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the exemplar case of British Rugby League Football**

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Principles to Guide Talent Development Practices in Sport: The Exemplar Case of British Rugby League Football

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Abstract

The value of talent development programs, aimed at nurturing children and adolescents into high performance sport, has been widely questioned. However, there seems to be some agreement that the general concept of talent development is not the issue; rather, the problems exist in the design, implementation, and management of these systems. These challenges were exemplified in 2021 across British Rugby League Football, where the academy system came under scrutiny from the National Governing Body and many commentators from within the sport. In this paper, we argue that without a theoretical framework to guide learning in development, further operational guidance will continue to foster many of the practices that lead to criticism within the academic literature and from key stakeholders. Situated within the theoretical framework of ecological dynamics, we propose six principles to guide talent development practices of youth athletes: (1) *non-linear development of athletes*; (2) *academies that are development focused, not performance driven*; (3) *importance of generality and specificity of practice in athlete development*; (4) *implementation of contemporary pedagogical models*; (5) *skilled intentionality*; (6) *an ethos of amateurism in a professional academy*. We encourage practitioners to consider implementing these principles to realign talent development programs, thereby supporting fun, collaboration, inclusion, and a long-term enjoyment of movement and sports participation.

Keywords

Talent development, athlete development, ecological dynamics, learning in development

Introduction

In 2021, the Rugby Football League reduced the number of talent development academies that receive elite status (Rugby Football League, 2021). The decision by the National Governing Body of the sport caused a fierce debate between stakeholders and raised questions about

the effectiveness of rugby league academies in supporting participation and development. The questions were framed around the impact of the current academy structure on (1) diminishing participation numbers within the amateur game, (2) children dropping out of the sport while still in their teenage years, and (3) a sense that

professionalism was affecting children's fun and enjoyment (O'Connor, 2021). While the number of academies to receive elite status was later increased, the situation highlighted a wider issue with talent development practices and pathways globally.

Rongen et al. (2018) questioned the necessity and healthiness of talent identification and development systems (TIDS), arguing that the general concept is not the issue, rather, the design, implementation, and management of these systems is the problem for youth athletes. This point also aligns with the views of professional coaches working in elite levels of sport, who have criticized academies for being overly structured, leading to *player indoctrination* into systematized ways of performing that hinder development (e.g., Ryan, 2016; Pryce, 2018). For example, British Diving's Single System promotes a technical blueprint of optimum movement techniques that are measured through decontextualised criteria. Such approaches often ignore the importance of developing athletes' functionality to satisfy the range of constraints that impinge on their development (e.g., Rothwell et al., 2020). To overcome the operational challenges associated with poorly performing TIDS, Rongen et al. (2018) suggested that a "Deliberately Developmental Organization" (DDO) approach can enhance positive athlete development practices (the concept of DDO's from the business field adopts an organizational culture that supports individuals personal and professional growth). While we agree that current approaches need overhauling, the DDO and other operational concepts lack a theoretical framework to guide learning and development. Without theoretical grounding, such programs could inadvertently lead to further enculturation of athlete developmental practices that adopt decontextualized learning approaches. The aim of such approaches would be to enrich internalized representations between the brain and the goal to be achieved (e.g., Schmidt & Wrisberg, 2004).

In this opinion piece, we suggest that an ecological dynamics perspective on talent development can realign the focus of such

pathways and enhance youth athlete's learning in development. Ecological dynamics (the combination of ecological psychology and dynamical systems theory) is a relevant framework to guide the investigation and implementation of talent development pathways because a central theme of ecological science is to understand factors that enrich interactions between the athlete-environment system (e.g., Davids et al., 2015). Based on these assumptions, an individual's journey to elite performance is considered dynamic, constraint dependent, and a highly individualized phenomenon. As we expand on later, assumptions of ecological dynamics can explain how the multitude of constraints that athletes experience over the course of their development influence how they attune to key information sources to guide skilled action (Uehara et al., 2021). In attempts to bridge the gap between the rich theoretical concepts of ecological dynamics, we present six principles that we hope can help coaches and talent managers operationalize and guide talent development practices. We believe that these principles can support opportunities for a greater focus on fun, enjoyment, and pleasure in moving and playing sport throughout the lifespan.

Principles to Guide Talent Development Practices in Sport

Non-linear Development of Athletes

Acceptance that human behavior and development are non-linear means rejection of many taken-for-granted talent development practices that are implemented globally. For example, the early identification and recruitment of youth athletes into step-by-step or pyramid models of development are problematic (e.g., the standard model of talent development) because selection based on current anthropometric and physical capacities is not a prediction of performance potential (Lath et al., 2020). In addition, there is evidence to suggest that the non-linear nature of athlete development cannot be fully captured by staged models (e.g., Gulbin et al., 2013).

These issues are even more prominent in talent development programs and sports that are biased towards physical attributes where maturation and birth date influence selection inequalities known as relative age effects (RAEs) (Kelly et al., 2021). This is exemplified in rugby league, where intermittent high intensity efforts require players to possess high physiological capacities of speed, strength, power, and aerobic capacity (Till et al., 2017). Due to the physical requirements of the sport, there are clear maturation advantages in the youth game. Empirical data suggests that there is an over-representation of youth players born in the first quartile of the year (September to December) playing the sport, where RAEs increase with performance levels as selection for places decreases (Till et al., 2010).

The evidence of RAEs in the sport align with the argument of ex-Great Britain rugby league international Terry O'Connor (2021). He suggested that youth rugby league players should not be selected for an academy program until much later in their development. Cobley and Till (2017) also support this view in rugby league, highlighting that selection and differentiation biases present in player development systems are a factor in children's decision to drop out of the sport. To embrace the non-linear nature of human development and negate issues associated with RAEs in rugby league and sport more generally, it would seem sensible to delay selection and develop alternative participation strategies to cater to children who are yet to reach advanced stages of maturation. Accordingly, we next discuss the value of focusing on development, not performance, within talent development academies.

Academies That Are Development Focused, Not Performance Driven

Given the argument for delayed pressures for specialization and professionalization in youth sports, a fundamental differentiation must be made between environments with a *development focus*, and those with a short-term, results-oriented *performance focus* (Rothwell et al., 2018). Certainly, senior professional Super

League teams will go through performance-oriented and results-driven phases over the course of a competitive season (e.g., a “win at all costs” approach to preparation and training that lead to a Grand Final play-off game). But should this focus on optimized temporary performances and results transfer to training methods and competition structures in youth sports?

Traditional talent development approaches confirm a performance driven view by underlining notions of early specialization, deliberate practice, monotonous rehearsal of movement skills, and structured play (Ribeiro et al., 2021). Here, explanations for talent selection and predicted future performances are sought through linear models of learning that neglect the influence of environmental constraints on an athlete's development (Araújo & Davids, 2011). In contrast, an ecological dynamics view of expertise in sport considers talented athletes as those who have developed a functional relationship between the constraints imposed by the environment and their own individual resources (Araújo et al., 2010). For example, Araújo and Davids (2018) illustration of Bob Beamon's 1968 world-record long jump highlighted how task (e.g., multiple sport experiences and regular intense competition with elite athletes), environment (e.g., wind speed and altitude), and individual constraints (e.g., personal dispositions) interacted to serve as boundaries to shape expert performance at a specific moment in time.

An ecological dynamics framework assists practitioners' understanding of non-linear learning processes that highlight the mutual relationship between the athlete-environment system (Otte et al., 2020). Considering this perspective, the focus of talent development environments should not be on results, short-term performances, and common performance metrics (e.g., scoring conversion rates). Rather, a development focus would embrace the notion of *athlete enrichment*. Enrichment activities facilitate movement exploration and skill adaptation in diverse (unstructured and structured) learning environments, aiming at general development of perceptual, cognitive

and movement abilities, and intrinsic enjoyment of moving (Ribeiro et al., 2021; Savelsbergh & Wormhoudt, 2018). Learning environments from an ecological perspective concern opportunities for athletes to adapt to varying constraints, as well as the functional coupling of perception and action (Araújo et al., 2010). Over time, the learning process aims to deepen and improve athletes' perceptual attunement to affordances (e.g., opportunities for action include the object of manipulation such as a ball, other players in the game, line and field markings, the playing surface or weather conditions) within an environment, and the goal-directed coordination of skilled movement (Button et al., 2021; Gibson, 1979).

Adopting an ecological view of talent means that developmental training should allow athletes to explore, encouraging them to *wayfind* through diverse and varying environments (i.e., the purposeful and intentional journey through a given landscape, such as a training or competition task; see Woods, Rudd, et al. (2020), for an introduction of the “wayfinding” concept). While athletes in most training tasks, independent of a developmental or performance focus, learn to solve emergent performance-related problems, a developmental training focus highlights the significance of self-organized exploration and discovery. In other terms, developmental training may differ from performance training, because athletes are encouraged to interact with their environments in various adaptive ways, where “it is the journey (e.g., freedom to explore and make mistakes) that is of relevance to a wayfinder, not just the arrival at a destination” (Ingold, 2002, in Woods, Rudd, et al., 2020, p. 3). As opposed to performance training which may aim to enhance athletes' exploitation of performance environments to achieve pre-planned (and often coach-led) outcomes, developmental training embeds athletes into an interactive process of exploring and “finding their way” through various landscapes (Woods, Rudd, et al., 2020).

This view stresses the importance of a collaborative approach between the athlete and coach to co-design learning environments (Woods, McKeown, et al., 2020). When athletes

and coaches work closely together, they can develop a better understanding of how task constraint manipulation can support skill adaptation, leading to athlete-environment-driven learning environments. This approach can lead to healthier, and more intrinsically motivated athletes, who can develop life-long enjoyment for problem solving and learning, while still improve game performances (McKay & O'Connor, 2018; O'Sullivan et al., 2021). For this reason, we present a simplified development formula that could guide coaches at all stages of development:

$$\begin{aligned} & \text{(Intrinsic) **Enjoyment + Learning**} \\ & \text{(in Enriched Environments) =} \\ & \text{Improved Development and Performance} \end{aligned}$$

The Importance of Generality and Specificity of Practice in Athlete Development

Athlete development in sports organizations and specialist academies needs to be better informed by contemporary theories of motor development and motor learning. Motor learning theories have traditionally over-focused on specificity of learning, partly contributing to a culture of early identification, selection, and specialization in sports organizations, clubs, and nations (Rothwell et al., 2020; Ribeiro et al., 2021). In traditional talent development programs, this performance-based culture leads to children (as young as 5 years of age in some cases) being treated as “mini-adults” (e.g., Ginsburg et al., 2006).

An ecological perspective endorses a more nuanced understanding between specificity and generality of practice in an *early diversification* framework for athlete development. Identification and selection of young children as “talented athletes” in a single sport is precarious due to the non-linearity of human development and learning discussed earlier (Button et al., 2021). Development of physical literacy through play and physical activities throughout childhood, involving multiple sports, can enrich later athletic performance (Rudd et al., 2021). A more generalized athletic foundation helps children develop their adaptability and general foundational skills, thus supporting specialized training later on in their development.

An ecological conceptualization of athlete development can re-shape the way coaches prepare athletes for the *messy noisiness of competition*, questioning the value of “over-planned” learning designs dominating many organizations. Traditional practice designs of youth sports place too much emphasis on the wrong sort of repetition (as orchestration and rehearsal), instead of “repetition without repetition,” which is associated with development of adaptive skills (Bernstein, 1967). Ecological dynamics conceptualizes sports performance as more adaptive and tightly synchronized with emerging undulations (i.e., changes in the task goal) of the dynamical performance landscape that exists in sports. These undulations can perturb emotions, cognition, perception, and actions in athletes. In competition, and due to personal circumstances (e.g., experience of growth spurts in adolescence), perturbations are guaranteed, which is why development programs should be designed to help athletes cope with such problems and challenges as they emerge (young athletes may need to refine previously learned skills due to maturation). In development sports programs, a greater emphasis is needed on skill adaptation and self-regulation, always involving deeply intertwined cognition, action, and perception. When pre-planned actions do not work in performance, athletes need to be prepared to adapt their intentions, using perception and action to self-regulate in dynamic environments. If they are trained using only playbooks, manuals, and game models, skills development may not be optimized. Next, we discuss contemporary pedagogical frameworks that can help coaches operationalise the points discussed so far.

Implementation of Contemporary Pedagogical Models

Coaches typically report a culture of traditional linear methods of learning within their sports (Stone et al., 2020; Anderson et al., 2021). However, in attempts to establish a more nuanced understanding of learning designs, recent work informed by ecological dynamics theory has transitioned toward a deeper

integration of empirical and experimental knowledge (e.g., Stone et al., 2020). This integration of knowledge has enabled theoretical ideas of ecological dynamics to be applied to practitioner models of athlete development, such as Nonlinear Pedagogy (NLP) (Chow et al., 2011), and the Athletic Skills Model (ASM) (Wormhoudt et al., 2018).

NLP provides an “explore-discover-adapt” approach to learning via the application of five learner-centered principles (representativeness, constraints manipulation, task simplification, informational constraints, and functional variability), which emphasize co-designed learning environments, which support the emergence of functional goal-directed behaviors in performers at all skill levels (Renshaw & Chow, 2019). These principles of NLP are aligned with central ideas of skill development and learning in the ASM (Rudd et al., 2021).

The ASM is a concentric, skill-centered approach to athlete development which emphasizes enriching an athlete’s basic movement skills (Wormhoudt et al., 2018; Savelsbergh & Wormhoudt, 2018). The ASM proposes to negate the issues of early specialization, arguing that practice in youth sport programs should be (re)designed to include experience of various physical activities, which cultivate athletic skill development through exploratory practice and guided discovery (Wormhoudt et al., 2018). Here, the emphasis is not on the development of the target sport specific skills, but rather developing well-rounded athletic individuals. This approach to skill learning requires a careful and continuous transition between generality (non-target sports and activities) and specificity (engaging with various forms of a target sport) of transfer (Travassos et al., 2018).

Skilled Intentionality

As we discussed in the section titled “Academies That Are Development Focused, Not Performance Driven,” an ecological dynamics perspective of skilled behavior is based upon the fundamental idea that direct perception means the pick-up of ecological information presented by the environment

(Gibson, 1979; Lobo et al., 2018; Raja, 2018; Adolph, 2019). In dynamic sport contexts, such as rugby league, athletes are presented with a rich landscape of action possibilities and therefore need to develop the capacities to perceive and act upon relevant information to guide highly skilled actions (Araújo et al., 2019). The phenomenological concept of skilled intentionality captures this challenge and refers to an individual's "tendency toward an optimal grip on a situation by being selectively responsive to available affordances" (Bruineberg & Rietveld, 2014, p. 3). As the athlete-environment relationship strengthens, athletes become more attuned to relevant sources of information that specify goals to be achieved. By way of example, we share the insights of former Great Britain rugby league player, Sean Long (Bazeley, 2021):

No one told me how they were going to defend; no one told me who the spot players [defenders to target when in possession of the ball] were. I just picked it up [relevant sources of information] as I was feeling the game, so as I was playing, I felt the game. I felt, oh, they're more aggressive on this side. I need to play a bit earlier. Oh, these forwards are getting a little bit tired. I'll have to start taking them on.

Sean Long's insights exemplify how skilled intentionality is not a disposition, or trait, but rather a relational fit between an athlete's action capabilities and their selective openness to the multitude of relevant affordances (Araújo & Davids, 2011). Within this principle we suggest that coaches adopt a training intentionality that accounts for key constraints on performance, affording athletes' new invitations for action and thereby revealing new information to explore suitable movement behaviors (Araújo et al., 2009; Gibson, 1988). It is important for a coach to remember that an individual's intentionality is intimate and specific to the interacting (personal, task and environmental) constraints of specific performance contexts. This provides athletes with a unique value and meaning through exploration due to emergent affordance

utilization. Coaches should be mindful that they can interfere with this process if they over constrain athletes through the overuse of direct instruction and repetitive activities that aim to develop optimal techniques and that reduce opportunities to pick-up variable ecological information. Thus, an overly constrained pedagogical approach risks de-contextualizing the actions of the individual from their performance environment and uncoupling perception from action (Rothwell et al., 2022). What this coach-driven behavior inadvertently then puts at risk, is the individual's passion, excitement, and love of playing the game, which leads us to the last principle.

An Ethos of Amateurism in a Professional Academy

An amateur is an individual "who studies a subject *for the love of it*, motivated by a sense of *care and affection, personal involvement and responsibility*" (Ingold, 2021, p. 155, our emphasis). This is contrary to contemporary perspectives, which tend to view amateurism as less desirable to professionalism (Alberti, 2001). Perhaps this is because professionals are seen as "experts," working within predetermined rules and regulations, established by disciplines and academies (Said, 1994). Amateurs are seen as "novices" undertaking hobbies as a pastime and removed from the established conventions of their professional counterparts. Given its connotations of expertise, professionalism is typically associated with "specialism," where individuals market a product (or perhaps themselves) based on objective performance metrics, which are continually assessed and ranked against competitors (Said, 1994).

Manifest in sport, the race to professionalize talent development academies appears to directly counter the very foundations of amateurism, with the love of playing, exploring one's action capabilities, and expressing creativity and individuality all being risked in the process (Rothwell et al., 2020; Vaughan et al., 2019). For example, in interviewing ex-participants of a professional rugby league academy, Rothwell et al. (2020) noted that dropout was associated with experiences of

conformity, underpinned by imposed “professional” standards of behavior:

I suppose there is a lot more pressure to train in a certain way when you are with a *professional* side, obviously, but if you are at an *amateur* club you can try and do things [...] I could throw a really long pass and no one would bat an eyelid, but if I tried that in training for [professional academy] I’d be obviously told off for it.” (p. 9, our emphasis)

To us, it is an uncomfortable prospect that players (in all sports but emphasized here in rugby league) would leave a game they previously loved playing – *as an amateur* – because of a growing trend to professionalize behavior. To mitigate this growing professionalization in the academy, we introduce three characteristics of an ethos of amateurism that talent development academies could situate at their core:

1. **An amateur’s inquiry is not bound by disciplined conventions or paradigms, but by their love of “it”** (Masschelein & Simons, 2013). An ethos of amateurism could liberate coaches, players and other support staff from the sociocultural constraints that impose pre-determined “methodologies”—driving conformity—within an academy. This would prioritize coach and player experiential knowledge, promoting exploration, collaboration, inclusion, and humility.
2. **An amateur is not as concerned with conforming to desired competencies or professional benchmarks** (Masschelein & Simons, 2013). This idea links back to our second principle, where performance—of players, coaches, and other stakeholders—is not judged relative to metrics or “text-book” competencies in a list. What is instead prioritized is their intrinsic motivation levels or love for the game and the preservation and growth of their experiential knowledge. This approach to learning and development is aligned with an ecological dynamic’s rationale for skill adaptation, with athletes continually being challenged to search and

explore ways in practice to develop and adapt their skills and self-regulate their performance in competition while maintaining healthy relationships with all active participants in the team (Ribeiro et al., 2021).

3. **An amateur does not work to “produce” and is not “demand driven”** (Masschelein & Simons, 2013). This alleviates the pressure of accountability within the sporting academy—meaning coaches would not have to justify behavior relative to objectives that promote production. In other words, the outcome or success of the academy is not based on the number of players who “progress” into elite organizations later in life. What this would risk is a culture of marketization and conformity, where the coach submits to an accountable way of doing, viewing athletes as commodities “owned” by the organization, perhaps assuming “an attitude focused exclusively on results, growth and profit – and to continually justify actions in this regard” (Masschelein & Simons, 2013, p. 122).

Future Directions

The aim of this position paper was to provide principles to guide talent development practices and to realign the focus of talent pathways promoting better outcomes for youth athletes’ well-being and development. Contemporary applied scientific ideas in learning and development can promote positive academy experiences and enhance youth athlete’s experiences of formalized talent programs. We agree with Cobley and Till (2017) that structural (e.g., selection age) and operational (e.g., better training for academy coaches to differentiating between performance and development) change is needed for talent development programs to operate more effectively. Thus, it is our belief that the six principles offered here can guide any such future changes at macro and micro levels. Forthcoming work could seek to monitor and evaluate the challenges and opportunities to implementing changes to talent development programs, highlighting potential constraints on future programs that aim to address many of the

issues experienced in existing talent development pathways.

Authors' Declarations

The authors declare that there are no personal or financial conflicts of interest regarding the research in this article.

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