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Examining European Talent Development Environments: Athlete, Parent and Coach Perceptions

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ABSTRACT

Talent Development Environments (TDEs) aim to provide the appropriate conditions for youth athletes to realise their full sporting potential. How TDEs are designed and operated is therefore of great importance for the development of elite athletes. Stakeholders are vital in this process, yet their perspectives are poorly understood. This study assessed the quality of TDEs across 5 European countries, comparing athlete, parent and coach perceptions. A total of 571 athletes (Mean age = 15.2 ± 1.5 years), 759 parents and 134 coaches were recruited from TDEs across 27 sports. Participants completed the Talent Development Environment Questionnaire-5 or adapted versions. Overall, perceptions of European TDEs were positive. Coaches reported higher perceptions of TDE quality compared to athletes and parents, athletes reported marginally higher perceptions compared to parents. Across stakeholders, Long-Term Development was highest rated, followed by Communication. Support Network was lowest rated. Stakeholder perceptions varied most for the Holistic Quality Preparation subscale, highlighting perceived differences in TDE support for rounded athlete development. From an organisational perspective, identified strengths and weaknesses provide direction to coach and parent education. Practically, TDE leaders should consider how they can refine stakeholder coordination through integrating stakeholder perceptions as valuable feedback into their environment, especially for intangible factors.

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Introduction

There are high demands on talent identification and development systems to find and produce future elite athletes (Till & Baker, 2020). As the professionalisation and commercialisation of sport intensifies, national governing bodies of sport, clubs, and even governments, have put in place talent development environments (TDEs) to systematically support young individuals (Cobley et al., 2021; Williams et al., 2020). TDEs are the physical and social milieus where youth athletes engage regularly in organised learning and training practices, targeted to support their pursuit of excellence (Durand-Bush & Salmela, 2001). Alfermann and Stambulova (2007) suggest effective TDEs are those which support youth athletes to transition to the next level of development and/or performance towards the elite level. The optimal state and operation of these environments is vital to the continued supply of capable and healthy individuals to the world stage (Till & Baker, 2020).

Effective Talent Development Environments

Martindale et al.'s review (2005) identified five environmental features which make up an effective TDE. These include (1) long-term aims and methods, (2) wide ranging coherent messages and support, (3) emphasis on appropriate development not early success, (4) individual and ongoing development and (5) an integrated, holistic and systematic approach. Building on

this research, Henriksen et al. (2010) emphasise the importance of social, relational ecological features for effective TDEs, such as the micro-macro context, organisational culture and the role and interaction of stakeholders. Although these features were initially identified through a systematic review of the literature, coach perceptions (Martindale et al., 2005; Martindale et al., 2007) and ethnographic studies of effective environments (Henriksen et al., 2010), a significant amount of subsequent research has focused on exploring athlete perceptions of the quality of their TDEs in relation to these features.

The Talent Development Environment Questionnaire

The Talent Development Environment Questionnaire (TDEQ; Martindale et al., 2010) has been a popular tool for examining athlete perceptions. This psychometric scale was developed from Martindale et al.'s (2005, 2007) research on effective TDEs, providing a view of TDE quality based on the features outlined above. The scale has continued to be developed to improve its psychometric properties (e.g., Martindale et al., 2013). The "TDEQ-5" is the most recent and commonly deployed version (Li et al., 2015).

Research using the TDEQ has found that athletes consistently rate long-term development processes as a strength, characterised by a focus on training, progress and goal setting (e.g., Gledhill & Harwood, 2019; Li et al., 2017). Conversely, TDE

aspects relating to holistic development have been consistently perceived as relatively weak across a range of studies. The subscale measuring this factor is characterised by low coach concern for wellbeing, life outside of sport and training-competition balance (e.g., Curran et al., 2021; Mills et al., 2014; Thomas et al., 2020).

For athletes, perceptions of TDE quality also seem to matter, as those athletes that rated their environment as higher quality also reported more beneficial psycho-social health and wellbeing outcomes. Ivarsson et al. (2015) found that athletes in Swedish football academies who perceived their TDE as higher quality reported higher wellbeing. A high-quality TDE was identified as having a long-term development focus, a well-established support network with strong relationships and shared values between stakeholders, and good coach-player communication. Similarly, in a study of Caribbean track and field athletes, Thomas et al. (2020) found a positive and negative association between TDE perceptions and wellbeing and burnout respectively. Li et al. (2017) also reported that a long-term development focus, holistic quality preparation and good communication positively predicted basic needs satisfaction, which in turn predicted burnout.

From a sample perspective, a large proportion of TDE research has been conducted in single club or pathway settings, specifically in the context of Western elite football academies (e.g., Gledhill & Harwood, 2019; Mills et al., 2014; Mitchell et al., 2021) and Asian talent programmes (e.g., Li et al., 2019, 2018, 2017). Therefore, the generalisability of the research may be limited by the unique cultural characteristics of those settings (e.g., high financial investment, intensity and training load; Bonal et al., 2020; Nesti & Sulley, 2014). Currently, for TDEs outside the two dominant contexts, there is limited insight into strengths and weaknesses of practice and therefore how they may be improved. Enhanced understanding of TDE quality may also allow coaches and practitioners to monitor and promote athlete health and wellbeing more effectively (Rongen et al., 2018), given established links (e.g., Ivarsson et al., 2015).

Role of Stakeholders

Coaches and parents are seen as the most proximal and significant stakeholders to directly affect talent development (Bloom, 1985). Central to a coach's responsibility is that as the "architects of the sport environment" (Rynne et al., 2017, p. 287). Their roles might include the sharing of expertise, implementing effective methods and pedagogy, fostering positive athlete relationships, managing long-term goals and overseeing overall support and development (Bloom, 1985; Lara-Bercial & McKenna, 2018, 2022a, 2022b; Martindale et al., 2007). How coaches therefore assess and make decisions in the environment can have significant impacts for athletes (Lyle & Muir, 2020; Till et al., 2019). However, in practice coaches don't always do what they espouse (Partington & Cushion, 2013), or know what they do (Light, 2008). Therefore, examining coach perceptions could provide valuable insight to highlight discrepancies in practice quality, when compared to other stakeholders.

Parents can also be positive assets to their child's development (Côté et al., 2014), in what is largely a support role (e.g., emotional, esteem, informational and tangible; Rees & Hardy, 2000). However, sport parenting is complex and challenging (Wolfenden & Holt, 2005). Parents can be a source of added pressure for youth athletes (Lauer et al., 2010), and their over involvement can limit athlete responsibility and decision-making (Henriksen et al., 2010). Their positive contribution is largely determined by their knowledge, experiences and attitudes of being a sporting parent (Harwood & Knight, 2015). Given the active role parents have, how they perceive the TDE will likely affect their and their child's involvement (Clarke & Harwood, 2014).

Stakeholders such as coaches and parents, and indeed athletes themselves, must work together towards the goals of the TDEs. Henriksen and Stambulova (2017, p. 281) describe this coordination between stakeholders as an "Integration of Efforts", the harmony between stakeholders' knowledge, perceptions and behaviours (Taylor & Collins, 2021). Strong integration of efforts can drive coordination of practice across the TDE, such as the reproduction of agreed coaching approaches, sharing of congruent messages and the reinforcement of stakeholder decisions (Pankhurst et al., 2013). Inaccurate communication, a lack of role clarity and the offering of contradictory advice may result from stakeholders not working in synergy (Curran et al., 2021; Sweeney et al., 2022; Taylor & Collins, 2021). Coordination may be encouraged through clear and promoted TDE philosophies (Martindale et al., 2005). For example, through the creation of shared mental models (Taylor & Collins, 2020) or top-down organisational strategies (Mills et al., 2014) that set out the ethos and values of the TDE, which stakeholders work towards, driving alignment in practice. However, TDE coherence does not develop organically, requiring the development of these philosophies and for stakeholders to actively pursue alignment towards them (Henriksen et al., 2010).

A significant proportion of what is known about effective TDEs has come about through exploring athlete perceptions (Gledhill et al., 2017). Few studies have examined effective TDEs from the coach's perspective (e.g., Martindale et al., 2007), and to our knowledge, no research has examined effective TDEs from the parent's perspective. Exploring multi-stakeholder perspectives will allow a better understanding of the similarities/differences and strengths/weaknesses across perspectives, this advances opportunities to develop TDEs. This information may provide direction to those operating TDEs and coach and parent education in this region, showing what could be prioritised for improvement, helping streamline resource allocation. For example, practitioners and researchers could develop strategies that look to improve stakeholder coordination within TDEs, so they operate with more synergy.

The Current Study

Considering the current conditions of TDE research, two areas of limitation stand out. First, a significant proportion of the current evidence is based on relatively small sample single club or pathway case studies. As such, there is a scarcity of

research assessing the qualities of TDEs across a broader sample of environments. Secondly, despite the known importance of stakeholder coordination, there is limited research representing multiple voices in the TDE. To this end, the first aim of this study was to assess athlete, coach and parent perceptions of TDE quality across a diverse sample of European countries and sports. The secondary aim was then to compare the perceptions of these TDEs between athlete, parent and coach stakeholders.

Methods

Study Design

This research is rooted in a pragmatically oriented approach, guided by the applied focus of ICOACHKIDS PLUS, an Erasmus+ co-funded research project. A quantitative cross-sectional design, and exploratory and descriptive stance were taken to align with the study aims to examine stakeholder perceptions across a wide range of TDEs.

Procedure

Ethical approval was granted through the university's ethics committee (approval number: 77,571). In total, 5 sporting or educational organisations across 5 countries (Belgium, Hungary, Ireland, Lithuania and the United Kingdom) acted as gatekeepers to facilitate the recruitment and survey distribution within their countries using purposive sampling. The sampling strategy was chosen to ensure the sample reflected the targeted population of talented athletes, parents and coaches, within TDEs, as determined by the study aims (Punch, 2014). The gatekeepers of each TDE were tasked to distribute the survey to athletes, parents and coaches. Gatekeepers completed consent forms and participants provided informed consent or assent before data collection. For athletes below 16 years of age, parents completed the survey first and provided consent for their child to take part, before forwarding the athlete survey to them. The survey was hosted on QualtricsXM (2021). The survey included the participant information sheet, consent form, a series of training-based questions, and the TDEQ-5 (see below). The data collection period ran from March 2021 to October 2021 on a continuous recruitment basis, until all recruitment options had been exploited. This timeframe was selected to maximise the sample size within the time boundaries of the ICOACHKIDS project. Participants were given 14-days to complete the survey with a 10-day reminder. Participants were also assured of anonymity and confidentiality and asked to answer the survey honestly reflecting on their whole time in their TDE. Within the information sheet, coaches were reassured of the exploratory focus of this research to encourage them to answer as honestly as possible, language associated with "evaluation" was therefore avoided.

Participants

Gatekeepers led the recruitment in their own country. First, suitable TDEs were identified. Eligibility criteria were designed to ensure all selected programmes met the minimum

requirement to be considered as a TDE: 1. The TDE had a selection process (e.g., inclusion trial) in place for athletes to gain access, environments were excluded if they did not have any form of process that defined it as having a focus on a talented athlete population (Güllich, 2014); and 2. The TDE was positioned on a talent pathway aimed at facilitating the transition towards senior high performance. Environments were excluded if they were a standalone private or competitive club, without a development focus or if there was no clear "next stage" (Alfermann & Stambulova, 2007). The athlete, parent and coach population within suitable TDEs were deemed eligible participants and therefore were invited to take part in the study.

Participants included adolescent athletes aged 12–18 years ($n = 591$; Male = 417; Female = 165; Other = 9; (average displayed as, mean \pm standard deviation) age = 15.2 ± 1.5 years) and their parents or guardians ($n = 759$; Male = 336; Female = 412; Other = 11; age = 47.5 ± 5.6) and coaches ($n = 134$; Male = 116; Female = 17; Other = 1; age = 42.5 ± 11.8). Athletes were split in yearly age groups ranging from Under 13 to Under 19 (Under 13: $n = 45$; Under 14: $n = 90$; Under 15: $n = 170$; Under 16: $n = 101$; Under 17: $n = 78$; Under 18: $n = 74$; Under 19: $n = 33$). On average, athletes had been a member of their TDE for 4.5 ± 3.2 years and trained for an average of 11.9 ± 5.0 hours a week over 2.9 ± 1.6 days. Training included 6.1 ± 4.6 hours at their TDE and 5.8 ± 5.1 hours outside their TDE. Within the TDE, time was split between sport-based training (4.8 ± 3.7 hours), and strength and conditioning-based training (1.9 ± 3.7 hours). Coaches had varying roles (assistant coach = 17; coach = 50; lead/head coach = 44; director = 6; manager = 9; strength and conditioning = 8) and educational backgrounds (secondary (e.g., high school, further education) = 33; tertiary (e.g., university) = 60; masters = 36; PhD = 5), they had worked in their sport on average for 15.5 ± 9.9 years and 6.7 ± 7.47 years in their current TDE.

The sample came from 5 countries, geographically spread across Europe (Belgium, Hungary, Ireland, Lithuania, United Kingdom and Northern Ireland) and 27 sports. These include both individual (Boxing, Climbing, Cross Country, Fencing, Kayaking, Martial Arts, Skating, Skiing, Swimming, Track and Field Athletics, Wrestling) and team sports (Basketball, Camogie, Cheerleading, Cycling, Field Hockey, Football, Gaelic Football, Gymnastics, Handball, Hurling, Rugby League, Rugby Union, Table Tennis, Tennis, Volleyball, Water Polo). As the study aim was to assess TDEs across a wide sample and not compare between groups, there was no quota for recruiting a specific quantity of participants across countries or sports.

Measures

The TDEQ-5

The Talent Development Environment Questionnaire-5 was adopted for use by athletes. (TDEQ-5). The questionnaire was designed as a psychometric tool to assess athlete perceptions of the TDE, providing a rounded view of TDE quality (Li et al., 2015). Given the purpose of the scale, it was the most appropriate instrument for use, aligning to the aims of the study. The scale is comprised of 25 items across 5 subscales: (1) Long-Term Development (LTD) (5 items): "the extent to which

developmental programs are specifically designed to facilitate athletes' long-term success"; (2) Holistic Quality Preparation (HQP) (7 items): "the extent to which intervention programs are prepared both inside and outside of sports settings"; (3) Support Network (SN) (4 items): "the extent to which a coherent, approachable, and wide-ranging support network is available for the athlete in all areas"; (4) Communication (COM) (5 items): "the extent to which the coach communicates effectively with the athlete in both formal and informal settings"; (5) Alignment of Expectations (AoE) (4 items): "the extent to which goals for sport development are coherently set and aligned" (Li et al., 2015, p. 1839). The TDEQ-5 is considered a robust tool for use in practice and research, with established validity (Li et al., 2015), including use across a range of sample characteristics (e.g., country; Wang et al., 2016). It has also demonstrated adequate to excellent reliability (Li et al., 2015). The TDEQ-5 uses a 6-point Likert-type scale anchored with Strongly Disagree (1) and Strongly Agree (6).

TDEQ-5 Parent and Coach Versions

Currently, no tool exists to quantitatively measure parent or coach perceptions of TDEs in a way that is comparable to athletes. Therefore, given the previous validity of the TDEQ-5 (Li et al., 2015) and applied aspirations of the tool (Martindale et al., 2010), the scale was adapted to create parent (TDEQ-5P) and coach (TDEQ-5C) versions (see Supplementary Material). The scales were each adjusted to the subject of focus whilst reflecting the same content as the athlete version. The adaptation process was completed by two of the authors and then reviewed on an item-by-item level by the whole research team, all of whom are English-speaking and experienced in the use of scales. There were no disagreements within the author team regarding items or the re-wording that took place to change statements from an athlete-facing statement to a coach or parent-facing statement.

TDEQ-5 Translations

All the scales were translated into French, Dutch, Hungarian and Lithuanian, the spoken languages across the countries, for the purpose of this study and not future replication. The translation was overseen by the wider ICOACHKIDS project team, including at least three individuals per country. Members of this wider team were fluent in both their native language and English, and were experienced in translation having completed similar projects previously. A colleague from each country first forward translated the scale in direct reference to the English version, accounting for cultural nuances. In some cases, this was discussed with the authors to ensure accurate translation, who knew the original scale in detail. The translated version was then reviewed by the whole bilingual research team. Any points of difference were first deliberated and if necessary, a consensus vote was taken. Once a version was completed, the translated version was then backward reviewed. Through the review process, only minor grammatical, spelling and tone changes were made, for example, for the French athlete version (used in Belgium), to improve the flow of the statement but not alter the content, "est examinée" was replaced with "sont examinés". Once uploaded to the online survey platform, the

research team pilot tested the surveys to check for accuracy. These translation steps follow commonly used procedures (Ivarsson et al., 2015; Li et al., 2017).

Data Analysis

Validity and reliability checks were carried out first. Confirmatory factor analysis was conducted on the whole dataset (all groups) and each group's scale using SPSS AMOS (version 26; IBM) to examine scale factorial validity. This step provides reassurance of the model fit of the scales against the hypothesised Li et al. (2015) 5-factor scale. Several indices were used to assess model fit: chi-square fit statistic/degree of freedom (χ^2/df), comparative fit index (CFI), the standardised root mean square residual (SRMR), the root mean square error of approximation (RMSEA) and 90% confidence interval of RMSEA (Gallagher & Brown, 2013). Adequate model fit is subjectively interpreted from scores of χ^2/df below 5, CFI above 0.9 and SRMR, RMSEA and RMSEA 90% confidence interval below values of 0.08 (Brown, 2015). To test reliability, the internal consistency of the scale was examined using Cronbach alpha (α). The scale was assessed on the whole dataset and for each of the groups' scales. The lowest level of acceptance was set at $\alpha = 0.60$ with a very good score upwards of $\alpha = 0.80$ (DeVellis, 2016; Field, 2018).

Descriptive data analysis was carried out at two levels using SPSS (version 26; IBM). Negatively worded items were reversed, meaning favourability increased with mean scores for all items (Curran et al., 2021). First, data was analysed by item and subscale (Martindale et al., 2013). The means for each item and subscale were calculated for each stakeholder group. Secondly, an analysis of variance to compare stakeholders at subscale level was conducted. Data was not normally distributed so a Kruskal-Wallis test, a non-parametric alternative to ANOVAs which examines means across groups, was used. Statistical significance was set at 0.05, Bonferroni correction was applied to protect against type 1 error (Field, 2018).

Results

Validity and Reliability

Across the three scales, an identical adequate fit to the original model could not be found. Troublesome items (20 and 25) were subsequently removed and covariates added (item 4 and 5; item 7 and 8). Model fit was then re-examined and an overall acceptable model was found (Table 1). The modified 5 factor, 23 item model was thereafter used for analysis. Reliability checks of the modified scales were very good overall ($\alpha = 0.917$) and for athlete ($\alpha = 0.900$), parent ($\alpha = 0.933$) and coach ($\alpha = 0.858$) versions. All subscales were in the acceptance range ($\alpha = 0.614$ – 0.839) (DeVellis, 2016; Field, 2018).

Item and Subscale Analysis

Overall, TDE perceptions of the three stakeholder groups combined were positive, when using the Likert rating (1–6) as a point of interpretation. Item scores ranged from 3.14–5.22 (Table 2) and subscale scores ranged from 3.74–4.92 (Table 3). Item 1 (LTD; athlete: *My training is specifically designed to help*

Table 1. Validation results for TDEQ-5, TDEQ-5P, TDEQ-5C scales.

Indices	Athlete	Parent	Coach	Overall
χ^2	530.941	994.870	386.041	1052.141
<i>df</i>	218	218	218	218
χ^2/df	2.436	4.564	1.771	4.826
CFI	0.930	0.909	0.796	0.936
RMSEA	0.049	0.069	0.076	0.051
RMSEA (CI 90%)	0.044–0.054	0.064–0.073	0.064–0.088	0.048–0.054
SRMR	0.042	0.044	0.078	0.036

χ^2 = chi-square fit statistic, *df* = degrees of freedom, CFI = comparative fit index, RMSEA = root mean square error of approximation, CI = confidence interval, SRMR = standardised root mean square residual.

me develop effectively in the long term) was the highest rated individual item for the stakeholders together, followed by item 4 (LTD), 14 (COM), 5 (LTD) and 3 (LTD). In contrast, item 6 (AoE; athlete: *My coaches make time to talk to my parents about me and what I am trying to achieve*) was the lowest rated item for stakeholders, this was followed by item 24 (SN), 10 (AoE), 15 (HQP) and 23 (SN). Items (e.g., 1, 3, 14) relating to structured and tangible training and performance processes were higher rated. Items (e.g., 6, 10, 24) relating to social, relational and psycho-social processes were lower rated.

Across stakeholders, LTD was the highest ranked subscale, this was followed by COM, HQP, AoE and SN respectively (Table 3). When comparing subscales between stakeholders, coaches rated LTD, COM, HQP and SN significantly higher than athletes and parents respectively. Athletes rated HQP significantly higher than parents. No significant differences were found for AoE between stakeholders.

Discussion

This study aimed to assess athlete, coach and parent perceptions of European TDEs and compare stakeholder perceptions. This is the first study to examine TDEs across several countries and stakeholders, and the largest sample size in TDE research to date, advancing knowledge in this area. The results show the strengths and relative weaknesses of European TDEs, in general and from the perspective of three key stakeholders. Overall, European TDEs were perceived positively. LTD was the most positively rated subscale and SN was the most negatively perceived subscale. These results provide direction to TDE leaders looking to further optimise their environment and those who facilitate coach and parent education by highlighting where resources for improvement could be prioritised. The results also showed differences in how stakeholders rated TDEs. Coaches reported significantly higher perceptions than athletes and parents on all but one subscale (AoE). Athletes also reported higher perceptions than parents on all subscales, although this difference only reached statistical significance for the HQP scale. These results provide insight into stakeholder coordination within TDEs by illustrating how stakeholders may rate their environment differently, this gives direction to how coordination could be enhanced.

Quality of European TDEs

In line with previous research, LTD was the highest rated subscale overall and across stakeholders. This finding aligns with

previous research across a range of contexts, including Irish hockey (Curran et al., 2021), English football (Gledhill & Harwood, 2019; Mitchell et al., 2021) and Australian rugby league (Cupples et al., 2021). This strength is seen in qualitative research too, including practices such as the prioritisation of development over results (Henriksen et al., 2010) and the use of mistakes to improve (Ryom et al., 2020). These results are encouraging as a LTD-focused TDE positively predicts basic needs satisfaction (Li et al., 2019, 2017), and has been associated with lower burnout (Li et al., 2017; Thomas et al., 2020) and higher wellbeing (Ivarsson et al., 2015). Further, this study included a varied sample in the level of training hours compared to many previous studies. This characteristic not only suggests that LTD is a strength of European TDEs, but also an area which can be perceived as good quality, at many levels of TDE intensity. Therefore, generally across TDEs, optimising LTD practices may be considered an accessible opportunity enhance the environment, compared to other more resource driven factors (e.g., support staff). These practices could include coach use of learning focused language (Ryom et al., 2020), and planning strategies such as individual athlete development plans and long-medium-short term coach planning methods (Abraham & Collins, 2011).

Contrary to previous research (Curran et al., 2021; Li et al., 2019, 2018; Mitchell et al., 2021; Thomas et al., 2020), European TDEs were not perceived as scoring relatively low on HQP compared to other areas of the TDEQ-5. This subscale examines psycho-social processes (e.g., wellbeing, care for outside life, and development of mental toughness) and as such relates to athlete holistic care and development (Mitchell et al., 2021). These results may be explained by a training load effect. For example, Li et al. (2017) report an average of 10.6 hours of training a week and poorer HQP scores. Furthermore, Mitchell et al. (2021) found that across three football academies which typically train a similar amount at around 12 hrs a week, the high-tier football academy, which was characterised by increased support resources, reported significantly higher HQP scores. This finding perhaps suggests that HQP scores may be affected by training and mediated by athlete support resources. However, Curran et al. (2021) found no HQP variances between standards of play (school; club & international) and age groups (under 16; 18 & 21) across the female youth hockey pathway, even though these setting differences would normally be associated with a training load and intensity increase. The current study provides evidence towards the context dependent nature of HQP, and

Table 2. Item-level results for athlete, parent, coach and all group combined scales; data presented as mean \pm standard deviation.

Item	Subscale	Athlete	Parent	Coach	All Groups
1 A: My training is specifically designed to help me develop effectively in the long term P: My child's training is specifically designed to help them develop effectively in the long term C: My athletes' training is specifically designed to help them develop effectively in the long term	LTD	4.70 \pm 1.38	5.05 \pm 1.20	5.22 \pm 1.11	4.92 \pm 1.28
4 A: My coach allows me to learn through making my own mistakes P: My child's coach allows them to learn through making their own mistakes C: I allow my athletes to learn through making their own mistakes	LTD	4.86 \pm 1.17	4.54 \pm 1.29	4.90 \pm 1.12	4.70 \pm 1.24
14 A: My coach explains how my training and competition programme work together to help me develop P: My child's coach explains how the training and competition programme work together to help my child develop C: I explain to my athletes how the training and competition programme work together to help them develop	COM	4.43 \pm 1.43	4.57 \pm 1.39	5.16 \pm 1.13	4.57 \pm 1.40
5 A: I would be given good opportunities even if I experienced a dip in performance P: My child would be given good opportunities, even if they experienced a dip in performance C: My athletes would be given good opportunities, even if they experienced a dip in performance	LTD	4.46 \pm 1.39	4.52 \pm 1.37	4.81 \pm 1.05	4.52 \pm 1.36
3 A: I spend most of my time developing skills and attributes that my coach tells me I will need if I am to compete successfully at the top/professional level P: My child spends most of their time developing skills and attributes that their coach tells them they will need if they are to compete successfully at the top/professional level C: My athletes spend most of their time developing skills and attributes that I tell them they will need, if they are to compete successfully at the top/professional level	LTD	4.58 \pm 1.27	4.31 \pm 1.34	4.60 \pm 1.22	4.45 \pm 1.31
17 A: My coach rarely takes the time to talk to other coaches who work with me P: My child's coach rarely takes the time to talk to other coaches who work with my child C: I rarely take the time to talk to other coaches who work with my athletes	HQP	4.53 \pm 1.50	4.24 \pm 1.60	4.99 \pm 1.31	4.42 \pm 1.55
7 A: The advice my parents give me fits well with the advice I get from my coaches P: The advice I give my child fits well with the advice my child gets from their coaches C: The advice parents give my athletes fits well with the advice I give my athletes	AoE	4.43 \pm 1.31	4.58 \pm 1.29	3.40 \pm 1.30	4.42 \pm 1.34
2 A: My coach emphasizes that what I do in training and competition is far more important than winning. P: My child's coach emphasizes that what my child does in training and competition is far more important than winning C: I emphasize that what my athletes do in training and competition is far more important than winning	LTD	4.29 \pm 1.43	4.23 \pm 1.41	5.06 \pm 1.10	4.33 \pm 1.41
21 A: I am not taught that much about how to balance training, competing, and recovery P: My child is not taught that much about how to balance training, competing, and recovery C: My athletes are not taught that much about how to balance training, competing, and recovery	HQP	4.33 \pm 1.54	4.28 \pm 1.53	4.07 \pm 1.47	4.28 \pm 1.53
11 A: My coach and I regularly talk about things I need to do to progress to the top level in my sport (e.g., training ethos, competition performances, physically, mentally, technically, tactically) P: My child and their coach regularly talk about things that my child needs to do to progress to the top level in their sport (e.g., training ethos, competition performances, physically, mentally, technically, tactically) C: I regularly talk with my athletes about things that they need to do to progress to the top level in their sport (e.g., training ethos, competition performances, physically, mentally, technically, tactically)	COM	4.38 \pm 1.49	4.06 \pm 1.52	4.92 \pm 1.16	4.26 \pm 1.50
9 A: I am involved in most decisions about my sport development P: My child is involved in most decisions about their sport development C: My athletes are involved in most decisions about their sport development	AoE	4.58 \pm 1.34	4.00 \pm 1.58	3.88 \pm 1.21	4.22 \pm 1.49
16 A: My coach doesn't appear to be that interested in my life outside of sport P: My child's coach doesn't appear to be that interested in my child's life outside of sport C: I don't appear to be that interested in my athletes' life outside of sport	HQP	3.96 \pm 1.62	4.21 \pm 1.63	5.12 \pm 1.08	4.19 \pm 1.61
19 A: I am rarely encouraged to plan for how I would deal with things that might go wrong P: My child is rarely encouraged to plan for how they would deal with things that might go wrong C: My athletes are rarely encouraged to plan for how they would deal with things that might go wrong	HQP	4.05 \pm 1.53	4.01 \pm 1.51	4.39 \pm 1.43	4.06 \pm 1.51
13 A: My coach and I often try to identify what my next big test will be before it happens P: My child and their coach often try to identify what my child's next big test will be before it happens C: I often try to identify what my athletes' next big test will be before it happens	COM	3.99 \pm 1.55	4.00 \pm 1.44	4.65 \pm 1.23	4.06 \pm 1.48
8 A: My progress and personal performance is reviewed regularly on an individual basis P: My child's progress and personal performance is reviewed regularly on an individual basis C: I review my athletes' progress and personal performance regularly on an individual basis	AoE	3.92 \pm 1.51	3.94 \pm 1.56	4.30 \pm 1.38	3.96 \pm 1.53

(Continued)

Table 2. (Continued).

Item	Subscale	Athlete	Parent	Coach	All Groups
18 A: I don't get much help to develop my mental toughness in sport effectively P: My child doesn't get much help to develop their mental toughness in sport effectively C: My athletes don't get much help to develop their mental toughness in sport effectively	HQP	3.99 ± 1.63	3.88 ± 1.53	3.90 ± 1.47	3.93 ± 1.56
12 A: My coach and I talk about what current and/or past world-class performers did to be successful P: My child and their coach talk about what current and/or past world-class performers did to be successful C: I talk with my athletes about what current and/or past world-class performers did to be successful	COM	3.90 ± 1.59	3.79 ± 1.47	4.37 ± 1.26	3.89 ± 1.51
22 A: Currently, I have access to a variety of different types of professionals to help my sports development (e.g., physiotherapist, sport psychologist, strength trainer, nutritionist, lifestyle advisor) P: Currently, my child has access to a variety of different types of professionals to help their sports development (e.g., physiotherapist, sport psychologist, strength trainer, nutritionist, lifestyle advisor) C: Currently, my athletes have access to a variety of different types of professionals to help their sports development (e.g., physiotherapist, sport psychologist, strength trainer, nutritionist, lifestyle advisor)	SN	3.96 ± 1.75	3.50 ± 1.83	3.89 ± 1.86	3.72 ± 1.82
23 A: I can pop in to see my coach or other support staff whenever I need to (e.g., physiotherapist, psychologist, strength trainer, nutritionist, lifestyle advisor) P: My child can pop in to see their coach or other support staff whenever they need to (e.g., physiotherapist, psychologist, strength trainer, nutritionist, lifestyle advisor) C: My athletes can pop in to see me or their other support staff whenever they need to (e.g., physiotherapist, psychologist, strength trainer, nutritionist, lifestyle advisor)	SN	3.68 ± 1.75	3.56 ± 1.78	4.40 ± 1.56	3.68 ± 1.77
15 A: My coach rarely talks to me about my well-being P: My child's coach rarely talks to me about my child's well-being C: I rarely talk to parents about their child's well-being	HQP	4.05 ± 1.60	3.26 ± 1.76	4.21 ± 1.54	3.66 ± 1.73
10 A: I regularly set goals with my coach that are specific to my individual development P: My child regularly set goals with their coach that are specific to my child's individual development C: My athletes regularly set goals with me, that are specific to their individual development	AoE	3.46 ± 1.59	3.70 ± 1.55	4.02 ± 1.43	3.63 ± 1.56
24 A: My coaches talk regularly to the other people who support me in my sport about what I am trying to achieve (e.g., physiotherapist, sport psychologist, nutritionist, strength and conditioning coach, lifestyle advisor) P: My child's coaches talk regularly to the other people who support my child in their sport about what my child is trying to achieve (e.g., physiotherapist, sport psychologist, nutritionist, strength and conditioning coach, lifestyle advisor) C: I talk regularly to the other people who support my athletes in their sport, about what my athletes are trying to achieve (e.g., physiotherapist, sport psychologist, nutritionist, strength and conditioning coach, lifestyle advisor)	SN	3.22 ± 1.58	3.35 ± 1.54	3.94 ± 1.65	3.35 ± 1.57
6 A: My coaches make time to talk to my parents about me and what I am trying to achieve P: My child's coaches make time to talk to me about my child and what they are trying to achieve C: I make time to talk to parents about their children and what they are trying to achieve	AoE	3.17 ± 1.65	3.14 ± 1.64	3.88 ± 1.46	3.22 ± 1.64
All Items		4.13 ± 1.50	4.03 ± 1.51	4.44 ± 1.33	4.11 ± 1.51

A = athlete scale item, P = parent scale item, C = coach scale item, LTD = Long-Term Development, HQP = Holistic Quality Preparation, SN = Support Network, COM = Communication, AoE = Alignment of Expectations.

Table 3. Subscale-level analysis and analysis of variance results; data presented as mean ± standard deviation.

Subscale	Athlete	Parent	Coach	Total	Sig Dif. Between Groups
Long-term Development	4.58 ± 0.93	4.53 ± 0.99	4.92 ± 0.73	4.58 ± 0.95	Coach > Parent (p < .001); Coach > Athlete (p < .001)
Communication	4.18 ± 1.19	4.11 ± 1.17	4.78 ± 0.92	4.19 ± 1.17	Coach > Parent (p < .001); Coach > Athlete (p < .001)
Holistic Quality Preparation	4.15 ± 1.04	3.98 ± 1.12	4.45 ± 0.81	4.09 ± 1.07	Coach > Parent (p < .001); Coach > Athlete (p = .006); Athlete > Parent (p = .005)
Alignment of Expectations	3.91 ± 1.04	3.87 ± 1.19	3.90 ± 0.87	3.89 ± 1.11	No Significant Differences
Support Network	3.62 ± 1.37	3.47 ± 1.47	4.08 ± 1.36	3.59 ± 1.43	Coach > Parent (p < .001); Coach > Athlete (p = .001)

p = significance statistic, p < 0.05.

suggests the need for future research focused in this area, to unearth characteristics driving HQP quality. This information can then be used to further improve the holistic outcomes for athletes. For example, if training load is shown to be important, resources (e.g., time; money) could be invested into monitoring and adapting the appropriate competition and

training load for the physical and psychological stage of athletes (Pelka & Kellmann, 2017).

Current findings showed that the SN subscale (item 25 removed) was the lowest-ranked subscale. The subscale relates to athlete access to and coach communication with a multidisciplinary support team (e.g., physiotherapist, sport

psychologist, nutritionist, strength and conditioning coach, lifestyle advisors; Li et al., 2015). This support offers physical, emotional and psycho-social development services (Martindale et al., 2005). There are a few potential explanations for the findings. SN may hinge on financial resources, it is possible that some European TDEs may not have the investment to provide a SN (as measured in the subscale), resulting in a relatively low subscale score. De Bosscher and Rycke (2017) found significant differences in support services between countries, which they attribute to reasons such as national funding strategies. However, SN scores vary greatly in previous TDE research across a number of TDEs which are perhaps well financially resourced (English football academies (Mills et al., 2014; Mitchell et al., 2021), a specialised sport school (Li et al., 2017) and the Chinese sport institute (Li et al., 2019)). Low SN scores could be due to TDE leaders not seeing value in the provision of support, reflecting their knowledge and decisions around the level of investment in multidisciplinary staff or allocation of time in training schedules. From the athlete perspective, it is possible that they may struggle to access available support, due to, for example, insufficient social skills (Taylor & Collins, 2021). Thus far, debate around the use and optimisation of multidisciplinary support in TDEs has been scarce, this finding serves as a catalyst for future research in this area, which may seek to explore why SN is rated this way and how may it be improved.

Stakeholder Comparisons

By and large, coaches tended to rate the TDEs higher than athletes, and athletes rated them marginally higher than parents. The trend was consistent across items and subscales and may be attributed to several factors described in previous studies. First, in reference to higher coach scores, coaches may have a better understanding of their TDE and general talent development principles based on their knowledge and experiences as the “expert” and “architect”, compared with athletes and parents (Pankhurst et al., 2013). Coaches may therefore have a more global, long-term view of what makes a good development experience for their athletes. By contrast, athletes and parents may have a more short-term outlook. For example, when athletes and parents interpret challenging training or performance periods as negative, coaches may see these as beneficial to long-term success (Taylor & Collins, 2020). Athletes may begin to appreciate some of the benefits of their talent development retrospectively when acquired skills and attitudes become useful in later life (e.g., Lara-Bercial & McKenna, 2022a; Rongen et al., 2021). However, this finding may also hint at a coach social desirability bias. As Till et al. (2021, p. 15) explain: where “practitioners may perceive their practices are better than they actually are ... whereby individuals tend to present themselves in a favourable manner”. For coaches to be effective, they must make decisions based on the environment around them, for example, responding to interpersonal cues in coach-athlete interactions to gauge the level of stress an athlete may be experiencing (Jowett, 2017). As a strategy to overcome potential bias, coaches could consider reflective practices to improve self-awareness (Whitehead et al.,

2016). It would be worthy for future research to further explore the differences in perspectives between coach and athlete, and how improved awareness may optimise coordination/integration of efforts.

From the parent perspective, there are several possible explanations for the relatively low perceptions. Compared with athletes and coaches, parents are the ecological “outsider”, being more distal to the TDE (Henriksen et al., 2010). Quality and frequency of communication by TDEs is also a typical challenge for parents (Sweeney et al., 2022), Clarke et al. (2016) highlight how coaches purposefully keep parents at a distance and uninformed to prevent unhelpful interference. All these factors can result in less knowledge of the day-to-day activities in the TDE for parents, despite a desire to feel involved (Clarke & Harwood, 2014). What they do see and hear about in the TDE is likely critically judged in reference to only their child (Clarke & Harwood, 2014), whereas coaches assess the environment with respect to all the athletes in their care, against more expert knowledge in talent development (Pankhurst et al., 2013).

Regarding the discrepancies in the HQP subscale specifically, the largely intangible nature of processes relating to this subscale (Li et al., 2015), may make it difficult for parents to get a sense of quality. To understand largely subtle and invisible processes requires some understanding of related concepts (e.g., psycho-social skills), which some parents may struggle with (Dohme et al., 2021). Given the role parents and TDEs both have in the process of athlete psycho-social development and health (Harwood et al., 2019; Hill et al., 2016), it would seem important that both stakeholders are aligned for these to be optimised. Limited coherency would likely undermine TDE efforts (e.g., mixed messages; Martindale et al., 2005). Parents may have a strong sense of ownership in their child’s development in this area, as it relates to personal characteristics in and outside sport (Li et al., 2015). Therefore, TDEs may need to be both open to educating and listening to parents. For parents, having more accurate knowledge of the HQP processes that coaches and athletes engage in, may aid them in providing adequate support (e.g., positive encouragement or reshaping of tough experiences to constructive; Taylor & Collins, 2020).

By contrast, the AoE subscale did not yield any significant differences between stakeholders. This finding may point to an overt awareness of the related processes by stakeholders (e.g., goal setting, goal awareness, sporting development focus). Compared to the HQP, this alignment is an interesting juxtaposition, suggesting that perhaps European TDEs are better attuned to processes that are directly linked to athletic sporting development, which is also reflected in item-level data. Whilst this subscale agreement is a positive finding showing stakeholder coordination, to the contrary, it also shows that TDEs may not as overtly value in-direct sport-related processes (e.g., psychological skills, wellbeing, outside sport life balance). Stakeholder coordination for these factors could be improved through the inclusion of key principles (e.g., holistic development) in TDE philosophies, which are openly shared and promoted by all stakeholders and are symbolically visible in social spaces (Martindale et al., 2005).

Implications for Practice

The findings from this study offer several implications useful for leaders and coaches working to positively influence TDEs and those in coach education, to direct resource where it may be needed most. The depth and breadth of the sample across 5 countries and 27 sports, representing the largest and most diverse sample of TDEs to date has enabled a broad contextual assessment of the European TDE landscape, previously unavailable. This complements and expands existing TDEQ-based research which has typically focused on case studies of self-contained samples. This assessment showed LTD as highly rated, perhaps an opportune area of the environment for TDEs leaders to get right. TDEs should also provide adequate multidisciplinary support to athletes, especially where resources are available (Li et al., 2014). Coaches should promote this support, and where necessary consider educating athletes to utilise it (Taylor & Collins, 2021), showing the importance of life skill development to help athletes make the most of their TDEs (Lara-Bercial & McKenna, 2022a, 2022b).

Assessing TDEs from three different perspectives has revealed some interesting and informative differences. As such, a multi-stakeholder view of TDEs, whether this be for research or practice can only be encouraged as a means improve quantity and quality of information. Practically, results have shown that TDE leaders and coaches should consult each other, and parent and athletes with empathy through, for example, conversations, consultations or measurement tools (e.g., questionnaires). Stakeholders should be seen as “information assets” and “co-creators” of the TDE (Henriksen et al., 2010). Coaches have a responsibility to be open and aware to environment feedback, the coach-athlete relationship should be seen as a key factor in this, and coach reflective practices may be a useful tool (Jowett, 2017; Whitehead et al., 2016).

Finally, coordination between stakeholders is nuanced and should be viewed so. Efforts to support parents to understand intangible and particularly psycho-social processes should be made. In general, it is perhaps practically unrealistic to aim for absolute agreement in perceptions. Rather, there may be value in striving for mutual reinforcement of TDE goals (McNeill et al., 2018). TDE leaders could consider a goal-driven philosophy as a point of continual reference to guide stakeholder decisions and behaviours rooting them towards mutual reinforcement. For example, outlining the core ethos, vision and values of the TDE structured around shared mental model (Taylor & Collins, 2020). This shared mental model could emphasise promoting psycho-social awareness for parents. Stakeholders could discuss where they may seek the opportunity for slippage (e.g., autonomy), and how this can be navigated whilst remaining coherent to TDE goals (McNeill et al., 2018).

Recommendations for Future Research

Although the scope of the sample and novel adaptation of the TDEQ-5 has advanced knowledge, there are some noteworthy limitations to the study design, these provide direction for future research. Some caution is due with the TDEQ-5C scale, with a marginally low CFI score and high RMSEA 90% interval

level. Going forward, there is a need to further examine the psychometric characteristics of the TDEQ-5P and TDEQ-5C in a single language if these are to be further used. This study provides a springboard for future work in this space.

The study is also somewhat limited by having a varied distribution of the sample over the 5 countries. Similarly, the extrapolation of contextually specific findings is restricted due to the collection of limited sample demographic or sporting characteristics. The sample may also be limited by the gender split across stakeholders and the varied roles included under the umbrella of “coach”. It would be of value for future research to continue to examine TDEs, specifically multiple stakeholders, with a comparative sample design and detailed samples. For example, country or sport comparisons. This would continue to advance theory in this area.

Finally, as noted throughout this paper, perceptions and practice may vary. Observational and qualitative research would be of value to examine the stakeholder discrepancy phenomenon in TDEs, building on this study. For example, research could compare TDEQ-5C perceptions against observations and interviews. This would be powerful in understanding any discrepancies in detail, why they might exist and how – if needed – they can be reduced, likely improving coach practice and therefore athlete outcomes.

Conclusion

By adopting a novel methodological approach using new measurement tools and a large sample across stakeholders, TDE understanding has progressed. This research is the largest assessment of TDEs to date and is the first to examine and compare stakeholders’ perspectives simultaneously. In summary, perceptions of European TDEs are generally positive. LTD was the highest rated area across stakeholders, while SN was the lowest. Overall, coaches had higher perceptions than athletes and athletes had marginally higher perceptions than parents. HQP was the subscale with the largest differences in perceptions between stakeholders, there was no differences for AoE. Findings from the study suggest larger stakeholder agreement in sport and training processes and less agreement in intangible processes, particularly for parents. Above all, this study demonstrates the value of listening to stakeholder viewpoints in TDEs, an important message for those in practice.

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Data availability statement

The data that support the findings of this study are available from the corresponding author [BSM], upon reasonable request.

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