even though no training "action" has been taken at this stage (Prochaska, DiClemente, and Norcross 1992).

An alternative, but possibly additional, interpretation, is that coaches in this context seek reassurance amongst their peers regarding good professional practice in this novel and less familiar context. This added social dimension of work with disabled athletes (see Paul 2010) primarily concerns weighing up options with peers to determine what actions are

within acceptable levels of risk. Indeed, this uncertainty may reflect the (relatively) early stage of coaching development in para-canoe and the very small number of adventure sport coaches working in this context. In conceptualizing the mental model as either an adventure sport or para-canoe coach, these recognizable PJDM processes reflect a distinct separation from normative behaviors within traditional coaching contexts, are more congruent with the expertise approach (vs. competency approach) advocated by Collins et al. (2015), and indicative towards effective deployment of informal socially constructed coach knowledge through critical discussion and being open-minded (Stoszkowski and Collins 2016).

**Reflection**

Crucial to creating these mental models for performance was the coaches' use of reflection both to the coaching process and to themselves (i.e., a meta-reflection). Taking a macro view towards their practice, coaches suggested the need for a more considered, deliberative approach in-action to adapt within this context, as Coach 4 suggests when looking back on many years of experience:

> If you had asked me that 10 years ago my process might have been 'let's, make a plan . . . and we'll do that as opposed to having to spend the first hour or maybe even up to half a day observing where they're at'. Previously I would have just been 'this is what we're doing' and just doing it without much thought, adapting, and changing, really. That's certainly evolved over time as well, I think my understanding of how long to observe for has adapted over time.

Coach 5 supported this view, elaborating on the novelty of the coaching context as being a reason for needing a more systematic approach:

> I would be a very holistic observer, I could quickly technical tactically pinpoint where I want to go based on my experiences. With things I am not so familiar with or not do

> as often, I definitely have a huge amount more systems I go through, I guess with the folks with the disability I probably go more systematic.

Despite participants' high coaching status, this did not mean that coaches were always successful in achieving their desired outcomes. In fact, previous errors were seen by Coach 5 as an important underpinning factor to enabling his ability to coach inclusively:

> I needed to have trial and errors. I needed to have got it wrong, to reflect on, I needed all those experiences. By having those experiences with different organisations and charities has informed the speed that I can get up and running, or how quickly I need to adapt.

Which was reiterated by Coach 1 in the following: "I'm fortunate to try things in para, I've been working in para since the start. I have 5 years' experience of trying stuff and it not working, trying different things."

Echoing similar approaches to constructing the mental model, Coach 1 discussed his pedagogic development, meaning that he is adaptable irrespective of the context:

> The biggest thing I do differently is in terms of the individualization, in terms of coaching isn't because of the disability. It's actually one of those athletes likes quite logical feedback and the others like emotional-supportive feedback. That's the biggest difference in how I coach the two, I think the disability is a minimal part of that.

As already identified, coaches reported changes to personal characteristics that were necessary for successful inclusive coaching. In order to problem solve well, Coach 2 explained that patience was required:

> Problem solving and searching wide and far with that problem solving. Patience, the two of them go hand in hand. You have to be willing to try anything and get your athlete to try anything. Encouraging them and supporting them.

Likewise, Coach 3 emphasised the need for patience, alongside other characteristics such as emotional intelligence:

> Probably para-coaching you have got to be a little bit more patient. You've got to be empathetic with where they are at, but not to the point where you don't then challenge them. You have to be, have the flexible approach, adaptable approach to sessions when you need to switch and change them, maybe try to be a little bit more innovative if necessary in how you deal with the injury. You've got to be very aware of how much you are pushing them. Whether they are going to break more easily or not.

Expanding on these qualities, Coach 3 explained how transitioning from an athlete to coach required him to think more critically in terms of coaching style, but also when conceptualizing the mental model: "'I was a single blade paddler, prior to that I was in kayak, so my technical templates have come from experience as an athlete"' and when prompted:

> I think I have become more and more aware of what I am, and how I operate and how I come across to people. More self-awareness, that you maybe think when I'm delivering that [technique], you need to switch that a bit for this person [with a disability], to flex that for individuals, not necessarily, before it was probably just one mode.

Presently, at least since their experiences of inclusive coaching, reflection was employed by these coaches across multiple levels of practice. At a micro level the immediate

issues identified via observation and questioning are paramatized, a solution planned (via group discussion), implemented, and, crucially, continually reflected upon. At a macro level the coaches fundamentally considered the suitability of their approach to coaching in this context. This metacognitive process of continual reflection is important to prevent decisions being made based on inappropriate heuristics for the task at hand (see Collins, Carson, and Collins 2016), which could lead to undesired outcomes. A willingness to adapt, trial and improve in response to the situational demands reflects aspects of emotional intelligence (Goleman 1996) and concepts of professionalism (Taylor and Garratt 2010) as well as elements of metacognitive capacity (Kruger and Dunning 1999). Put simply, these findings support the notion that coaching is nonlinear and complex, consequently, high-level coaching is cognitively taxing *and* the coaches know it!

In practice, reflection is integrated within the coaching process, in- and on-action when in-context (Collins and Collins 2016a) and as an explicit on-action process (Schön 1983). Whereas the para-canoe coaches supplemented this on-action process by utilzing the community of practice, adventure sport coaches relied on multiple cycles of reflection against their intended outcomes. Importantly, as coaches become better at reflecting on their practice, this process is suggestively more efficient in that the important elements of performance are more easily identifiable and thus the demand on cognition naturally declines.

## Conclusion

Adventure sports coaches and para-canoe coaches face complexity while working with performers who have a disability; creating a mental model of performance being one of many aspects. In addressing this need for a mental model, the coaches manage complexities by utilisng reflective skills in and on action. The reflective process is driven by a sophisticated set of epistemological values that utilize an asset driven model of the individual at the centre of the coaching process. Good coaching in this respect requires adaptability,

flexibility, innovation, and creativity, which was facilitated by a sophistcated judgements and decision process. While the para-canoe coaches utilzed and managed an extensive support network to allow this, adventure sport coaches lacked the established community of practice and relied on a cyle of experience with reflection and a belief in their own abilities. As such, from a sustainability perspective, training coaching to work within inclusive coaching should particularly emphasize the need for critical judgment and decision making skills within a similarly oriented social structure of coaches and support staff where available.

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734

735 Table 1. *Coach experience and qualification*

| Coach | Highest Qualification | Coaching Experience (Years) |
|---|---|---|
| 1 | British Canoeing Level 4 | 20 |
| 2 | UKCC Level 3 Certificate.<br>Great Britain Paralympic Programme | 10 |
| 3 | UKCC Level 3 Certificate.<br>Great Britain Paralympic Programme | 23 |
| 4 | UKCC Level 4 Certificate in Paddle-Sport<br>British Canoeing Level 5 | 22 |
| 5 | British Canoeing Level 4 | 10 |

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737 Table 3. *Structure of the Thematic Analysis*

| Higher-order Theme | Mid-order Theme | Lower-order Theme | Coach 1 | Coach 2 | Coach 3 | Coach 4 | Coach 5 |
|---|---|---|---|---|---|---|---|
| Conceptualizing the mental model | Mechanical features | Individualization | 11 | 6 | 16 | 7 | 7 |
| | | Innovation of technical template | 15 | 15 | 11 | 2 | 2 |
| | Sharing the mental model | Performance focus development | 3 | 2 | 16 | 2 | – |
| | | Community of practice | 1 | 3 | 15 | – | 3 |
| | | Discuss ideas with athlete/performer | 15 | 9 | 13 | 3 | 6 |
| Reflection | Coaching process | Learning from coaching experience | 12 | 13 | 17 | 8 | 27 |
| | | Generating/considering options systematically | 20 | 26 | 27 | 5 | 18 |
| | | Integration of reflection as part of practice | 5 | 3 | 4 | 2 | – |
| | | Broader and adaptive coaching repertoire | 5 | 16 | 19 | 4 | 15 |
| | | Learning focussed environment | 13 | 3 | 10 | 9 | 7 |
| | Personal characteristics | Critical thinking | 1 | 1 | 1 | 1 | 3 |
| | | Patience | – | 3 | 1 | 2 | – |
| | | Emotional intelligence | 5 | 1 | 7 | 1 | 1 |

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