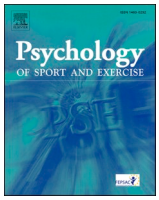
Psychology of Sport & Exercise 69 (2023) 102487

Contents lists available at ScienceDirect

Psychology of Sport & Exercise

journal homepage: www.elsevier.com/locate/psychsport



A mixed methods exploration of the parent perspective of talent development environments across a national multi-sport landscape

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ARTICLE INFO

Keywords:
Talent development environment questionnaire
Parents
Talent pathway

ABSTRACT

Parents are known to be important influencers in the talent development process but are often overlooked. Understanding the parent perspective may help National Governing Bodies and coaches improve their support for young talented athletes. This study aims to understand the parent perspective of the talent development experience across a national multi-sport landscape using mixed methods. Four hundred and eighty-five parents of pathway athletes completed the talent development environment questionnaire for parents (TDEQ-P), which included the opportunity for parents to respond in an open fashion. The results revealed several key relative strengths and weaknesses of the talent development environment. Areas identified for improvement included 1) Communication related to pathway understanding, planning, guidance, and feedback, 2) Individualised training, goal setting, and feedback, 3) Facilities, 4) Access to a specialist support network, in particular psychology support, 5) Engagement between coaches and, 6) Dual career management and engagement with educational institutions. The results also revealed evidence of context specific needs between performance level, sport type, and age group. The TDEQ-P may be an efficient and effective way coaches can access important feedback, improve communication, and build relationships with parents in sport.

1. Introduction

Talent identification (TI) and talent development (TD) within elite sport is big business. In 2020, top-flight football clubs across Europe spent an estimated €870 million on youth development (Kunti, 2022). While most sports cannot compete financially with this, finding ways to improve and invest in TI and TD processes is an area of high importance for all sporting programmes. In addition to financial investment, it is crucial to recognise the wide range of significant influences on developing athletes. For instance, Martindale et al. (2005; 2007) highlighted one of the key features of effective TD practice is to facilitate wide ranging, coherent messages, and support across the system. This is reinforced in Henriksen and colleagues' work (e.g., Henriksen et al, 2010), which identifies micro and macro influences on development from both within and outwith the sporting context (e.g., coaches, peers, parents, school, media, national and sporting culture more generally). Within this plethora of influence the coach is of course highly significant, and talent pathway athletes getting the right type of coaching at the right time is crucial for their development trajectory toward high performance (Abraham et al., 2006). Furthermore, although parents are often 'kept at arm's length' from elite youth development environments and sometimes even 'blamed' for not engaging appropriately (Harwood et al., 2019; Knight et al., 2017), their influence has also been shown to be crucial for successful athlete outcomes (Pankhurst et al., 2013).

Hellestedt (1987) outline in their parental involvement continuum model that parents can be detrimental to athlete development if they are either under or over involved, highlighting that a balance needs to be struck to provide the right kind of parenting (Brackenridge, et al., 2004). Unsurprisingly, supportive parenting that demonstrated warmth and positive emotions is often associated with good outcomes, while parenting with negative emotion and conflict is often associated with perceived athlete pressure and poor outcomes (Dorsch et al., 2016). Research has also identified a broader range of behaviours that are associated with positive outcomes. For example, Harwood and Knight's (2015) work on parenting expertise highlights behaviours including parents as 'providers' (e.g., tangible, informational, emotional support),

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https://doi.org/10.1016/j.psychsport.2023.102487
Received 20 March 2023; Received in revised form 4 July 2023; Accepted 7 July 2023
Available online 21 July 2023

'interpreters' (e.g., valuing effort, sportsmanship), and 'role models', as well as offering positive motivational climates and building a good network of support around the athlete. Of course, several researchers have also highlighted parent behaviours that have been shown to be detrimental to development (e.g., Mills et al., 2012). Typical negative behaviours have included excessive pressure; pushiness, controlling and critical behaviour; living vicariously through the child; mollycoddling or over-inflating a child's ego; providing inappropriate 'coaching' advice; or simply being embarrassing (Sánchez-Miguel et al., 2013; Witt & Dangi, 2018).

The evidence to date shows clearly that parents' behaviour matters, and several case studies of successful talent development environments (TDEs) have shown that parents are often, although not always, incorporated intentionally within the sporting environment to provide support in various guises (e.g., Henriksen & Stambulova, 2017). Depending on the sport, context, and parent characteristics, parents may be useful in different ways. For example, it would be expected that athletes are emotionally supported at home (e.g., Henriksen et al., 2010). In addition to this, many but not all sports also encourage some form of tangible input (e.g., coaching, administration, or housing athletes) that suits the parents' skill set or ability to contribute (e.g., Henriksen et al., 2011).

While it is important to recognise that parents' input may context specific, it seems logical to assume that regardless of the requirements of any parent contribution it is useful to ensure communication between coaches and parents is effective to make this clear. Supporting parents and facilitating understanding of their role within sport is critical, as highlighted by several parent education initiatives (e.g., Dorsch et al, 2017; Lafferty & Triggs, 2014; Vincent & Christensen, 2015). Synthesising these findings, it is of particular importance to help parents to access the knowledge and skills to be reflective in a practical, evidence based, and critical way. Effective TD systems rely on much more than simply the education of parents. For example, in Pankhurst et al.'s (2013) work on coherence within sport pathways, there was a lack of coherence not only about what different stakeholders believed was good practice (e.g., coach, parent, National Governing Body - NGB) but also about what different stakeholders thought other stakeholders believed. Therefore, ongoing communication to help significant others understand each other better and develop a coherent way forward is important, in addition to parent education.

Looking beyond education and coherence, parents likely possess greater depth of knowledge about their own children. As part of a wider system of multi-stakeholder feedback, they may well be a useful source of information about their child's experience to help coaches and NGBs reflect and improve the TD environment. Now more than ever, parents are involved in their children's sport (Stefansen et al., 2018), and as such, either through direct experience and/or through interactions with their child can provide a potentially useful external perspective of what experiences they believe their children are receiving. Engaging with parents as part of a formative evaluation process provides a natural avenue to not only understand parents better and give them a voice, but also as a catalyst to communicate, connect, and develop relationships which can be important for successful TD outcomes. Indeed, we must recognise the complexity of such sporting endeavour during adolescence and early adulthood, and the role parents play in helping their children negotiate this. Bio-psycho-social development is an enduring and difficult growth process. Combining life-phase with the demands of elite sporting development means young people are going to need parents (or someone) to help them make sense of it all.

It could be argued that parents are not likely to have the knowledge or be embedded in the sport enough to provide relevant feedback. However, work by Pankhurst et al. (2013) highlighted that neither parents, coaches, or NGBs strongly supported research-based recommendations about effective TD practice, and instead preferred the status quo. It is also important to recognise the role of culture on different stakeholders – in other words, parents, or indeed coaches and athletes may be shaped or pressured implicitly or explicitly to conform to expectations (Dorsch et al., 2015; McMahon & Penney, 2015). As such, asking different stakeholders to provide feedback using 'the right questions' may be crucial.

If feedback can be gleaned in a way 'which asks the right questions' then parents will be able to provide an opinion about the extent to which they perceive their child receives certain experiences, regardless of whether they believe those experiences to be good, bad, or neutral. This approach has already been established using athlete feedback. For example, Mills et al. (2014) showed how athletes can provide feedback on their experiences by completing the Talent Development Environment Questionnaire (TDEQ - Martindale et al., 2010); a tool which gleans information about the extent to which athletes believe they experience key features of effective TDEs. These features include Long Term Development Focus (i.e., programmes specifically designed to facilitate athletes' long-term, rather than short term success); Holistic Quality Preparation (i.e., preparation and consideration of athletes' lives inside and outside of sport); Support Network (i.e., a coherent, approachable, and wide-ranging support network); Communication (i.e., formal and informal coach communication about long term development requirements); and Alignment of Expectations (i.e., individualised goals for sport development are coherently set and aligned with athlete, parents and coaches) (Li et al., 2015). Not only does this enable athletes to reflect on certain features of effective environments, but it also helps coaches do the same, as well as better understand their athletes' perceptions. This provides a valuable player perspective, which can help inform a formative evaluation process (Cupples et al., 2021; Gangsø et al., 2021; Gesbert et al., 2021; Gledhill & Harwood, 2019; Mills et al., 2014; Thomas et al., 2020) and act as a mechanism to help drive forward reflection and evidence-based interventions (Hall et al., 2019).

By incorporating different stakeholders in this type of research-based formative evaluation process (e.g., Sargent Megicks et al., 2023), it helps facilitate communication and open, honest dialogue, as well as drive a multi-stakeholder feedback process for coaches to reflect and move practice forward in a research-informed way (Hall et al., 2019; Taylor et al., 2022). It could also help generate a shared understanding for coaches, athletes, and parents of the emergent, iterative process of athlete development. Those involved may understand the current status of athlete development in relation to future needs more clearly. This can be used to facilitate better informed, cooperative decisions and strategies creating a more coherent experience for all involved, especially the athlete. Finally, consideration of tools such as the TDEQ could facilitate a better understanding of effective TD for all involved.

Tools such as the TDEQ enable engagement, education, and feedback to be gleaned from large numbers of people, across whole pathway structures efficiently and effectively, enabling NGBs and coaches to take evidence-based actions and developments in a responsive and timely manner. Accordingly, this study aims to understand the parent perspective of the relative strengths and areas for improvement within a TD context across the talent pathway of a national multi-sport system. This will use a novel and validated Talent Development Environment Questionnaire for Parents (TDEQ-P), which incorporates a mixed method data collection protocol.

2. Methods

2.1. Research philosophy & design

This study adopted a mixed methods approach underpinned by a pragmatic research philosophy (e.g., Giacobbi et al., 2005). Pragmatism focusses on identifying research questions and methods that create meaningful and useful answers to practical problems. This is particularly relevant for applied research disciplines where 'making a difference' to the individuals or groups that it examines is a key goal (e.g., Corbin & Strauss, 2008). This contrasts with, for example, positivists who may seek generalisable 'truths', or constructionists who may seek

representations of socially constructed reality (e.g., Cruickshank & Collins, 2015). Using this approach, methods are chosen with the aim of providing solutions to context-specific problems without being driven by a definitive epistemological approach. In this study, this led to a combination of quantitative and qualitative methods being chosen for both data collection and analysis.

The quantitative data gleaned from the TDEQ provided knowledge development framed by empirically and theoretically derived generic features of effective TD practice. In contrast, the qualitative data from the open-ended survey questions allowed participants to provide unconstrained perspectives of context specific experiences, with as much depth as they chose. The data generated by these different methods was complementary and could be usefully combined to support conclusions.

The TDEQ data processing involved both factor and item-by-item analysis. This enabled an examination of broad contextual differences and similarities between environments (e.g., performance levels, age groups), as well as detailed information which provided more meaningful understanding related to specific areas of relative strength and weakness. The qualitative data processing involved both thematic analysis to identify common themes and tallying of theme occurrence to provide a sense of the extent that themes emerged across the population. Again, this provided complementary analysis to support the generation of meaningful conclusions.

2.2. Participants & procedure

Ethical approval was gained from the first author's institution. As part of a research project funded by the **sport**scotland Institute of Sport (Project ID 1816169), performance directors across a wide range of different sports were approached by a gatekeeper from the institute, invited to take part in the research, and sent information about the project. All sport governing bodies interested in supporting the project sent a link to an online survey platform (Qualtrics, Provo, UT) to the parents of their registered talent pathway athletes.

Four hundred and eighty-five parents (315 mothers; 168 fathers; 1 stepfather; 1 guardian) volunteered to take part by clicking on the link, consenting, and completing the anonymous survey. Sixty eight percent of the participants had at least one official helping role within their child's sport organisation (e.g., volunteer, coach). A range of team and individual sports were represented, 19.3% of athletes were team sport participants (Cricket 5.7%; Hockey 6%; Netball 7.6), and 80.7% were individual sport participants (Athletics 3.6%; Gymnastics 8.9%; Cycling 5.1%; Canoeing and Kayak 2%; Shooting 1%; Skiing 1.4%; Badminton 4.9%; Boccia 0.6%; Diving 0.6%; Golf 3.3%; Judo 9.7%; Rowing 3.3%; Sailing and windsurfing 1.2%; Swimming 29.4%; Squash 3.7%; Tennis 0.8%; Triathlon 1.2%).

The 'talent pathway athlete' children of the participants included 251 females and 233 males, with an average age of 14.7 (±2.4). Ninety-seven were currently performing at international level, 284 at national level, 76 at regional level, and 21 at club level. Please note, there were some missing answers relating to gender and performance level.

2.3. Measures

2.3.1. Demographics

Parents were asked a range of demographics details including: their relationship to their child; the role they perceived they played within their child's sport organisation; the age and gender of their child; the current level of performance of their child; and the sport their child played.

2.3.2. Talent development environment questionnaire for parents (TDEQ-P)

The original TDEQ-5 was adapted for use in the present study (Li et al., 2015). The wording of each item was adapted to make sense from a parent's perspective. For example, item 3 in the TDEQ-5 "The advice my parents give me fits well with the advice I get from my coaches" was changed to "The advice I give as a parent fits well with the advice my child gets from their coaches". Another example, item 14 from the TDEQ-5 "I regularly set goals with my coach that are specific to my individual development" was changed to "My child regularly set goals with their coach that are specific to their individual development".

In line with the original TDEQ-5, the TDEQ for parents included 28 items measuring five subscales: support network (six items; e.g., "My child can pop in to see their coach or other support staff whenever they need to"); long-term development focus (six items; e.g., "My child's training is specifically designed to help them develop effectively in the long term"); holistic quality preparations (seven items; e.g., "My child's coach rarely talks to my child about their well-being"; communication (four items; "My child's coach and my child often try to identify what the next big test will be before it happens"); and alignment of expectations (five items; e.g., "My child regularly set goals with their coach that are specific to their individual development". Items were scored on a 7-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree". The TDEQ for parents enabled parents to report their perceptions of their child's experience within the context of 'research-based guidelines for effective practice'.

2.3.3. Open ended questions: strengths and areas for improvement

The research team deemed it important and useful to allow parents the opportunity to provide more open ended, context specific feedback in addition to the more generic questions outlined in the TDEQ for parents. In line with this, two open ended questions were asked, specifically: 1) Please describe three strengths of the environment your child trains and competes in, and 2) Please describe three areas for improvement for the environment your child trains and competes in.

2.4. Data analysis

2.4.1. Confirmatory factor analysis

A confirmatory factor analysis was conducted to examine the factorial validity of the TDEQ for parents (Muthén & Muthén, 2017). A robust maximum likelihood estimation approach was used. Several fit indices were used to assess model fit, including comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Goodness of fit is considered adequate if the CFI score is 0.90 or above, with an SRMR value under 0.08 and an RMSEA value under 0.60 (Hair et al., 2010; Hu & Bentler, 1999). Internal consistency was examined for the best-fit model using Cronbach α coefficients for the factors of the scale, where anything above 0.60 is considered adequate and above 0.70 good (Hair et al., 2010). Discriminant validity was also examined and was considered robust if the confidence interval of estimated correlations between the latent factors does not exceed 1.00 (Anderson & Gerbing, 1988). Factor loading estimates provide an indication of the item level of convergent validity was also tested, where factor loadings higher than 0.40 were deemed acceptable.

2.4.2. TDEQ for parents - factor and item-by-item analysis

After negative items were reversed, descriptive statistics were calculated for the five factors and all individual item scores within the TDEQ-P. A repeated measures MANOVA was used to determine whether any statistical differences were apparent between the features of the environment (i.e., support network; long-term development focus; holistic quality preparation; communication; and alignment of expectations). MANOVAs were used to examine potential differences in athlete experience depending on the context within the sporting landscape (i.e., performance level, sport type, age group, and athlete gender), and who was completing the TDEQ-P (i.e., parent gender).

In Martindale et al.'s (2010) original TDEQ development paper it was recommended for applied research to present item-by-item scores to provide the most specific and informative feedback to coaches. This

technique has subsequently been used successfully in a variety of applied research projects across a range of different sport contexts (e.g., Cupples et al., 2021; Gangso et al., 2021; Gesbert et al., 2021; Gledhill & Harwood, 2019; Hall et al., 2019; Mills et al., 2014; Mitchell et al., 2021; Sargent Megicks et al., 2023; Thomas et al., 2020).

Given the large scope of this study (i.e., multiple sports, performance levels, and age groups), it was decided that this more detailed level of analysis would be conducted on the overall sporting landscape (i.e., all 485 participants), rather than across multiple context specific domains. It is important to note that more informative, bespoke guidance and understanding would be generated by providing context specific feedback (e.g., U18 international hockey) to relevant coaches and NGBs. However, this level of analysis is beyond the scope of this paper.

Following this, all items were subsequently ranked by mean score, where higher scores were considered better experiences. The top 25% of items were considered 'relative strengths' and the bottom 25% of items were considered 'relative weaknesses'. This process led to a detailed, quantitative analysis of the key strengths and areas for improvement as seen through the eyes of the parents.

2.4.3. TDEQ for parents - qualitative analysis

The qualitative responses generated by the two open ended questions were analysed inductively using an adapted reflexive thematic analysis (Braun & Clarke, 2019). This followed the six-stage process offered by Braun and Clarke: 1) Familiarisation, 2) Generating initial codes, 3) searching for themes, 4) Reviewing themes, 5) Defining and naming themes, and 6) Producing the report. The adaptation of this process involved a quantitative tallying of the number of responses for each code to give a sense of how common particular feedback codes and themes were across the 485 participants' responses. Like the item-by-item analysis, given the scope of this study, this more detailed qualitative analysis focussed on the overall sporting landscape, rather than multiple context specific domains (e.g., U14 club cricket).

3. Results

3.1. Confirmatory factor analysis

There were no missing values in the data set, as such, data imputation was not required. As expected, given the sensitivity to sample size, the chi-square test was statistically significant. However, the ratio of the chi-square statistic and the degrees of freedom was 3.06, where under five is commonly considered to represent an adequate fit (Watkins, 1989). Other indices of model fit such as CFI, RMSEA, and SRMR demonstrated evidence of good fit. Specifically, as Table 1 shows, CFI exceeded the cut off of 0.9 with a score of 0.993, RMSEA was under 0.08 with a score of 0.065, and the SRMR score was under the cut off value of 0.60 with a score of 0.05.

These data supported a 5 factor, 28 item solution for the TDEQ for parents. Specifically, Factor 1 – Long Term Development Focus (items 19, 20, 22, 23, 25, 28); Factor 2 – Holistic Quality Preparation (items 2, 5, 10, 11, 12, 13, 17); Factor 3 – Support Network (items 1, 7, 9, 18, 26, 27); Factor 4 – Communication (items 4, 6, 8, 21) and; Factor 5 – Alignment of Expectations (items 3, 14, 15, 16, 24) – see supplementary material for full TDEQ-P.

The internal reliability of the TDEQ for parents was deemed adequate given all values were above 0.60. Specifically, the Cronbach α scores for the individual factors 1–5 were 0.812; 0.840; 0.830; 0.873; 0.805, respectively. Discriminant validity of the scale was also supported as the latent factor correlations ranged from 0.793 to 0.952, with none of the 95% confidence interval correlation coefficients exceeding 1.00. Factor loading estimates provided an indication of a satisfactory level of convergent validity, ranging from 0.478 to 0.917.

Table 1
Goodness-of-fit statistics for TDEQ for parents.

Models	*df*	*χ2*	P	RMSEA	CFI	SRMR
5 factor, 28 item TDEQ for parents (TDEQ-P)	340	1039.342	<.001	.065	.993	.05

3.2. TDEQ for parents – factor and item-by-item analysis

The means and standard deviations of the five factors of the TDEQ for parents are presented in Table 2. On average, parents highlighted that their children received positive experiences within their respective TDEs, reporting moderate (4.35) to high (5.45) scores for the five TDE factors. Long Term Development Focus, Alignment of Expectations, and Communication all averaged above 5 ('agree somewhat' to 'agree'), and Holistic Quality Preparation and Support Network averaged above 4 ('neither agree nor disagree' to 'somewhat agree'). A repeated measures ANOVA revealed statistically significant differences between the TDEQ factors ($F(4, 1936) = 309.355$, $p < .01$, $\eta_p^2 = 0.390$). Specifically, the mean score for Long Term Development Focus was significantly higher than the other four factors. There were no statistical differences between Alignment of Expectations and Communication, or Support Network and Holistic Quality Preparation. However, the mean scores for both Alignment of Expectations and Communication were statistically higher than Support Network and Holistic Quality Preparation.

A series of MANOVAs revealed no statistically significant differences for environment experience between athlete gender ($F(5, 478) = 0.805$, $p > .05$, $\eta_p^2 = 0.008$) or parent gender ($F(5, 479) = 2.037$, $p > .05$, $\eta_p^2 = 0.021$). In other words, parents of male or female athletes perceived their child to have similar experiences, and fathers and mothers did not differ in their perceptions. However, there was a statistically significant difference between environmental experience across performance levels ($F(5, 472) = 8.133$, $p < .01$, $\eta_p^2 = 0.079$). Higher scores were apparent for those training and competing at more advanced performance levels for Long Term Development Focus ($p < .05$, $\eta_p^2 = 0.02$), Support Network ($p < .01$, $\eta_p^2 = 0.066$), Communication ($p < .01$, $\eta_p^2 = 0.028$), Alignment of Expectations ($p < .01$, $\eta_p^2 = 0.028$), but not for Holistic Quality Preparation ($p > .05$, $\eta_p^2 = 0.01$) (See Figure 1).

Some similarities existed in the relative pattern of environmental features across levels. For all levels, Long Term Development Focus was the strongest feature, with Alignment of Expectations/Communication mid-range, followed by Support Network/Holistic Quality Preparation as the relatively weakest features. For international athletes, Holistic Quality Preparation was the lowest scoring factor, whereas Support Network was the lowest scoring factor for the other three performance levels.

There was a statistically significant difference between sport types ($F(5, 479) = 3.433$, $p < .01$, $\eta_p^2 = 0.035$) and age groups ($F(5, 479) = 4.808$, $p < .01$, $\eta_p^2 = 0.048$). Specifically, Alignment of Expectations showed a significantly higher mean score for individual sports verses team sports. Support Network showed a significantly higher mean score for the older age group (16 and over). However, there were no

Table 2
Means and standard deviations for TDEQ for parents' factors.

TDEQ-P Factor	Mean	Standard deviation	Range (min 1-7 max)	Statistical significance
Long term development focus (LTD)	5.45	.91	2.5–7	p < .01 – AoE, Com, HQP, SN.
Alignment of expectations (AoE)	5.24	1.11	2.2–7	p < .01 – LTD, HQP, SN.
Communication (Com)	5.19	1.27	1–7	p < .01 – LTD, HQP, SN.
Holistic quality preparation (HQP)	4.43	1.18	1–7	p < .01 – LTD, AoE, Com
Support network (SN)	4.35	1.27	1.5–7	p < .01 – LTD, AoE, Com

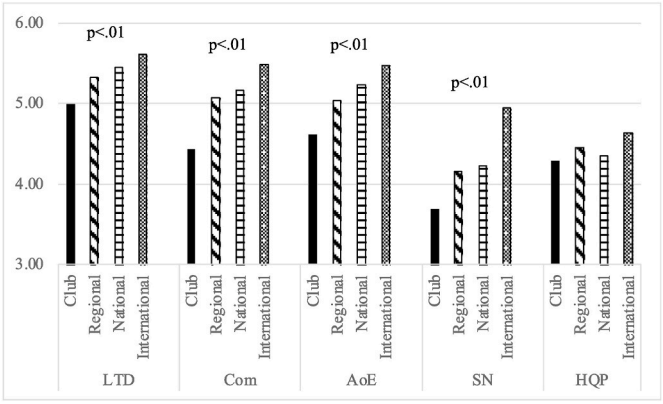

Figure 1. TDEQ factor scores by performance level.

significant differences for the other environment factors ($p > .05$) (see Figure 2).

The means and standard deviations of the 28-items of the TDEQ for parents are presented in Figure 3. The item-by-item analysis highlighted more specific 'relative strengths' and 'relative weaknesses' from the parents' perspective, with the highest 25% scoring items being considered 'strengths' (light grey), and the lowest 25% of items being considered 'weaknesses' or 'priority areas for improvement' (dark grey).

Long Term Development Focus – Four of the six items within this Factor were considered strengths, and none were considered as areas for improvement. Specifically, two items related to learning found that 71% of parents agreed or strongly agreed that coaches emphasised the need for constant work on fundamental and basic skills (M = 5.78), and 55.2% agreed or strongly agreed that the athletes were allowed to learn through making their own mistakes (M = 5.39). Two items related to development priority found that 61% of parents agreed or strongly agreed that the coach emphasises that what the athletes do in training and competition is far more important than winning (M = 5.55), and 59.8% of parents agreed or strongly agreed that training is specifically designed to help athletes develop effectively in the long term (M = 5.47).

Alignment of Expectations – Two of the five items within this Factor were highlighted as strengths, and none as weaknesses. These two items related to coherent messages between parents and coaches, and involvement of athletes in decision making. Specifically, 65.2% of parents agreed that "My child is involved in most decisions about their sport development" (M = 5.58), and 66.6% agreed that "The advice I give as a parent, fits well with the advice my child gets from their coaches" (M = 5.67).

Communication – one of the four items within Communication was considered a strength and none a weakness. Specifically, 64.7% of parents agreed that coach and the athlete regularly spoke about the things needed to progress to the top level in the sport (M = 5.59).

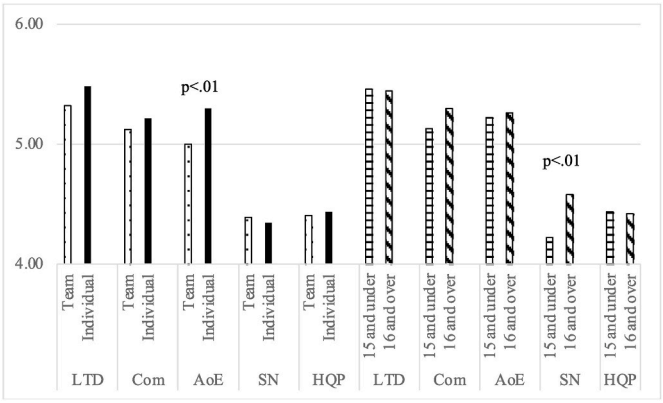

Figure 2. TDEQ factor scores by sport type and age group.

Holistic Quality Preparation – Four of seven items within this Factor were highlighted as weaknesses. Only 18.9% of parents agreed that "My child gets help to develop their mental toughness in sport effectively" (M = 3.73), while 28.7% agreed that "My child is encouraged to plan for how they would deal with things that might go wrong" (M = 4.25). In relation to understanding sport pathway requirements, only 33.4% of parents agreed that "My child is taught about how to balance training, competing and recovery" (M = 4.39) and 26.2% agreed that "The guidelines in my child's sport regarding what my child needs to do to progress are clear" (M = 4.16).

Support Network – Three of the six items in this Factor were considered areas for improvement. One key feature was related to support professionals, where 27% agreed that "Currently, my child has access to a variety of different types of professionals to help their sports development" (M = 3.77), while only 17.5% of agreed that "My child's coaches talk regularly to the other people who support my child in sport about what my child is trying to achieve" (M = 3.81). The other feature highlighted was related to educational support, where only 18.7% of parents agreed that "My child's coaches ensure that their school/university/college understand about them and their training/competitions" (M = 3.69).

3.3. TDEQ for parents - qualitative analysis

Across the 485 participants 2325 data points were coded, 1286 codes were strengths that were identified by the parents (see Figure 4), and 1039 were coded as areas for improvement (see Figure 5). Seven themes were generated that were identified as strengths. With the associated percentage of data codes that were collated under each theme, these included 1) Positive environment (33.1%), 2) Long term development focus (20.3%), 3) Positive peers and role models (15.9%), 4) Coaching (13.5%), 5) Good facilities and equipment (7.2%), 6) Local training (1.5%) and finally, 7) Funding and NGB support (0.2%). When evaluating the individual sub-themes, seven emerged that accounted for more than 5% of the data each. These included 1) Positive, encouraging motivational climate, 2) Friendly and welcoming environment, 3) Quality coaching, 4) Supportive environment, 5) Good equipment and facilities, 6) Nurturing learning environment, and 7) Friendship and peer support.

Similarly, seven main themes were generated as areas for improvement by the participants. These themes included 1) Individualised, quality, long term support opportunities (35.0%), 2) Communication, guidance, co-ordination, and advanced warning (20.3%), 3) Specialist support (psych, nutrition, fitness, physio) (16.2%), 4) Facilities and equipment (12.1%), 5) Travel, geography, and funding (9.1%), 6) Training groups and role models, (5.9%) and 7) Miscellaneous (1.4%). The individual sub theme analysis revealed four items that accounted for at least 5% of the data each. These included 1) Poor communication with parents (lack of pathway understanding, guidance, feedback and communication), 2) Lack of individualised training, goal setting, and feedback, 3) More or better facilities needed, 4) Lack of psychologist or advice on psychology/mental wellbeing.

4. Discussion

This study carried out a mixed methods exploration of the parent perspective of TDEs across a national multi-sport system. For this purpose, the Talent Development Environment Questionnaire for Parents (TDEQ-P) was developed, validated, and implemented. The TDEQ-P provides an evidence-based mechanism through which a large volume of parent perspectives could be gleaned and analysed efficiently and effectively across a whole national sporting landscape. This process not only accesses potentially valuable feedback to help coaches and NGBs reflect and improve the environment but could also act as a more

Items	Min	Max	Mean	Std. Dev
28 My child's coach emphasises the need for constant work on fundamental and basic skills	1	7	5.78	1.17
3 The advice I give as a parent fits well with the advice my child gets from their coaches	1	7	5.67	1.06
6 My child's coach and my child regularly talk about things my child needs to do to progress to the top level in their sport (e.g. training ethos, competition performances, physically, mentally, technically, tactically)	1	7	5.59	1.45
15 My child is involved in most decisions about their sport development	1	7	5.58	1.34
25 My child's coach emphasises that what they do in training and competition is far more important than winning	2	7	5.55	1.24
19 My child's training is specifically designed to help them develop effectively in the long term	1	7	5.47	1.35
22 My child's coach allows my child to learn through making their own mistakes	1	7	5.39	1.15
20 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	1	7	5.37	1.27
7 Those who help my child in sport seem to be on the same wavelength as each other when it comes to what is best for them (e.g. coaches, physiotherapists, sport psychologists, strength trainers, nutritionists, lifestyle advisors etc.)	1	7	5.35	1.37
14 My child regularly set goals with their coach that are specific to their individual development	1	7	5.27	1.56
23 My child would be given good opportunities even if they experienced a dip in performance	1	7	5.14	1.41
8 My child's coach and my child often try to identify what the next big test will be before it happens	1	7	5.13	1.50
21 My child's coach explains how their training and competition programme work together to help them develop	1	7	5.11	1.52
24 My child's progress and personal performance is reviewed regularly on an individual basis	1	7	5.02	1.57
4 My child's coach and my child talk about what current and/or past world class performers did to be successful	1	7	4.95	1.50
5 My child's coach doesn't appear to be that interested in my child's life outside of sport	1	7	4.93	1.63
26 My child's training programmes are developed specifically to their needs	1	7	4.91	1.62
13 My child's coach rarely talks to my child about their well-being	1	7	4.83	1.58
12 My child's coach rarely takes the time to talk to other coaches who also work with my child	1	7	4.68	1.65
16 My child's coaches make time to talk to us as parents about my child and what they are trying to achieve	1	7	4.65	1.78
1 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 etc.)	1	7	4.57	1.92
17 My child is not taught that much about how to balance training, competing and recovery	1	7	4.39	1.67
2 My child is rarely encouraged to plan for how they would deal with things that might go wrong	1	7	4.25	1.67
10 The guidelines in my child's sport regarding what my child needs to do to progress are not very clear	1	7	4.16	1.652
18 My child's coaches talk regularly to the other people who support my child in sport about what my child is trying to achieve (e.g. physiotherapist, sport psychologist, nutritionist, strength & conditioning coach, life style advisor etc.)	1	7	3.81	1.597
9 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 etc.)	1	7	3.77	2.037
11 My child doesn't get much help to develop their mental toughness in sport effectively	1	7	3.73	1.696
27 My child's coaches ensure that their school/university/college understand about them and their training/ competitions	1	7	3.69	1.752

Figure 3. Factor and item-by-item analysis (light grey - top 25%, dark grey - bottom 25%).

systematic mechanism to facilitate engagement with, communication with, and education of parents within the sport talent pathway process.

The first phase of work required the adaptation of the wording of TDEQ-5 (Li et al., 2015) to be appropriate from a parent's perspective, leading to the development of the TDEQ-P. The results of a confirmatory factor analysis showed support for a 28 item, 5 factor solution. The internal reliability of the TDEQ for parents was deemed good and discriminant validity of the scale was also supported, providing evidence that the TDEQ-P could be used with confidence.

It is interesting to point out that athlete versions of the TDEQ-5 have demonstrated good CFI scores (range 0.900–0.934), and poor to excellent internal reliability scores ranging between 0.42 and 0.89 (Brazo-Sayavera et al., 2017; Gesbert et al., 2021; Li et al., 2015; Li et al., 2017; Thomas et al., 2020; Thomas et al., 2021). The TDEQ-P demonstrated strong psychometric properties compared to the athlete versions. This may potentially be related to the fact that all TDEQ-5 research to date has been conducted with adolescents and young adults with sample mean ages ranging from 15.2 to 17.6 years, whereas this TDEQ-P research was conducted with the parents of these types of young people. As such, an understanding of what is being asked within the questionnaire items may be improved, which may subsequently improve the validity and reliability of answers given and strengthen the psychometric properties of the TDEQ-P, as compared to previous work with young people. It is important to acknowledge that research conducted by Sargent Megicks et al., (2023) has validated a 23 item TDEQ-P using a multi-language population. However, they identified a need to further examine the psychometric characteristics of this tool in a single language if it is to be used further. Our work has helped answer this call serendipitously, highlighting strong psychometrics for a 28 item TDEQ-P within an English-speaking context. Sargent Megicks and colleagues also highlighted a need for future research to compare the TDEQ-P with interviews or observations. We agree that this would be worthwhile if time and resources allow. However, in situations requiring a more pragmatic or large-scale approach, the TDEQ and survey method

Themes	Sub-Themes	N	%	Individual Sub-Themes Over 5%	%
Positive Environment	Positive, encouraging motivational climate	114	8.86	Positive, encouraging motivational climate	8.86
	Friendly & welcoming	98	7.62	Friendly & welcoming	7.62
	Supportive environment	97	7.54	Quality coaching	7.62
	Fun	62	4.82	Supportive environment	7.54
	Safe	26	2.02	Good equipment & facilities	7.15
	Inclusive	24	1.87	Nurturing learning environments	6.38
	Volunteers	5	0.39	Friendships & peer support	6.14
		Total %	33.13		
Long Term Development Focus	Nurturing learning environments	82	6.38		
	Professional, organised & structured	58	4.51		
	Psychological ethos (e.g. work ethic, discipline, morals etc)	54	4.20		
	Holistic long term focus (e.g. life skills, welfare, balance, long term success)	35	2.72		
	Competitive	29	2.26		
	Build psychological skills (e.g. confidence, resilience, responsibility etc)	24	1.87		
	Challenging	23	1.79		
	Individual athlete focussed	20	1.56		
	Good competition opportunities	15	1.17		
	Fitness & strength	14	1.09		
	Support services available (e.g. physio, doctor, psychologist etc)	8	0.62		
	Skill development	7	0.54		
		Total %	28.69		
Positive Peers & Role Models	Friendships & peer support	79	6.14		
	Team spirit & team work	60	4.67		
	Quality training peers	45	3.50		
	Active role models	21	1.63		
		Total %	15.94		
Coaching	Quality coaching	98	7.62		
	Supportive, collaborative coaches	39	3.03		
	Dedicated coaches	25	1.94		
	Fair & transparent coaches	11	0.86		
		Total %	13.45		
Good equipment & facilities	Good equipment & facilities	92	7.15		
		Total %	7.15		
Local training	Local training	19	1.48		
		Total %	1.48		
Funding & NGB support	Funding & NGB support	2	0.16		
		Total %	0.16		

Figure 4. Strengths identified in open ended questions.

outlined in this study may enable access to a more representative, wider range of qualitative perceptions across any sporting landscape.

The results of the TDEQ-P analysis revealed that parents perceived their children's TDE experience, on average was positive, with stronger features including Long Term Development Focus, followed by Alignment of Expectations, and Communication, and less strong features including Holistic Quality Preparation and Support Network. Several previous studies have investigated the strengths and weaknesses of talent environments across different contexts, using the TDEQ (e.g., Apollaro et al., 2021; Cupples et al., 2021; Curran et al., 2022; Elumaro, et al., 2021; Gangso et al., 2021; Gesbert et al., 2021; Gledhill & Harwood, 2019; Mahmood et al., 2018; Mills et al., 2014; Mitchell et al., 2021; Sargent Megicks et al., 2023; Thomas et al., 2020). Like much of the work in this area to date, Long-term Development Focus was found to be the strongest factor in this study. Exceptions to this trend include research in a range of professional football academies (Gangso et al., 2021; Mills et al., 2014; Mitchell et al., 2021), and older cohorts (U18/U23) within a national hockey pathway (Curran et al., 2022), where Support Network has been found to be the key strength. Like Curran's work, our data also showed Support Network to be rated as significantly better for older athletes.

Support Network is not always found to be a strength. In two larger cohort studies investigating a wider range of pathways (i.e., athletes across performance levels and ages) Support Network ranked the weakest factor (Sargent Megicks et al., 2023; Thomas et al., 2020). Similarly, this study revealed Support Network as the weakest factor for all levels, except for international athletes. It makes sense that providing a formal support service is more straightforward in well-resourced, focussed TDEs, but challenging at lower levels with larger numbers of participating athletes. However, consideration of how to disseminate support services and specialist knowledge is important, as research shows that athletes can benefit greatly from this type of support and knowledge, and often wish they had been able to access it earlier in their careers (e.g., Burns et al., 2022).

Holistic Quality Preparation was also ranked as relatively weak in this study, which has been shown to be a common trend in other work (Apollaro et al., 2021; Cupples et al., 2021; Curran et al., 2022; Elumaro, et al., 2021; Mahmood et al., 2018). This may be unsurprising because while the holistic preparation of athletes (including psychological development and mental health) is high on the agenda of many sport organisations, a lack of time, understanding, and accessible knowledge makes it difficult for coaches to implement with confidence (e.g., Pain & Harwood, 2004; Pope et al., 2015).

Furthermore, three studies of professional football academies/

Themes	Sub-Themes	N	%	Individual Sub-Themes Over 5%	%
Individualised, quality, long term support opportunities	Individualised training, goal setting & feedback	127	12.22	Individualised training, goal setting & feedback	12.22
	More, better and/or more consistent coaching	36	3.46	Poor communication with parents (lack of pathway understanding; guidance, feedback and communication)	10.68
	More, better training opportunities	36	3.46	More or better facilities	9.62
	Pressured short term performance v long term development	26	2.50	Psychologist or advice on psychology/mental wellbeing	5.87
	More and/or better competition opportunities	25	2.41		
	Lack of support, encourgament and athlete understanding	24	2.31		
	Training times inaccessible/challenging	20	1.92		
	Coaches 'signing from same hymn sheet' across levels	19	1.83		
	Technical advice / skill development	15	1.44		
	Fairness, equality in athlete treatment, recognising success all levels	14	1.35		
	Training intensity / Lack of challenge	12	1.15		
	Support at competitions	10	0.96		
		Total %	35.03		
Communication, guidance, coordination & advanced warning	Poor communication with parents (lack of pathway understanding; guidance, feedback and communication)	59	10.68		
	Forward planning & advanced communication	23	2.21		
	Organisation & structure	20	1.92		
	Coordination between school and sport	20	1.92		
	Monitoring & balancing multiple commitments	14	1.35		
	NGB communication & access	10	0.96		
	Selection (timeliness, transparency, fairness and feedback)	9	0.87		
	Leadership	4	0.38		
		Total %	20.31		
Specialist support (psych, nutrition, fitness, physio)	Psychologist or advice on psychology/mental wellbeing	61	5.87		
	Support specialists (e.g. physio, nutrition, psych, s&c etc)	37	3.56		
	Nutritionist or advice with diet	26	2.50		
	Fitness & strength/conditioning	25	2.41		
	Physiotherapy or rehab support	19	1.83		
		Total %	16.17		
Facilities & equipment	More or better facilities	100	9.62		
	Better or more equipment	26	2.50		
		Total %	12.13		
Travel, geography & funding	Travel time & associated geographical disadvantages	50	4.81		
	Costs and/or funding	44	4.23		
		Total %	9.05		
Training group & role models	Team togetherness & bonding	27	2.60		
	More and/or better training partners	17	1.64		
	Unacceptable athlete behaviour	9	0.87		
	Access to role models to train with	8	0.77		
		Total %	5.87		
miscellaneous	Politics	3	0.29		
	minority groups support (e.g., gender, diability)	6	0.58		
	Parents behaviour	6	0.58		
		Total %	1.44		

Figure 5. Areas for improvement identified in open ended questions.

pathways revealed Alignment of Expectations as the weakest factor (e.g., Gesbert et al., 2021; Gledhill & Harwood, 2019; Mills et al., 2014), perhaps highlighting an extra challenge for such environments to engage with parents and provide individualised development opportunities (e.g., Martindale & Mortimer, 2011). Indeed, our data showed that team sports scored significantly lower than individual sports for Alignment of Expectation, suggesting this challenge may be particularly acute across team sports, not just specific to professional football.

Except for Holistic Quality Preparation, this study found that the quality of the environment was better as the performance levels of the athletes increased. Other work has also found higher level athletes experience better quality environments (Apollaro et al., 2021; Curran et al., 2022). On the surface, this is perhaps understandable, resources are often limited, and age group international athletes may be deemed to have more potential to progress. However, research highlights that there isn't a strong correlation between success at age group and senior level (Vaeyens et al., 2009). As such, the consideration of the quality of development environments for a wider range of 'fringe' age group

athletes is vital.

The item-by-item analysis revealed the top 25% relative strengths and bottom 25% relative weaknesses, or areas for improvement. Strengths included items related to forward thinking, planning, and prioritising for long term success (e.g., items 6, 25, and 19), facilitating autonomy and getting the basics in place (e.g., items 28, 15, and 22), and the coherency between coach and parent messaging to athletes (e.g., item 3). This bodes well for this sport system because significant barriers to progression and effective development in youth sport include cultures that emphasise short term success, and inconsistent messages to athletes (e.g., Pankhurst et al, 2013; Witt & Dangi, 2018). Furthermore, fostering athlete autonomy aids the development of intrinsic motivation and self-regulation which have been shown to be crucial for future success (e.g., Burns et al., 2022). While it is encouraging for these features to be considered, on average strengths overall, they should not be taken for granted. On-going communication and monitoring always helps to ensure strengths stay strong, and for good practice to be shared where appropriate.

As with previous research, item-by-item analysis revealed a more nuanced understanding (e.g., Gledhill & Harwood, 2019; Mitchell et al, 2022; Thomas et al, 2022). On a factor level, Long Term Development Focus was the key strength in this study, but item-by-item analysis revealed the strengths included four items from Long Term Development Focus, two from Alignment of Expectations and one from the Communication. Similarly, while Support Network was rated as the lowest scoring factor, item-by-item analysis revealed four items from Holistic Quality Preparation, as well as three from Support Network were in the bottom 25% of items.

The open-ended questions data supports some of these features, with nearly 30% of data points relating to strengths being categorised under the theme 'long term development focus'. Individual subthemes representing more than 5% of data codes each included a number of features related to the positive nature of the environment and quality of coaching and facilities, for example 1) Positive, encouraging motivational climate, 2) Friendly and welcoming environment, 3) Quality coaching, 4) Supportive environment, 5) Good equipment and facilities, 6) Nurturing learning environment, and 7) Friendship and peer support. A number of these features focus on the positive atmosphere of the environment, which may well link to effective coaching behaviours outlined in task oriented and autonomy supportive motivational climates (e.g., Keegan et al., 2014). However, the data does have enough depth to enable a conclusion about what specifically led parents to these observations. This would be an area of interest for future research. Indeed, when using this methodology, additional instructions might usefully remind participants to provide as specific feedback as possible.

It is crucial to recognise and vocalise what coaches and NGBs do well, and in tandem, these two data sources provide a useful overview of parents' perceptions of the strengths of the TDEs across a range of different sports. Of course, on a more practical, specific level, analysis by sport, performance level and age grouping would allow more context specific feedback to be provided. However, due to the scale of this work, it was deemed beyond the scope of the study to report specific item-by-item and qualitative analysis to that level. Although, this type of analysis would be recommended when using this technique for applied purposes.

In relation to areas for improvement, the item-by-item analysis revealed concerns about a lack of access to professional support services (e.g., items 9 and 18). Indeed, these types of concerns have been raised by parents in previous literature (e.g., Harwood & Knight, 2009). Yet, considering that professional support is often hailed as a strength in professional and elite academy structures (e.g., Gangso et al., 2021; Hall et al., 2019), this is often not the case in research investigating a wider range of pathway environments, as observed in this study.

Areas for improvement identified by parents also included communication with educational institutes to ensure help with managing a dual career (e.g., item 27), and help with the development of a strong mindset (e.g., item 11). Concerns around education and support for dual career is not new, neither is a lack of support for psychological development (e.g., Harwood et al., 2010). However, both are considered crucial elements of effective environments (MacNamara & Collins, 2010; Pink et al., 2015). These data highlights that efforts and resource to help improve relationships and communication between sport and education would add value to talent pathway athletes. Similarly, resourcing sport psychology provision and educating coaches on how to implement psychological development within day-to-day practice could be considered a priority.

Finally, three items related to parents struggling to understand the development process were included (e.g., item 2, 10, and 17). Communication around development processes such as these has been highlighted by previous research as the number one stressor for parents of pathway athletes (e.g., Harwood et al., 2010; Horne et al., 2022). As such, increased efforts to provide clarity to the development process, signpost opportunities and discuss and manage development plans on an individual basis seems to be important for continued improvement of the talent pathway process.

The open-ended questions included in this study related to areas for improvement supported and added additional insight to the features identified through the TDEQ-P item-by-item analysis. For example, just over 16% of data codes related to the need for more specialist support (e.g., psychology, nutrition, fitness, physiotherapy), with particular emphasis on psychological support. This finding was also prominent within the item-by-item analysis, both regarding access to support and getting effective help with mental toughness development. This is an area that has been highlighted in the literature as a key concern for athletes (e.g., Burns et al., 2022). Open ended responses also highlighted a lack of communication and collaboration with parents (20.3%) in relation to things such as pathway understanding, general guidance, managing commitments, feedback relating to their child, advanced warnings, and transparency about training/competition/selection. Again this issue is not new, and has been highlighted in previous research (e.g., Mills et al., 2012). Given the potential influence of parents in the sport pathway (e.g., tangible, informational, esteem and emotional support providers - Harwood & Knight, 2015), it would appear to be a good use of time to build relationships, communicate with and support parents to understand and engage effectively in the process (Harwood et al., 2019). More and/or better facilities also emerged as a significant piece of feedback with almost 10% of data codes, an area previously identified as a potential hindrance to successful development (e.g., Duffy et al., 2006).

Finally, one feature that emerged strongly from this data source was the need for more individualised training, goal setting and feedback, and more consistent and better-quality training and competition opportunities (35%). This may be perceived as concerning given the essential nature of these elements for maximising successful outcomes (e.g., Douglas & Martindale, 2008; Ivarsson et al., 2015). Paradoxically, 'quality coaching' was highlighted as a strength in the qualitative data (over 5% of themes). This highlights the importance of acknowledging the potential inconsistency, and context specific nature of TDEs across the pathway. This point was evidenced by the differences between performance levels, sports, and ages, and supports the potential value of context specific feedback for the applied application of this tool. It is also worth noting that the feedback gleaned through this type of process is providing information for coaches to reflect upon. It is not stating what must be prioritised. For example, in the TDEQ work by Hall et al. (2019) in an elite rugby context, one item that was rated as relatively weak was not included in intervention planning as it was not considered to be a priority for that cohort of athletes. Along the same lines, moderately rated items may be deemed worthy of being optimised as a priority.

The combination of feedback from the TDEQ-P and associated open ended questions was useful and allowed a greater depth of feedback, which is both evidence-based (TDEQ-P) and more context specific (open ended questions). Indeed, we recommend this mixed methods approach in similar research and applied work with the original TDEQ (Martindale et al., 2010) and TDEQ-5 (Li et al., 2015), which targets athlete feedback. As part of a

360-degree feedback process, this information could be highly valuable for coaches and NGBs to reflect upon and act as necessary (Tee & Ahmed, 2014). Hall et al. (2019) have successfully conducted this type of process within elite contexts using athlete feedback gleaned from the TDEQ (Martindale et al., 2010). Future work could investigate whether athlete or parent feedback, or a combination, would add most value to this reflective cycle (e.g., Sargent Megicks et al., 2023). Of course, there are additional positive potential outcomes from using parents in this process. These may include a mechanism to facilitate a better understanding of parents' opinions, increased engagement, communication with and integration of parents, as well as a structured, formal way to facilitate education opportunities about effective TDEs. Indeed, Harwood et al. (2019) point out that opportunities which facilitate parent-coach collaboration as well as parent and coach education could be powerful, as could the development of strong trusting relationships (e.g., Jowett & Timson-Katchis, 2005). The implementation of the TDEQ-P provides one potential mechanism to achieve this.

The need for NGBs, clubs and coaches to have clearer strategies to engage, empower, and raise parents' profile within sport has been identified (Harwood et al., 2019). These authors outline that much of the research over the past 25 years has been investigation *of* parents rather than research *with* parents. Furthermore, very little research that does investigate parents' opinion does so related to their feedback on coaching practice per se (e.g., Beldon & Walker, 2022), and if it does, often focusses on specific challenges (e.g., emotional abuse, Kerr & Stirling - 2012; hidden disability, Vargas et al., 2019). This work provides a mechanism which could help to provide a platform for a more integrated, valued role for parents in the sport development process, as well to improve much needed communication and education. It would be interesting for future research to evaluate the extent to which the TDEQ-P could facilitate coach-parent communication, coherence, relationships, education of the sport development process, as well as help inform the improvement of TDEs across National sporting landscapes.

Funding

This research was enabled through funding by **sport** scotland as part of a larger project of parents of pathway athletes (Project ID 1816169). APA ethical standards were followed in the conduct of the study, and we received approval from the Edinburgh Napier University ethics committee.

Declaration of competing interest

None.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.psychsport.2023.102487.

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