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Understanding the "gut instinct" of expert coaches during talent identification

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ABSTRACT

Coaches are an integral part of talent identification in sport and are often used as the "gold standard" against which scientific methods of talent identification are compared. However, their decision-making during this process is not well understood. In this article, we use an ecological approach to explore talent identification in combat sports. We interviewed twenty-four expert, international-level coaches from the Olympic disciplines of boxing, judo, and taekwondo (age: 48.7 ± 7.5 years; experience: 20.8 ± 8.3 years). Findings indicated that when coaches identify talent they rely on "gut instinct": intuitive judgements made without conscious thought, used to direct attention to particular athletes or characteristics. Our analysis revealed four major contributors to coaches' intuition: experiential knowledge, temporal factors, seeing athletes in context, and what can be worked with. Our findings demonstrate that i) athlete selections may be influenced by the coaches' perceived ability to improve certain athletes (rather than solely on athlete ability); and ii) "instinctual" decisions are the result of years of experience, time spent with the athlete, and the context surrounding the decision. Based on these findings, we recommend that future research focuses on the duration and conditions that are required for coaches to confidently and reliably identify talented athletes.

Despite ongoing debates within sporting contexts related to "talent" (Baker et al., 2019) and whether it can or should be "identified" (Baker et al., 2018), the concept of talent remains a key area of interest for both academics and practitioners. Identifying performers who will succeed in the future at the elite level in a given activity has spurred considerable research interest (Johnston et al., 2018; Vaeyens et al., 2008). Many examples of physical, physiological, and/or psychological testing to predict which performer/s will be successful later in life exist within both sport and the literature (Johnston et al., 2018). These methods have often used subjective expert knowledge (read: coach knowledge) and/or opinions as the "gold standard" against which their effectiveness is measured (Roberts et al., 2019), despite questions about the validity of coach selections (Johansson & Fahlén, 2017).

Coaches are an integral part of talent identification (TID), yet empirical understanding of how they "*make the right decision at the right time*" is lacking (Lyle & Vergeer, 2013). Expert intuition and decision-making has been investigated in many fields including sport (Araújo et al., 2005; MacMahon et al., 2019; Murray et al., 2018), management (Highhouse, 2008), medicine and nursing (Cheung et al., 2018; Rosciano et al., 2016), military and police (Bakken & Gilljam, 2003; Brown & Daus, 2015), and education (Crisp, 2010). While it is known that expert decision-makers use the available contextual information, content knowledge, and experiences to predict outcomes (Hertwig et al., 2004; Weber & Johnson, 2009), it is still unknown what information and knowledge are critical in this decision-making process; especially in a context where, due to the extended timelines involved, the right decision may not be easily evident.

Intuition and decision-making – An ecological perspective

Coaches rely on their "gut instinct" in many aspects of coaching (Collins et al., 2016; Lyle & Cushion, 2017; Lyle & Vergeer, 2013; Roberts et al., 2019). Coaching intuition is often linked with quick reaction time (i.e. instinctive decisions made during game-play) but also plays a significant role in judgements and decisions made in other complex coaching situations. Decision-making is considered "complex" when there is uncertainty, limited information available, inter-relatedness between the decision-maker and the outcome, emotional and ethical challenges, and/or time pressures associated with making the decision (Anderson et al., 2019); all factors typically experienced by coaches, particularly during talent identification.

Decision-making has been a topic of investigation for over fifty years (Edwards, 1954; Raab et al., 2019), and in this time there have been a number of "theoretical streams" (p. 26) used to conceptualize the process within sport (Raab et al., 2019). Raab et. al (2019) describe these "streams" as the cognitive, ecological, economic, and social judgement approaches. We have chosen to apply the ecological approach to this research due to the dynamic context in which sport decisions are made. An ecological approach to decision making understands that decisions are made based on the most "attractive" option within a specified context (Araújo et al., 2006) and therefore

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the "right" decision may change with circumstances. Decisions and judgements are shaped by the interaction of the individual (the coach) and their environment, thus affecting their perceptions, actions, and cognitions (Araújo et al., 2017; Renshaw et al., 2010).

Ecological dynamics emphasises how the characteristics of an individual performer (in the case of TID, the coach), the environment of the performance and the goals of the task (Davids et al., 2008; Newell, 1986) combine to shape their behaviour through affordances (Gibson, 1979). Within this framework, decisions are considered to be emergent – based on the affordances present at the given time for a given individual (Araújo et al., 2017). Ecological approaches to decision-making have previously been associated with the decision-making of athletes (Araújo et al., 2015; Barsingerhorn et al., 2013; Vilar et al., 2013) and, more recently, referees (Russell et al., 2019), and the same principles can be applied to the decision-making process of coaches when identifying talent.

Much of the existing research into coach decision-making labels non-deliberative coach cognitions as "intuitive" (Christensen, 2009; Collins et al., 2016; Day, 2016, Giske et al., 2013, Trottier, 2016), "instinctual" (Fiander et al., 2013; Gines, 2017, Lund & Söderström, 2011; Thelwell et al., 2008), or "tacit" (Christensen, 2009; Nash & Collins, 2006) and "difficult to articulate" (Collins et al., 2016), among other terms, with little attempt to understand the experiences and knowledge used to make these intuitive yet clearly informed decisions. Nash and Collins (2006) argued that "seemingly instinctive" (p. 470) decisions made by expert coaches are a result of the dynamic and complex interaction between types of knowledge (tacit and declarative) and memories built from experience and reflection. However, it is unknown how this applies within TID, and to what extent each of these components (tacit knowledge, declarative knowledge, experience, reflection) affect TID.

This study uses the Olympic sports of boxing, judo, and taekwondo to examine *why* TID judgements and decisions are made the way they are – that is, what information is used to underpin these decisions and how is it used. These sports represent a significant portion of the medal opportunities at each Olympic Games and in 2020, there will be 144 medals to be won across boxing, judo, and taekwondo, making up approximately 15% of the medals available (The Tokyo Organising Committee of the Olympic and Paralympic Games. !, 2017). Despite this, there are few studies which have explored TID in combat sports (c.f. soccer research; see Sarmento et al., 2018). This study will use the concepts of ecological dynamics to discuss the process of coach decision-making. Specifically, the following question was addressed: How do coaches identify those athletes with the greatest potential for future success?

Methodology and methods

A qualitative descriptive design (Sandelowski, 2000; Stanley, 2014) was used to explore the ways in which coaches identify talented athletes. The lead author, an applied sport scientist with over 10 years of coaching experience, conceptualised the study, conducted all interviews and performed the initial levels of analysis. The lead author has limited experience with the sports examined in this research, however, used their coaching and sport science background to establish rapport with coaches. Approval from the University's Human Research Ethics Committee was obtained prior to participant recruitment.

Participants

Coaches were purposively sampled from the contacts of three authors, followed by snowball sampling (Patton, 2015) in order to recruit a total of 24 (2 female, 22 male) elite-level, expert coaches (8 coaches each from boxing, judo and taekwondo). Coaches had between 10 and 35 years of coaching experience (20.88 ± 8.31 years) and were approached for inclusion if they were classified as "expert". The criteria to be classified as "expert" were based on combined criteria from Christensen (2009), Olusoga et al. (2010), Côté and Gilbert (2009), and Martindale, Collins and Abraham (2007); specifically: had a minimum of ten years' coaching experience; held the highest coaching certification available in their country; were employed as a national coach for their governing body or as a coach educator for the international sporting body; and had coached at one or more senior benchmark events (e.g., Olympic Games, World Championships). Additionally, all participants were required to speak English. Coaches were contacted via email or phone and asked to participate in the study, and all provided written and verbal consent on the understanding that their information would be de-identified as much as possible. To that end, coaches have been coded numerically.

Data collection

Interviews were conducted at a time and location convenient to each coach. Semi-structured interviews were used to explore the coaches' judgement and decision-making process while identifying talent. An interview guide was developed by AHR and DG based on Willmott and Collins (2017) using the principles of ecological dynamics guide development of probing questions, encouraging participants to reflect on the role that the environment and individual traits or circumstances might play in the process of identifying talented athletes.

We piloted the guide with six elite-level coaches from basketball, volleyball and athletics. Following their suggestions, minor amendments were made and the final interview guide consisted of three sections. Section one investigated coaches' understanding of TID and their perception of the importance of this process (e.g., "What do you believe is the goal of talent identification?"). Section two comprised questions relating to coaches' TID processes and practices (e.g., "How do you identify a talented athlete?"). The final section aimed to elicit more specific information, with questions relating to the specific athlete attributes that coaches believe are important when identifying athletes (e.g., "Think of an athlete who you believe has the potential to succeed long-term. What sets them apart from other athletes?"). None of the coaches were asked about specific ages for athletes, but rather about the timeline required between identification and performance outcomes, which in most cases was defined as "peak performance", or competing at the Olympic Games. Interviews were audio-recorded and lasted between 30 and 128 minutes (*M* = 67 min).

Table 1. Example of interview coding.

Example meaning unit	Example code	Example category	Theme
Now that I'm older, instinct comes into it a lot more. I trust myself more. Know to take into consideration more things, like the family environment	Time spent coaching	Experience	Experiential Knowledge
[Instinct] comes with experience. It comes with the mistakes that you make, and that you recognise the mistakes so you get better, and the more you see the more examples you have	Recognition of examples	Experience	Experiential Knowledge
They do amazing work and you rely on sparring and drills, but in the end what counts is to have the proof in the realistic situation – the competition	Observations	Different scenarios	Context
You see, gut instinct is something that's [developed] over a period of time with the athlete	Time with athletes/ Instinct	Takes time	Temporal Factors
He has to fight a certain type of fight, because of his size. He's small … so you have to give him the technical ability and tactics to be able to fight that distance	Athlete constraints	Compensation	Experiential Knowledge

Data analysis

Data were analysed inductively using reflexive thematic analysis (Braun et al., 2019), as recommended for use in qualitative descriptive methodologies (Stanley, 2014; Vaismoradi et al., 2013). NVivo software (Version 12, QRS, Australia) was used to manage and code data using an iterative and interpretive analysis process, with movement back and forth between phases as necessary. The first step was familiarization which began through verbatim transcriptions by AHR immediately upon completion of each interview. After reading each transcript, initial codes were generated and collated to develop preliminary categories which were shared with two co-authors who acted as "critical friends" (Smith & McGannon, 2018; Smith & Sparkes, 2006), challenging the first author's interpretations and encouraging further reflection. This reflexive process helped to confirm the coding of certain units and facilitated the process of condensing codes to categories then refining themes. Categories were then collated into themes; and ongoing analysis and discussion used the principles of ecological dynamics to assist with the refinement, definition and naming of each theme (see Table 1 for example, coding). Rigour was addressed through reflexivity throughout the data collection and analysis process and keeping an audit trail (Nowell et al., 2017)

Findings

In order to contextualize the findings, coaches' attributes are presented first. Then the coaches' working definition of "talent" is outlined followed by the presentation of the emergent themes.

Participant attributes

Coaches were recruited based on their status as an expert coach, resulting in a wide range of ages, experience, education, and backgrounds. Their characteristics have been summarized in Table 2.

What is "talent"?

Talent identifies itself (coach 7)

All coaches believed that talent is something that makes an athlete stand out. It is the "X-factor" that makes a coach think "he's got something special". Coaches described a talented athlete as one who has "potential" and "natural" ability but is also willing to be coached and "put in the work". Talent was seen as a dynamic component, in that athletes can "become" talented. Coaches believe that (current) talent is something that anyone can spot, differentiating between seeing current talent and being able to predict who will possess it in the future. The idea of being able to identify talent was likened to a "prediction" or "forecast", and when coaches spoke of talent versus talent identification, it was separated into the idea of "current" versus "future" talent. Ultimately, all coaches agreed as to what "talent" and "talent identification" meant, but how they see and interpret this talent differs between coaches. Based on this understanding, we will define "talent" as the potential to perform well in the future (at the elite level), and "talent identification" as the skill of being able to judge the *probability* of future success and choose the "right athlete at the right time" (Coach 22).

Themes

Coaches stated that their primary method of decision-making during the TID process was "gut instinct":

> How am I gonna pick 'em? It'd be my gut instinct for sure (Coach 4).

During analysis, we identified four key interrelated themes that underpin "gut instinct". The four themes presented below are *experiential knowledge, temporal factors, seeing the athlete in*

Table 2. Coach characteristics.

SPORT	AGE	EXPERIENCE (YEARS)	GENDER	AFFILIATION
BOXING	51 ± 8.5	19 ± 7.9	1 F; 7 M	AUS; GER; NIR; SWE; USA
JUDO	49.8 ± 7.5	22.5 ± 8.9	1 F; 7 M	AUS; ENG; GER; IJF*; LUX
TAEKWONDO	45.5 ± 6.0	21.1 ± 8.6	8 M	AUS; BEL; EGY; ESP; FIN; NOR
COMBINED	48.7 ± 7.5	20.8 ± 8.3	2 F; 22 M	

*Coach educator for the International Judo Federation (IJF)

context, and *what can be worked with*, and show what information an expert coach gathers and interprets when making decisions regarding an athlete's talent.

Experiential knowledge

The ability to identify a talented athlete is one that coaches believe is built through extensive experience; even then not all coaches can accurately predict an athlete's ability. All coaches indicated that when identifying athletes their own experiences significantly influenced what they looked for. The "gut instinct" of the coach appears to be developed through years of experience with hundreds of athletes and seeing how different factors and attributes combine to create elite athletes; with a greater reliance on intuitive decision-making as they gain experience.

> Now I'm older, instinct comes into it a lot more. I trust myself more. Know to take into consideration more things, like the family environment (Coach 21).

Coaches could pinpoint that their increased trust and reliance on intuition was related to the concept of pattern matching and recognition.

> As you get more experienced, you have more and more examples of different ways, different people with different development, different patterns (Coach 22).

By recognizing "examples" they have seen before, coaches can to predict how different traits may interact to affect the long-term development of an athlete's talent. These traits, or "building blocks", work together to create skilled performance and all are equally cable of helping or hindering an athlete's potential.

> We call 'em building blocks. If a guy's weak technically or weak physically or weak mentally or has a bad lifestyle, he won't consistently deliver over a long period of time … Don't matter how good they are in one or two, all these building blocks gotta be in line to a certain point to get people producing and performing (Coach 7).

When asked, coaches could not choose any one aspect, trait, building block, or even category of performance variables as most indicative of future performance. Rather, they listed a series of qualities that were similar across the three sports, including timing, distance, movement, reflexes, physicality, fitness, tactical skills, intelligence and "game smarts". While it was viewed as important for athletes to have a minimum level in each building block (technique and tactics, lifestyle, physiology, psychology), coaches acknowledged that many athletes compensate, either consciously or subconsciously. As such, when coaches were asked to rank these qualities, many refused, as "what is *most* important is different for each athlete" (Coach 18).

> The kid who is mentally strong … he mightn't be great but because of his sheer desire and mental strength he'll get there (Coach 11).

> Because he was small, slightly built, he had to be that much fitter than everyone else … had to have the intelligence to know that and to compensate for his size (Coach 8).

Coaches recognized individual differences, both in compensations for and combinations of abilities, but also in the differing styles of athletes. As such, TID is not a "one size fits all" process, as "no-one is standard" (Coach 24).

Experience provides coaches with knowledge of what to look for in athletes. Visual observation is used to understand an athlete's physical, technical, tactical and even psychological qualities. While some of these aspects of combat sports performance can be measured, expert coaches tend to believe that "you can't test for what makes them good. It's all just observation, I need to see it" (Coach 14). The idea of being able to "see" talent was common throughout the interviews, as when it comes to an athlete's potential,

> You can see it … it's that timing, that distance, the movement, the reflexes, the boxing brain (Coach 10).

Seeing things that others cannot, or in ways that others do not, was a dominant feature of what coaches described as their "gut instinct", particularly in relation to seeing movements as though they were slowed down and in more detail:

> Did you ever see the film The Matrix? My gut instinct is when I see things in the matrix just slow … F**ing slow motion (Coach 4).

They also indicated that the ability to see things differently and therefore to pick the athlete with the most potential was a skill that not everyone had:

> Any idiot can pick the most talented person in the room, the skill is being able to predict who's gonna have it in five years, ten years (Coach 20).

Developing enough experience to identify talent confidently and reliably requires a significant time investment. Each coach indicated that they continue to improve with experience, and that while they still make mistakes, they can "recognize the mistakes, and you get better because of them" (Coach 27).

Temporal factors

Two key temporal features influence coaches' judgements and decision-making: The time available to develop an athlete, and the time it takes them to gather sufficient information to confidently identify said athlete. Coaches viewed TID as a long-term process with a high-performance outcome; an ongoing process which requires time to perform. Whilst the tasks of TID and talent development are inextricably linked, the timeline available for the coach to develop the athlete directly influences their decision-making processes. For example, when identifying athletes for squads, the closer to the target event the selection is occurring, the more "ready" an athlete must be. As such, the lead-time for major events has a significant impact on the decisions made by coaches. Ultimately, coaches perceive talent differently based on the amount of time until their event.

> I had two different 'teams' within my squad in the lead up to Rio – I had my Rio team and my Tokyo team. There are going to be a couple of athletes that overlap, but not many. When I'm doing ID for 2020 now, I'm picking different traits than when I'm ID-ing at the same time for 2024. They've got to be pretty ready for Tokyo – I can train them up a bit, but not change them now. But for Paris? I've got time. I can work with that (Coach 4).

Development timelines were dependent on the specific sport. Boxing coaches believed that four years was the minimum amount of time required to create an Olympic champion, assuming the correct "building blocks" were already in place, and as such athletes should be identified a minimum of four

years before their target Olympics. Taekwondo coaches believed that it would take a minimum of six years between initial identification and peak performance. In contrast, judo coaches felt that

> It takes around eight to ten years. Anything could happen in that time, but that's how long it takes to build them (Coach 27)

When questioned as to the time frame required to make their decision, no coach was able to give a specific answer, with one coach reflecting

> Put it this way: It would take as long as it would take to form a relationship [with the athlete] (Coach 7).

When identifying talent, although coaches continually referenced their "gut", "eye", or "instinct", they also indicated that they did not necessarily trust their first instinct. As intuition is developed through experience, it takes coaches several sessions with an athlete to fully form a judgement. Rather than making snap decisions, coaches instead used their instincts as more of a "divining rod" to tell them that they would "like to see more" of that athlete.

> You see, first gut instinct can be right or wrong. Gut instinct is something that's [developed] over a period of time … when somebody comes in and your first impression and your gut instinct is that this guy is good, 'till he's tested in all aspects, you could be wrong (Coach 4).

It was not enough for an athlete to demonstrate favourable qualities once or twice over a short period of time. In order to be identified as talented, coaches needed to see that their key indicators were stable over time, and adaptable to different scenarios. Each coach has their own preference for which contexts they need to see the athlete before making their informed decision.

Coaches all agreed that early identification was both possible and important to ensure that the best possible athletes are developed and to prevent talent loss from the sport. Expert coaches note an athlete's current ability but use that information to extrapolate future performance, whilst being mindful of the athlete's maturational status and the impact that may have on their perception of talent. Purely physical attributes (such as strength) were seen to be less important in the younger athlete, while factors such as distance management and reaction time were considered more "permanent" and therefore able to be used to predict talent.

> Some kids mature very early, so they would be very physical and yes, they would be winning competitions, but – at that age – in a year's time or two they may not be. 'Cause they just matured early. So it's not real talent (Coach 14).

Coaches know that "a lot of people that win underage titles don't carry on to be successful elite Olympians" (Coach 7), thus they do not place a high value on results from junior level competitions.

Seeing the athlete in context

Coaches consider the performance of the athlete within the broad confines of three different contexts: the individual, the environment, and the task. Coaches need to see the athlete perform different tasks under different environmental conditions, with different individual constraints in order to make an informed decision about their potential for future high performance.

Coaches agreed that watching an athlete compete was an essential part of the TID process. It appears that a single round is enough to tell a coach they should be watching an athlete more closely, with subsequent viewings of the athlete focused more on their *performance* in competition rather than their *results*.

> Performance is key. You know, you can't control the results. You can control the performance … Sometimes judges make funny decisions, so they – they may not end up the champion, but you know that they may have been the champion with a different set of judges. So that's the key part. It's the skill you're looking for, it's the performance piece you're looking at; results is [sic] not a good judge for talent ID (Coach 5).

Coaches also used competition to give them an indication of an athlete's intangible mental qualities, such as resilience, mental toughness, grit, determination, courage and desire.

> Courage and desire are more important than skill, because you'll get a lad who's just tough and you'll get a skillful lad, he can have all the ability but he can be bullied in the ring, the other guy will eventually get him (Coach 11).

What can be worked with

From these findings, it appears that the instinctual decisions of expert coaches are based on their experiences and knowledge, key temporal factors, and contextual information. The variability that was seen in TID comes from the coaches, or specifically, their perceptions of what attributes were "natural", and thus what can or cannot be developed in an athlete in a given timeframe. For example, Coach 1 stated that in three months,

> I [can] make him physically the best boxer … but when you don't have mentality, that's the problem (Coach 1)

In this context, "mentality" was the coach's description of all generic mental skills, but more specifically those related to resilience and work ethic. Later in the interview, when discussing athlete development, the same coach stated that "mental toughness and desire" cannot be taught, that they were inherent within each athlete. Many other coaches demonstrated a similar mindset, claiming that they were excellent teachers of technique, and as a result, they do not weight "technical ability" highly during the identification process as "I can give them that" (Coach 14).

Experienced coaches acknowledged that their own preferences and abilities influenced the identification process. Coaches who were less experienced believed that all coaches would pick the same athletes under the same circumstances, while those with more than twenty years of coaching experience expressed the opinion that they picked athletes based on what they could "work with". Whilst most selected athletes would remain the same, experienced coaches acknowledged that there would be a subset of athletes (not) selected based purely on their subjective judgements.

Discussion

The purpose of this study was to explore the judgement and decision-making process of expert coaches when identifying

talent and understanding *why* they select the athletes they do. These rich findings contribute to a greater understanding of "gut instinct" coach judgement and decision-making during TID and may help to inform practice. The ecological dynamics framework can be used to situate coach decisions within the constraints of the identification and to tease out some of the complexities of these interactions which ultimately result in the "intuitive" decisions made by coaches during talent identification.

The coach as a performer

Expert coaches "see" talent, yet, as in many other domains, they cannot describe exactly *what* it is that they are seeing (Wright & Bolger, 1992). Findings from this study suggest that coach decisions are driven by several key factors, reflected in the names of the themes presented above. It can be argued that an awareness of these factors and the knowledge gained from observing them is what allows coaches to "see" an athlete's potential. During TID, the coach's decision-making is constrained (and enhanced) by their own experiences and knowledge, the environment within which they are expected to form judgements of talent (e.g., competition, selection day, training camp), and the goal of the identification (e.g., long- or short-term performance goals). The idea that context is an integral part of talent identification supports findings by Lund and Söderstrom (2017) and Christensen (2009), however prior research has not explored the individual experiences and knowledge of coaches with reference to how that affects their concept of talent and how they identify it.

The association between what coaches believe can or cannot be taught, and who they believe are talented, appears to be unconscious. As with athletic performance, coaching performance is subject to affordances, or opportunities for action. The current findings indicate that coaches appear to identify athletes based on their own abilities as a coach, rather than solely on the perceived capabilities of the athlete. "Trainable" factors (strength, speed, etc.), those which coaches believe can be developed over time, are not considered important when predicting talent. Other factors, such as "mental attitude" were considered by coaches to be fixed and "untrainable", regardless of the age of the athlete, therefore imperative for an athlete to already possess. When identifying athletes, coaches are aiming to identify those with whom they have the greatest opportunity for improvement (action). This has particular significance for the ecological validity of future research. Current practice in TID research is that, typically, the coaches or scouts involved in the research are not those who will be coaching the identified athletes in the future. As coaches appear to identify athletes based on their own abilities, future research should strive to incorporate the coach who will be responsible for the athletes in their investigations.

By applying the lens of ecological dynamics to the process of TID, we can see the coach themselves as a significant factor in the process rather than the typical athlete-centric approach; as well as further our understanding of judgement and decision-making (i.e. behaviours) of coaches during talent identification. When the coach is positioned as the performer (as opposed to the traditional ecological view of the athlete as the performer),

they are subject to their own individual constraints (perceived coaching strengths, experience as athlete and coach, emotional states, etc.); the dynamic environmental constraints (number of athletes present, context in which they are coaching/observing athletes); and task constraints (event they are identifying/selecting for, how long they have to develop athletes). Talent identification can be described as a skilful activity and experienced coaches approach this task with *skilled intentionality* – using their ability to identify talent in a deliberate way, shaped in turn by their grip on the situation (Bruineberg & Rietveld, 2014). Similarly to findings in other sporting contexts, expert coaches are able to attune to the relevant contextual information and adapt to changes in performance goals and environments (Connor et al., 2020).

The decision-making literature has found that when experts make decisions, their own abilities are considered as part of the decision-making process (Weber et al., 2005); a finding that is echoed by the coaches in this study through their implication that the most talented athletes are the ones whom they can "work with". Specifically, coaches emphasized that the identification of athletes was highly dependent on the temporal context of the identification – what are they identifying them for, and how far away is the event? While it has been anecdotally acknowledged that in many situations different coaches will choose different athletes, until now there has been no research as to the reasons behind this variation. Research into intuitive decision-making has demonstrated that judgements and subsequent decisions are made through the retrieval of task-relevant information from an individual's experiential knowledge, and that they are relative to the context (environment) in which they are being performed (Weber & Johnson, 2009).

Appropriate talent identification

The findings of this study demonstrate that elite-level coaches perceive talent as multi-faceted, as reported in previous research (Day, 2016; Wright & Bolger, 1992). However, we extend upon this by demonstrating that coaches inherently use a constraints-based approach to identify the organismic, environmental and task constraints (and their interactions) that are the important, inseparable aspects underpinning an athlete's talent. As coach 7 demonstrated through his "building blocks" analogy, coaches have an intrinsic understanding of the interactive nature of constraints and how they shape performance, as "it's all related, in many ways, you know?". The idea of athlete compensation is another example of the interacting constraints and the idiosyncrasies of said dynamic components. By acknowledging that long-term athletic success requires adaptation to changing constraints over time (Fraser-Thomas et al., 2008; Stambulova et al., 2009; Wylleman et al., 2011), coaches were also recognizing the non-linear development of athletes. Both athletes and coaches must adapt to changes in constraints, and those changes are often nonlinear and frequently unpredictable (Davids et al., 2008). Experienced coaches are better able to forecast these changes and their potential effects on performance, thus better able to identify talented athletes.

Coaches came to trust their "gut" more as they gained experience. If intuition is "the way we translate our experience

into action" (Klein, 2003), then the idea of becoming more reliant on intuition as they gain more experience is entirely logical. In line with the work of Day (2016) and Christensen (2009), the coaches explained how their viewing of multiple athletes and situations allowed them to build mental models of what talent looks like, while also learning how different traits can combine in both positive and negative ways to ultimately affect long-term performance potential. It is interesting to note that when reflecting on their prior identification experiences, coaches seemingly rely only on their mistakes ("false positives") to learn from, rather than also explicitly recalling occasions in which their forecast was correct. This may be due to a lack of successful identifications by the coaches in question, or simply a consequence of the focus in many coach education programmes to reflect on the "negatives" rather than the "positives".

These findings need to be further explored within a practical, applied environment, and across different sports and age groups. Some of the results from this investigation may be a factor of the level of coach interviewed (i.e. elite, international-level coaches) and/or the nature of combat sports which, in essence of performance factors, are very different to both team sports and other individual sports. As coaches are expected to identify talent as part of their job, future research should focus on the time, information, contexts and experience needed for a coach to make a reliable decision regarding an athlete's talent. The current findings highlight that coaches need to view athletes under many different conditions over a longer period. Future work could include coaches from a broader range of countries in order to ascertain geographical/cultural differences during TID and expert coaches who work in junior sporting domains where TID decisions are made at a time that is arguably more important in the athlete's career. Finally, a multiple-interview design with one or more coaches, ideally tracking their thought processes as they evolve over several interviews, may provide more explicit detail about this "gut instinct" that is so critical to practical TID.

Conclusions

The current research identified that expert coaches rely on their *experiential knowledge, temporal factors, seeing the athlete in context*, and knowing *what they can work with*, to make "gut instinct" decisions during TID. These informational sources can be understood through the application of an ecological dynamics framework, allowing for idiosyncrasies and contextual complexities for both the athlete and the coach and accounting for changing opinions in a dynamic environment. An understanding of expert coach intuition is an important addition to this field of research as coaches have an important, yet often underutilised role within TID research and practice.

A challenge for future research is to understand how coaches attune to the information necessary to make decisions related to the identification of talent. A greater understanding of these information sources will enable national sporting organizations to better arrange TID opportunities for coaches, as well as providing guidance for teaching coaches how to best predict future talent.

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