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Embedded, embodied, enculturated, and enabling processes:

The identification and evaluation of sporting talent by ice hockey coaches in Norwegian youth national teams

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Abstract

Elite sports systems are characterized by structured attempts to identify, select and develop talented athletes and to increase the likelihood that athletes will achieve future international success. Studies of such systems have focused mostly on the procedures and measures that are intended to improve talent identification, but less attention has been given to the crucial role of coaches. The aim of this case study is therefore to explore how coaches of Norwegian youth ice hockey national teams identify and evaluate sporting talent within these structured settings. The data were generated using nine semi-structured interviews. These interviews included questions about how coaches identify talent, and discussions about four hypothetical examples of ice hockey players, each with specific histories and skill sets. Building on recent developments in motor learning research, we contend that coaches identify and select talent using embodied (rather than entirely rational or cognitive) processes. These approaches are embedded in the ebb and flow of situated sports performances, and shaped by the broader, unique cultural settings in which they are situated. The results of this study show that talent identification and evaluation of sporting talent cannot, and should not, be separated from the subjectivities of the coaches themselves or from their individual preferences. The implications of this study for future research, policy and practice are discussed.

Keywords: Talent identification, decision-making, intuition, sports coaching, elite sports systems

Introduction

Elite sports systems are characterized by attempts to identify, select and develop talented athletes and to increase the likelihood that athletes will achieve future international success (Weissensteiner, 2017). The extensive processes and apparatuses of sport talent identification have expanded in parallel with, and in response to, the professionalization and commercialization of modern, competitive elite sports (Till & Baker, 2020). As a consequence, national governing bodies and professional clubs invest substantial resources in talent identification processes so that they can profit from the commodification of elite athletes (Gammelsæter & Loland, 2022). Paradoxically, empirical research has shown clearly that current systems are unable to identify talented athletes accurately and reliably (Johnston et al., 2018), and that there is either a weak association – or no association – between early talent identification and later senior success (see, for example, Bjørndal et al., 2018; Herrebrøden & Bjørndal, 2022). Dixon et al. (2020) argue that this is because of the strong influence of growth and maturation on performance in youth sports, coupled with the complex and nonlinear nature of skill learning and development, as highlighted by Pol et al. (2020). Increasing evidence suggests that understanding talent as a characteristic that can be measured and predicted is a flawed approach, and that talent identification is neither an objective nor a clearly-structured process (see, for example, Roberts et al., 2020; Wiseman et al., 2014).

Coaches are key stakeholders in talent identification processes because they act as gatekeepers, distributors of resources, and as athlete mentors (Skrubbeltrang et al., 2021). Focusing on how coaches identify and evaluate athlete talent is therefore an important and novel approach. In their qualitative review, Lath et al. (2021) suggest that coaches' evaluations of talent are syntheses that are characteristically: (a) intuitive; (b) subjective; (c) experience-based; and (d) holistic. In effect, this means that coaches identify talent through qualitative observations that are based on their embodied feelings (Christensen, 2009). How one thinks

about, and how one evaluates, talent in sport varies between individuals and across organisations and cultures (Bjørndal et al., 2015). The knowledge and dispositions of coaches can therefore be understood as expressions of the implicit paradigmatic values and assumptions which are embedded within sport coaching cultures (Bjørndal et al., 2022). The decisions they make are also strongly influenced by their own experiences and implicit preferences (Lund & Söderström, 2017). As such, as Araújo et al. (2019, p. 1) suggest, the expert decisions and actions of coaches can best be understood as expressions “of embedded and embodied cognition”.

It is therefore remarkable that only a handful of qualitative sports studies have focused on contextual accounts of talent identification from the viewpoint of coaches (for a review, see Roberts et al., 2019). Developing a more context-based understanding of how coaches practice of talent identification and evaluation is important. Reconceptualising the processes of talent identification and evaluation is imperative, especially in the context of ice hockey where such approaches are especially limited (Baker et al., 2020).

Our study challenges the common understanding of talent as something that an athlete either *has* or *is*. We contend that talent identification and evaluation are relational phenomena which reside in the dynamic, complex relationships between people (such as coaches, athletes, family and friends) and are set within specific contexts. Relational phenomena also occur as people interact with the “non-human elements” of elite sport systems, such as talent selection procedures (tests and measurements, for example), talent development activities, such as regional teams and competitions, and international competitions¹.

¹ For a more comprehensive review of talent as a relational phenomenon, see Skrubbeltang, L. S., Olesen, J. S., & Nielsen, J. C. (2021). The coach as gatekeeper, distributor of resources and partner for sports talents. *Sports Coaching Review*, 1-19. <https://doi.org/10.1080/21640629.2021.1978730> .

Inspired by Markula (2019), we attempt in this paper to investigate sport talent identification by integrating new theoretical perspectives and approaches in motor development research (see, Adolph & Hoch, 2019) with critical perspectives from sociological theory. We argue that processes of talent identification and evaluation can be better understood as embedded and embodied processes (rather than completely rational or cognitive ones).

Individuals are shaped by, and shape, the physical and socio-cultural environments in which they reside. When athletes are selected to talent development activities, they are offered new opportunities and challenges that are inherently uncertain and unpredictable (Bjørndal & Ronglan, 2019). As such, talent identification and evaluation are embedded in the ebb and flow of situated sports performances (i.e., they are located within the specifics of game settings). We argue, therefore, that talent identification processes are shaped by wider social influences and values, by culturally-specific coaching practices, and by the embedded cognition of coaches within these specific sporting contexts.

In this paper, we examine talent identification and development processes by applying Adolph and Hoch's (2019) theorisations of motor development and psychological development, and through the application of sociological theory. This interdisciplinary approach, we believe, provides a rich analytical toolkit with which to examine the complex phenomenon of talent identification, which we apply here within the specific ecological niche of Norwegian youth ice hockey. We acknowledge that applying multiple ontologies is challenging, especially because motor development and talent identification are distinct phenomena, each shaped by multiple, contingent, and conflicting factors (Marshall, 2008). However, our context-sensitive research design and qualitative analysis, is intended to demonstrate the value of more holistic approaches.

Methods

Design

Case studies are especially well-suited to developing and integrating conceptual and theoretical insights because, as Yin (2017) argues, they allow the assumptions that emerge from empirical research material to be re-evaluated continuously. Our research was designed as an instrumental case study to investigate how coaches identify and evaluate talent in the context of Norwegian youth ice hockey. In line with our study's purpose, this instrumental study uses a particular case to gain a broader appreciation of an issue or phenomenon (Stake, 1995). The analytical units we have used are the experiences and evaluations of talent identification by youth ice hockey coaches.

We conducted semi-structured interviews to explore how coaches understood and interpreted the processes they applied when identifying, evaluating and selecting players for talent development activities. During the interviews, each coach was introduced to vignettes of four fictional ice hockey players. According to Atzmüller and Steiner (2010, p. 128), a vignette is “a short, carefully constructed description of a person, object, or situation, representing a systematic combination of characteristics”. Vignettes are useful in social research because they present contextualized content that can help to reveal and explore respondents' beliefs and understandings about specific scenarios. They can also help to clarify evaluation processes, and aid the comparison of different perceptions (Barter & Renold, 1999). The use of vignettes as a discussion and evaluation tool has become an increasingly common research tool in disciplines such as healthcare (Tremblay et al., 2022) and management studies (Hermkens et al., 2019). However, this approach has rarely been used in sports science and coaching.

The purpose of using the vignettes was to provide common interrogative content that would allow us to examine, with consistency, the methods coaches use to identify and prioritise players who they believe have the greatest potential to succeed. It also allowed the coaches to

explain why and how they make their judgements. These vignettes were developed using material from talent scout reports (NHL, 2020), empirical findings from previous studies of talent identification and evaluation (Fuhre et al., 2022; Guenter et al., 2019; Lund & Söderström, 2017; Nesse et al., 2020; Roberts et al., 2020; Wiseman et al., 2014), and the study authors' experiences from ice hockey and others sports. The purpose of using multiple sources was to create scenarios which would be as realistic – and as plausible – as possible to the coaches. The interview guide and vignettes were piloted with two youth ice hockey coaches, and minor changes were made to the storylines based on the feedback we received (see Table 1 for a detailed outline of the vignette contents).

Prior to the data collection, approval from the Norwegian Centre for Research Data (NSD) was obtained (nr. 423183).

Context

The Norwegian Ice Hockey Association (NIHF) is responsible both for grassroots participation in the sport and for elite sports development. It is also responsible for the policy and funding system for ice hockey in Norway. In 2019, the NIHF had 16779 members, of whom 6106 were under 13 years of age, and 3126 were aged between 13 and 19 years (Norwegian Confederation of Sports, 2020). In Norway, ice hockey is a relatively minor sport compared to other sports such as football, handball, and cross-country skiing. However, the Norwegian national teams qualify regularly for international championships (the men's and women's national team programmes, for example, are currently ranked in the top 12 countries in the world by the International Ice Hockey Federation's (IIHF)). Talented Norwegian players continue to progress to professional hockey leagues beyond Norway (e.g., in the United States of America, Canada, Germany and Sweden).

In Norway, no national system exists for talent identification and development. Instead, the responsibility for athlete development resides with each sport association. Within these associations, grassroots participation and elite sport development are typically seen not as distinct concerns but rather as part of the wider national sport policy and funding system. Compared to most national or academy-based programme in other countries, this model represents a clear point of difference because it is, in effect, a broad-based voluntary movement. Norwegian legislation prevents both the formal ranking of results, and structured talent identification and development when players are under the age of 13 years (Bjørndal et al., 2015).

In Norwegian ice hockey (as in most other Norwegian sports), the athlete development model is decentralized and athlete development emerges therefore through the interplay between club-based practice and competition, compulsory secondary sport school programmes, and the regional and national player development initiatives (e.g., youth national teams) provided by the NIHF. The association-driven development initiatives at the national level are offered to athletes from the age of 15 years.

Participants

Ten coaches were purposefully sampled through the website of the NIHF and contacted directly via email to ask if they wished to participate in this study; nine agreed to do so. The coaches were chosen because of their involvement in selecting athletes for youth national teams and/or the NIHF's national talent development initiatives. In Norwegian ice hockey, coaches are not classified as either "youth" or "senior" coaches, but most coaches progress first to senior teams once they have gained experience as youth coaches. The following study inclusion criteria were applied: coaches had to be (a) currently coaching Norwegian men's

youth national teams (i.e., Under-16, Under-18, and Under-20); or (b) responsible for overseeing and quality-assuring player development in the NIHF; and (c) willing to participate in the study and share their experiences. We included these two different coaching roles so that we could obtain complementary perspectives about the processes of talent identification and evaluation.

National team coaches face the challenging task of selecting players for camps and matches, and coaches responsible for player development collaborate closely with various regional and national teams to create the best possible developmental opportunities for Norwegian youth ice hockey players. We decided to include coaches from men's teams only because the number of registered male players is greater, and the underlying complexity of identifying talented players is therefore amplified (Baker et al., 2019).

Our study sample consisted of seven ice hockey coaches from the national Norwegian teams for boys (in the age-specific categories of U16, U18, and U20), and two player development coaches from the NIHF. All the coaches were male. The average age was 37.67 years (SD= 9.53), and the coaches had, on average, 10.33 years of experience (SD= 5.10). Eight had professional playing experience, eight of them had, or were currently undertaking, university-level education, and seven of them had the highest Norwegian national coaching certification in ice hockey (Level 3). All the coaches provided written consent on the understanding that all the information they provided would be anonymized to protect their identity. To that end, the coaches in this study have been coded numerically, from 1 to 9, and classified according to their respective age-team roles.

Data collection

The purpose of our interviews was to explore the coaches' evaluations and selections of sporting talent. Each interview was divided into three parts. In the first part, the coaches were asked

what they understood the concept of “talent” to mean. In the second part, the coaches were asked how they identified and evaluated talent. In the final part of the interview, the coaches were asked to evaluate the future potential of each of the four players described in our player vignettes. A complete version of the interview guide can be found in Appendix A.

The first author conducted the study interviews in February 2021. Due to the Covid-19 pandemic, the interviews were organised and conducted online using the Microsoft Teams platform. All the interviews lasted between 56 and 122 minutes (M= 76 min), were audio-recorded, and then transcribed verbatim. Our impression was that the coaches were very interested and engaged in the study and that their thoughts and experiences were shared willingly. The vignettes, in particular, led to strong engagement, and the coaches indicated that the task of deciding which players had the greatest potential was a challenging one.

Data analysis

This study utilized the six-step iterative analytical approach detailed in Braun and Clarke (2006). In the first step, the first author familiarized himself with the interview material by reading each transcript. During the process of sharing and discussing his initial analysis with the other authors, the last author (an experienced university lecturer and coach-educator in motor learning) suggested that Adolph and Hoch’s (2019) conceptual framework for analytical categories be used in the study. The other three study authors agreed with this suggestion and familiarized themselves with the framework. In the second step, the first and last authors conducted initial data coding using deductive reasoning and a theoretically-driven approach which was grounded in Adolph and Hoch’s (2019) four conceptual categories: (a) embodied; (b) embedded; (c) enculturated; and (d) enabling. Third, the first author then re-read the transcripts critically to identify further potential analytical material that may have fallen outside the scope of the initial

theory-informed coding. In the fourth analytical step, the initial coding was then rediscussed by the authors to develop preliminary key topic categories from the data material. Data with similar characteristics were then grouped together, and new categories were created when needed. In the fifth step, the categories were then collated into four main themes. Finally, the authors collaborated on writing the findings so that the data could be presented and reported comprehensively, cohesively, and in a mutually agreed way. Appendix B includes examples of how the analytical process was developed, from the documenting of the initial responses of the coaches through to the final division of the data into distinct, key themes.

Results

Talent identification as embodied processes

The study interviews revealed that the talent identification and evaluation processes conducted by coaches are embodied and comprehensive. In the interviews, it also became clear that these processes were informed by the complex subjective experiences and embodied intuition of the coaches. Talent identification, as Coach 4 noted, occurs primarily through careful observation:

The most important thing is to get an overall impression of who the player is. It may sound a bit silly, but I prefer to observe, sneak around, and see and hear different things about the players [...]. I think the experience that I have developed over several years as a coach makes me more confident in the situations that arise.

The coaches' choices appeared, therefore, not to be based exclusively on conscious rational processes. Instead, they were embodied endeavours that emerged from the specific individual, environmental and task constraints of the coaches, and were affected by their perceptual, cognitive, and affective systems:

The eyes are the most important tool you have. But I also prefer to talk with the players. When I talk with the players, I get a sense of whether the player is good or not – almost [...]. It is a kind of gut feeling there. It is a bit of style, a bit of flow – something that gives me a good feeling (Coach 7).

Talent identification was described by the coaches as a comprehensive process in which they attempted continuously to find out as much as they could about the players. This included gathering information through game and practice observation, personal meetings with the players in a variety of settings, and through conversations with other coaches and people associated with the players (e.g., family members, teachers, and talent scouts). The coaches described how they evaluated and analysed players by putting information together, like the pieces of a puzzle. However, it was apparent that these judgements were shaped by the embodied nature of the talent identification processes.

The complexity of the decision-making became especially clear when the coaches were asked to evaluate the long-term potential of the players we described in our vignettes. None of the coaches believed that *Markus* (described as being a naturally “gifted” player who had offensive game skills but personal challenges off the ice) was likely to succeed in ten years, but their interpretations of the long-term potential of the other players were mixed. Four of the coaches thought *Jonas* (a player described as having exceptional game intelligence) had long-term potential; three thought *Ulrik* (the physically robust and defensive player) would succeed; and two believed that *Daniel* (the hard-working and dedicated player) was likely to achieve success. All the coaches we interviewed are expert coaches, and the differences in their judgments therefore cannot be regarded as an indication of the rightness or wrongness of their choices. Instead, it suggests that talent identification and evaluation processes depend on the individual and cultural preferences of coaches, and their own interpretations of what talent is.

Talent identification as an embedded process

Talent identification and evaluations are embedded processes, the validity of which cannot be assessed outside specific game contexts. Significantly, none of the coaches in our study were able to provide or articulate clear formulae for talent identification, and this suggested that talent identification was far from a prescriptive process. Talent is, as the coaches observed, extremely difficult to identify and the processes of talent identification depend largely on the individuality of the players within particular game contexts. As Coach 9 reflected: “Ice hockey is such a complex sport that we need so many different [talent] types. There are so many things that we must see and look for, and not least build on and value”. Some players were regarded as talented by the coaches because they had phenomenal technical skills, others because they were hard-working players who were willing to sacrifice themselves by working harder and longer. The coaches therefore reasoned that talent was something “extra” that particular players were able to demonstrate – and that it was this extra, relative detail that made them stand out from their peers.

When we asked the coaches what *specific* player criteria and/or characteristics were most important to the process of identifying talent, they argued that this depended both on the circumstances and on the individual players. All were able to provide lists of skills and abilities that they saw as important. These included technical skills (e.g., basic skating and puck skills), tactical skills (e.g., game intelligence, positioning), physical skills (e.g., speed, strength, coordination), psychological skills (e.g., motivation, drive), and psychosocial skills (e.g., character, personality, being a team player). However, there was also a consensus that these key characteristics varied by player:

It all depends on what type of player it is. There are so many different skills and qualities that are required to succeed. Just look at today’s defenders. You can see magicians who are fantastic skaters dancing forward and backward, dictating powerplay and scores from the blue line. At the

same time, you can see more defensive types keeping players on the outside, blocking out in front of the goal, and logging 25 minutes for the team, every game, without anyone even noticing that they have played (Coach 6).

The coaches therefore stressed the importance of maintaining a flexible approach to talent identification and the need to adapt talent identification processes to the specifics of each player. Some also observed that the pace of change in ice hockey has been significant in the last decade and is ongoing. The unpredictability of ice hockey's future was seen as something that both created and constrained opportunities for particular types of players. Examples of such changes included adjustments to the off-side rules of ice hockey and changes to playing tactics: "Before, many laughed at shipping the puck glass out", commented Coach 2, for example. "Today, this is almost necessary to maintain or reduce the speed of the game". The coaches thus contended that talent identification procedures are situated within constantly changing contexts and that this also made it difficult to prescribe and pre-define preferred skill sets or gameplays.

Talent identification as an enculturated process

Talent identification and evaluation are shaped by culturally-specific coaching practices and preferences. For the coaches, the personality and character of the players they coached were of particular importance when evaluating the long-term potential of players: "I think it is the drive – the will to compete and win – is that which separates a good from an average player", reasoned Coach 5. These psychosocial factors in ice hockey were also defined as "the Norwegian standard" and based on the Norwegian Ice Hockey Federation's official policy for talent identification and development which has created a cultural frame of reference in Norway, and focuses explicitly on the qualities of ambition, execution, competition, and collaboration:

When it comes to talent identification, I would say that these words [“ambition”, “execution”, “competition”, and “collaboration”] shape what we should look for. Do we believe that these players could succeed later? What attitudes do they have? How dedicated are they? Are these players who have ambitions and compete all the time? (Coach 9).

The coaches also indicated that when they evaluated the potential talent of a player, they believed that a player’s personality and character were more important than their skills on the ice. “If ... (the player has) the ambition and drive”, Coach 3 explained, “if the player doesn’t tolerate some adversity, it will be difficult to become a professional ice hockey player”. The prioritization of players’ psychosocial characteristics was reflected, too, in the coaches’ responses to the vignettes we presented in the interviews. A common impression among the coaches, for example, was that the player *Markus*, the naturally “gifted” player who was ahead in his development, was less suitable because of his behaviour and the personal obstacles he faced:

Markus seems like an exciting player but has faced some challenges off the ice. If we speak about talent in this case, it is the player on the ice who is thrilling, but we see that there are some red flags coming (Coach 6).

In the vignette, Markus was described as being a player who was struggling at school and who had made new friends outside ice hockey who enjoyed partying on the weekends. The coaches believed that *Markus* was standing at a crossroad in his development as a player who wanted to commit to an elite sport career. In their experience, players who lost their drive at an early age were often surpassed by others: “I once had a player who almost completely fitted the description of this boy who was very good early. He lived his life on a banana peel, and it usually doesn’t go well in the end” (Coach 4). These attitudes demonstrated that talent identification is a historical and enculturated process in which development is seen not as something that occurs at specific moments, but as a process that occurs over time.

Talent identification as an enabling process

Talent identification was seen by the youth ice hockey coaches as an enabling process in which multiple types of learning could be set in motion and continue over time. One coach noted: “It is about giving the players that the coach considers to be talented better conditions for development [and] to optimize the development” (Coach 1). The coaches emphasized the challenge of predicting long-term potential and performance: “We never know if what we are doing is correct. It is a bit like looking in the dark”, observed Coach 3. They also argued that decisions related to the identification and evaluation of talent were crucial but also a “double-edged sword” because of the limited availability of resources:

It is also the case that ice hockey is not that big in Norway. Therefore, we need to protect those who eventually develop into top players. [At the same time] we may spend a lot of resources on players who never succeed. But that is something we never know (Coach 8).

The coaches uniformly recognized that the unpredictability of talent identification and development was problematic. Coach 2, for example, reflected on the randomness of change:

There is a lot that can happen along the way. Some may develop a taste for blood along the way, while others lack the drive to step on the pedal and [then] drop out. I have seen players who suddenly found and stepped on that pedal when they were 16 years and shot ahead speedily from there. I have had several players who have come in who have looked like 13-year-olds, but who got to play matches at a high level due to their willingness to finish off the race. If you had told me then that these players would play in the [First League] in a few years, I would, most likely, have shaken my head in disbelief.

The interviews revealed that talent identification and evaluation processes are located in the dynamic relationships between coaches and athletes, and between the formal requirements of talent identification and development systems, on one hand, and the specific

requirements within organisational setting, on the other. These processes are therefore relational phenomena. Coach 7, for example, reflected on the challenges of evaluating a player's potential in multiple contexts and environments:

Some players are very good in one environment but can function poorly in another. This means that you can never fully know the talent outcome. For example, a transfer or change from one club to another, Norway to Sweden, or Sweden to the National Hockey League. You're going through quite a bit then. Can that player do the same there as before? Maybe not. There are many who fall through and some who flourish.

These examples of the nonlinearity of talent development suggests that there is no single, definitive pathway of talent identification, or a formula for talent evaluation and selection/non-selection. Players, as the coaches noted, progress at different tempos and are selected at different points in their careers. Athlete development depends on ongoing access to new opportunities. The complexity and changeability of the talent identification system therefore makes the role of coaches as talent gatekeepers especially critical.

Discussion

The empirical material from our interviews indicates that a deeper understanding of talent identification and evaluation processes requires a recognition that such processes are embodied, embedded, enculturated and enabling, and occur both within specific organisational contexts and within broader, unique cultural settings. A more comprehensive toolkit for (re)analysing complex problems can be developed by integrating the conceptual insights of natural science with critical social theory (Markula, 2019). Notably, more holistic approaches are largely absent in current research and policy which tend instead to objectify talent identification through reductive testing and measurement, and focus on the quantification of performance.

The experienced coaches in our study based their evaluations and judgments of athlete talent on their own careful observations and emotional reactions, and on their own intuition. This suggested that the talent identification and evaluation processes they applied were neither objective nor (entirely) rational. There are good reasons, therefore, to suggest that objectifying talent identification through standardized tests and measurements is of limited value for at least two key reasons. First, standardized tests and measurements necessarily reduce, fragment and decontextualize the complex, relational acts of sports performance into compartmentalized modules (Bjørndal et al., 2022). In doing so, the interactional nature of sports performance is lost. Second, a large body of research has demonstrated that the standardized testing and measurement, and the surveillance technologies that tend to be used, can have major disciplinary effects on athletes' bodies, feelings, and thoughts (Mills et al., 2020). These can limit skill learning and performance development significantly and even result in overuse and injuries, damage to players' psychological well-being, and a loss of motivation in sport (Mills & Denison, 2018).

The understanding that expert decision-making is an emergent process within individual, environmental and task constraints cuts through subjective-objective dichotomies. While the outcomes of such forms of decision-making may be far from predictable, this should not lessen their value or allow them to be regarded as secondary in importance compared to standardized testing (Araújo et al., 2019). Studies in sports coaching have shown clearly that professional coaches orchestrate their actions and decisions based on careful and skilful observations of contextualized events (Santos et al., 2013). Further, it is important to recognize that expert decision-making and intuitive expertise draw upon broad, holistic oversights and interpretations, rather than singular events. The nature of embodied affectivity speaks to the interconnectedness and entanglement of psychological, physical, and social processes (Fuchs & Koch, 2014). If, as

the coaches in our study suggested, talent identification is best *not* done through objectification, then talent evaluations would be better situated within the actual flow of sports performances.

There are two further reasons why in-game talent assessments are likely to be of greater value. First, team performances in sport are relational in nature and there are numerous ways in which effective tactical performances can be achieved (Araújo & Davids, 2016). This indicates that there is no single way of becoming an ice hockey player, and that talented players possess and enact unique skill sets. By recognising the dynamics of talent identification and evaluation, researchers and practitioners can move beyond the common understanding of talent as something an athlete either *has* or *is*, and turn their attention more to performativity and how talent comes into being through actions (Olesen et al., 2020). General position-specific skills are required in ice hockey, and players need to master these *sufficiently*, but lower thresholds are possible for other talent factors (e.g., physical capacity). Innovative and creative behaviours may also emerge in unexpected and unpredictable ways, and may often only be recognised outside the conventional talent development frameworks that are typically applied within elite sport systems (e.g., structured, coach-led practice) (O’Sullivan et al., 2021). In team sports, for example, rule changes sometimes lead to innovative development. Other creative behaviours may emerge from planned or unplanned experimentation and tinkering, which most likely will not be revealed within a formalised, high-pressure, high-stakes, selection-based sports environments. Skills and talent, therefore, are not traits possessed by individuals alone. Instead, they are relational phenomenon that emerge from the athlete-environment system, and are shaped by the changing constraints and opportunities of the environments in which they are located (Hristovski et al., 2012).

The wider effect of cultural contexts and relationships shape what is recognised and valued as talent within sport (Vaughan et al., 2021). Like all social practices, talent identification and evaluation are forged within different specific historical, cultural, and social

contexts. These contexts also shape the preferences and practices of athletes and coaches (O’Sullivan et al., 2021). Recent cultural comparative research into team sport cultures have shown, for example, how players’ skills emerge, develop, and are shaped by, unique sociocultural constraints and perceptions, and how these influence athlete performance in different ways (Vaughan et al., 2019). In Canada, for example, talent scouts who have evaluated draft-eligible youth players in the Western Hockey League have reported that they value intangible player characteristics such as competitiveness, passion, character and leadership when determining whether players will fit with the organisational culture of teams (Guenter et al., 2019). Similarly, the coaches in our study demonstrated clearly that the player characteristics, psychosocial skills, and attitudes that the coaches valued especially were, in effect, determined by the values of the Norwegian Ice Hockey Federation. Research in sports coaching has shown how understanding values, belief-systems and perceptual attunement is central to understanding how coaches frame their judgments and decision-making (Mills & Denison, 2018). It is therefore necessary, according to Vaughan et al. (2019, p. 3), that “[s]ports development frameworks aimed at practice should emerge from, and evolve in, interaction with the sociocultural context in which practitioners are embedded”.

Talent identification and evaluation can have a profound effect on sporting careers because selection enables new possibilities for athlete development. However, given the non-linearity of complex systems, the processes of talent identification and development can result in ongoing sequences of change that cannot always be predicted. All the coaches we interviewed shared examples that illustrated the dynamic nature of these processes. Talent identification and evaluation, like motor development, as Adolph and Hoch (2019, p. 157) reason, “cannot be repeated in the same way in every situation because bodies, environments, and tasks are in continual flux”. It is important therefore to interrogate the evident lack of success in pre-adulthood talent identification in most sports. Multiple pathways can lead to

senior success and it is crucial that elite sport systems are therefore able to support multiple and varied pathways to development, to ensure that these do not become normative obstacles that limit athlete potential (Gulbin et al., 2013).

Limitations and future directions for research and practice

The sample size of this study was limited, and we acknowledge that a larger data set with more diverse coaching experiences may have helped to enrich and deepen our findings and analysis. Further, the data gathering in our study was limited to interviews. Other sources of (qualitative) data may have helped to expand the scope of our analysis and influenced the conclusions we have drawn². We suggest that future research should therefore focus on further cross-cultural comparisons within, and beyond, youth ice hockey. The use of longer-term and more in-depth studies may also be warranted (including additional data gathering methods, such as participant fieldwork). Furthermore, phenomenological studies of the (inter)subjective nature of talent evaluation (e.g., studies of embodied cognition and embodied affectivity) may also help to deepen the understanding of talent identification and evaluation processes, and how the tacit knowledge and attitudes of coaches are developed, accessed, and shared. Critical sociological and psychological studies could also help to facilitate an exploration of how athletes within dynamic social networks and material power-relations are recognised and classified as “talented”. An appreciation of the social-cognitive effects of such networks on the perceptions and preferences of coaches, we believe, will facilitate a deeper understanding of coaching and talent identification practices, and offer greater insights into the causes of their (un)reliability.

² For quantitative tools, see, for example, recent attempts by Ford, P. R., Bordonau, J. L. D., Bonanno, D., Tavares, J., Groenendijk, C., Fink, C., Gualtieri, D., Gregson, W., Varley, M. C., Weston, M., Lolli, L., Platt, D., & Di Salvo, V. (2020). A survey of talent identification and development processes in the youth academies of professional soccer clubs from around the world. *Journal of Sports Sciences*, 38(11-12), 1269-1278. <https://doi.org/10.1080/02640414.2020.1752440>

Sport governing bodies and practitioners should use this new knowledge to: (a) reduce their efforts to identify and evaluate talent through quantitative measurement and, instead, utilize coaches' experiential knowledge (Woods et al., 2021); (b) interrogate how sociocultural constraints influence coaches' preferences, perceptions and evaluations (Vaughan et al., 2022); and (c) acknowledge that talent identification and development are characterised by high levels of uncertainty and unpredictability regarding future outcomes; and (d) focus on how systems and practices can expand opportunities for players to be recognized and emerge as talented athletes (beyond the standard models of talent identification and development available to athletes in elite sport) (Bjørndal & Ronglan, 2019).

Concluding thoughts

The aim of this case study was to explore how coaches of national Norwegian youth ice hockey teams identify and evaluate sporting talent within these structured settings. The findings of this study indicate that talent identification and evaluation can be interpreted and conceptualized as personal, deeply embodied, contextualized, and enculturated value-judgments that influence and facilitate the possibility of future success. From both an onto-epistemological and policy perspective, the current objectification and standardization of talent identification is inadequate. A departure is needed from the positivist underpinnings that inform so much contemporary research and practice in talent identification and development. We recognise that individual bias and preferences affect decision-making, but we believe that recognizing and understanding the ecological and subjective nature of talent identification and evaluation can lead to better-informed decision-making. All talent identification and development processes in youth sports are inherently uncertain and unpredictable, and talent identification consists of intricate and sometimes improvised processes. It therefore cannot, and should not, be rigidly defined or prescriptive. Talent identification and evaluation is relational, contextual, and

constantly contested. Future research and practice should seek to embrace this uncertainty as an onto-epistemological starting point.

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Table 1. Vignettes

Markus	
Date of birth:	March 2, 2005
Height:	5 ft 7 in (171 cm)
Weight:	154 lb (70 kg)
Position:	Offence
<p>Markus is a fast, explosive, and creative left winger with a good, precise shot. He is a natural goal scorer with his offensive instincts, but not as dominant in the game without the puck. At a young age, he also stood out on the football and athletics field, but quit those sports in the 5th grade in favour of ice hockey. He has been at the forefront of development all the way, and has mostly played with players who are 1-2 years older. It's through sports and ice hockey that he has experienced a sense of achievement and has, so far, met little resistance in these contexts. Off the ice, however, he has his challenges, especially at school where he rarely shows up. In the last year, he has also made new friends outside the ice hockey community who have started partying on the weekends.</p>	
Ulrik	
Date of birth:	January 10, 2005
Height:	6 ft 1 in (186 cm)
Weight:	187 lb (85 kg)
Position:	Defence
<p>Ulrik is a big and strong defender, who is tough to meet anywhere on the ice. He prefers to play physically, and, with his sacrificial style of play, he is a natural leader in the team. He has good first passes and likes to transit the puck straight to the offensive zone. Since he is neither very fast nor agile on the skates, he tends to take penalty minutes when he meets more mobile opponents. In addition to his play on the ice, Ulrik plays basketball where he is also on the regional team and a drummer in a rock band with some classmates.</p>	
Jonas	
Date of birth:	July 27, 2005
Height:	5 ft 6 in (167 cm)
Weight:	143 lb (65 kg)
Position:	Offence
<p>Jonas is a smart centre who often thinks two steps ahead of the rest, and his game intelligence makes him a constant offensive threat every time he is on the ice. He is a mobile skater but can develop more strength and power to increase his speed. He likes to take responsibility but expects to get something back in return. In the heat of the game, he can scold both teammates and referees. He is dedicated and playful on ice but not as enthusiastic about office training. Both Jonas and his brother, who is two year older, have spent many hours in the rink with their father who is a former elite player. Today, the father is a coach for a team at the senior level and supports the brothers closely.</p>	
Daniel	
Date of birth:	December 9, 2005
Height:	5 ft 2 in (158 cm)

Weight: 112 lb (51 kg)

Position: Defence

Daniel is a curious and training-minded player. He's first on the ice and gives 100 percent both on and off the ice. He spreads joy and is a well-liked character in the team. He was first introduced to ice hockey by a classmate in the 3rd grade and from there been completely "saved". Previously, he performed figure skating and brought some of the balance and control that make him a good skater. However, he is not very fast or strong on the puck and struggles especially with the physical part of the game in front of goal and along the boards. Daniel has supportive and committed parents but neither of them has been active in sports.

Appendix A: Interview guide

Question	Probes/stimuli	Purpose
Please tell me about yourself and your athletic and coaching background.	Age, education, occupation, ...? Different sports, levels, ages ...?	Establish relation with coaches, and place responses in context.
How and when did you get in to coaching?	Length and experiences of coaching? Formal or non-formal coaching education? Role, length of time, ...?	
Who are you coaching today?		
Section 1: Understanding on concept of talent and TID		
What does the term “ice hockey talent” mean to you?	Special traits/characteristics? Mental picture? Static/dynamic/combination?	Definition and understanding of talent and talent identification and development
What does the term “talent identification” mean to you?	What is the aim of the process? Why do we want to identify talented players?	
How far in advance (realistically) can we identify talent?	Ages? Possible/warranty? Differences between current and future potential?	
Section 2: Coaches’ TID practice		
How do you identify a talented ice hockey player?	Procedure/practice/criteria? Important tools/measurements? What are you looking for? How long do you prefer to see/follow players? Which context?	Current use of methods in talent identification and development
Which factors, skills, traits, criteria(s) do you assess/emphasize in talent identification and development?	Physical, phycological, technical, tactical, psychosocial, ..., other? Does this change? Flexible? Context dependent?	
Of those “factors” that we’ve talked about, can you rank them in terms of future predicted talent?	Examples? Success/mistakes? Pressure? Competition? Sports evolving? Perfect player in 2020 v. 2035?	Ranking different factors, and nuances in talent identification and development
How would you assess the relevance of previous experience from talent identification and development /similar situations to identify talent?	Can you pinpoint what it was that made you think/feel that? What set him apart from other players? Difference between a good and great player? True for everybody all time?	
What challenges do you experiences in the talent		Importance of experiences, knowledge, and instinct
		Examples for further insight

identification and development process?	Please pinpoint why this is crucial? Examples?	
Can you give an example of a player you knew/felt would succeed?	Please pinpoint why it's not worth it? Examples?	Non-negotiables predicting talent
What characterizes a player with the potential to become a professional?		Deal-breakers predicting talent
Is there anything "special", no matter how good a player is in other areas: if he doesn't have "X" he won't succeed?		
And the opposite: are there any "red flags", such as if the players have "Y", then it's a "no-go"?		

Section 3: Vignettes

What are your immediate thoughts and assessments of the players?	Traits that correspond with "real life" experience? What point for and/or against to succeed long-term?	Understanding, decision-making and assessments of the vignettes
Which of the players do you believe has the greatest potential to succeed in 10 years	Why/why not - <i>Markus, Ulrik, Jonas</i> or <i>Daniel</i> ? Please pinpoint/justify ...	

Rounding

Finally, is there something you would like to add?	Other interesting aspects related to the talent identification and development process we don't have touched?	Summarize and thank the coaches for sharing their thoughts and experiences
Other questions to the project?		

Appendix B: Example of interview coding

Meaning unit	Code	Category	Theme
It is almost as simple as “the more I see and observe, the better”. It is all about observing the player as much as possible in different contexts (Coach 3).	Observations	Coaches’ eye	Embodied
It all depends on what type of player it is. There are so many different skills and qualities that are required to succeed (Coach 6).	It depends	Evaluations	Embedded
The player must love to work hard over time. I do not believe you can succeed in anything without this will and dedication (Coach 8).	Hard work and character	Psychosocial factors	Enculturated
There is a lot that can happen along the way. Some may develop a taste for blood along the way, while others lack the drive to step on the pedal and drop out (Coach 2).	Different scenarios	Unpredictability	Enabling