Coaches and parents hold contrasting perceptions of optimal youth development activities in track and field athletics

PHILIP E. KEARNEY¹,³*, THOMAS M. COMYNS¹,³, & PHILIP R HAYES²

¹Department of Physical Education and Sport Sciences, University of Limerick, Limerick, Ireland;
²Department of Sport, Exercise and Rehabilitation, Northumbria University, UK
³Health Research Institute, University of Limerick, Limerick, Ireland

*Correspondence concerning this paper should be addressed to Philip E. Kearney, Department of Physical Education and Sport Sciences, University of Limerick, Limerick, Ireland. E-mail: kearneype@gmail.com.
Abstract

This study examined track and field coaches’ and parents’ knowledge of: (a) the relationship between adolescent and later success, (b) factors contributing to adolescent success, particularly in relation to relative age effects, and (c) optimal athlete development practices, such as the timing of sport specialisation. Fifty two coaches and 116 parents completed a survey comprising both closed and open questions. Compared to coaches, parents were more likely to believe that successful adults had achieved success during early adolescence, and to connect that success to innate ability rather than relative development. However, there was no difference in the proportion of parents and coaches who reported familiarity with the relative age effect (approximately 50%). The most pronounced differences between coaches and players were in relation to optimal youth development practices, with parents more likely to encourage year round training at an earlier age, and specialising in a single sport at an earlier age. Contrasting the knowledge reported by coaches and parents with the results of quantitative studies of youth development suggests that bespoke education is required for both groups. Furthermore, the explanations provided by parents and coaches for their beliefs about youth sport practices suggest that professional bodies need to provide more nuanced instruction to stakeholders on how to implement general guidelines on healthy youth sport practices into their individual practice.

Keywords: youth sport; sport specialisation; relative age effect; knowledge; sport volume
Introduction

A range of professional bodies have expressed concern about an apparent increase in inappropriate youth sport practices, such as engagement in intensive training before the young person is ready\(^1\),\(^2\). Parents and coaches are believed to encourage such inappropriate youth sport practices due to the misconception that a high level of achievement at youth level predicts adult success\(^3\). However, a range of studies have established that performances at youth level, particularly during childhood and early adolescence, have little bearing on an individual’s potential to succeed in adult level sport\(^4\),\(^5\). For example, Boccia and colleagues\(^4\) reported that only 17% to 26% of top-level Italian adult track and field athletes were considered as such when they were 14 to 17 years of age. Similarly, Kearney and Hayes\(^5\) reported that only 9% (male) to 13% (female) of top 20 ranked senior track and field athletes from the United Kingdom were also ranked in the top 20 for their age grade when they were 12 years of age. In order to promote healthy youth experiences within sport, there is a need to identify the specific beliefs held by youth sport coaches and parents about the factors contributing to success at both youth and adult levels\(^6\),\(^7\).

Success at youth level is due to the complex interaction of a wide range of individual and environmental factors\(^8\). For example, observations of athlete behaviours during practice reveal that more effective learners utilise enhanced self-regulatory skills\(^9\). Coach effectiveness is also a critical factor\(^8\), with multiple studies indicating that coaches differ in the quality of their planning\(^10\), observation\(^11\), and practice behaviours\(^12\). The extent and nature of parental involvement has also been shown to play a key role in youth athletes’ development\(^13\). In addition, children and adolescents vary widely in the rate and timing of their maturation\(^14\), with consequences for sporting success during adolescence. A proportion of coaches and parents are
believed to falsely equate early maturation with potential for future success, leading to an over-representation of early maturing athletes within youth high performance training squads. Such beliefs may also contribute to the enhanced competition success for athletes born shortly after the cut-off date for youth age categories (termed the relative age effect). Specifically, individuals born in the first quarter of the year are more likely to be selected to training camps or to achieve national top 20 ranking than their later born peers. Understanding this wide range of factors which contribute to success during adolescence is important for the design of optimal athlete development environments.

Considerable research has attempted to identify the optimal developmental activities for youth athletes. The activities examined within such research include: the age at which athletes initiate sport; single versus multi-sport participation; the extent to which activities place a primary emphasis on play/immediate enjoyment versus practice/improvement; and the frequency and nature of competition. It appears that athletes follow a diverse range of nuanced pathways to expertise. For example, Storm et al.’s analysis of the development of elite Danish athletes emphasised the variation present in the ages at key transition points, the manner in which different sports were sampled, and the precise nature of practice at different phases of development. Reflecting these findings, the International Olympic Committee’s consensus statement on youth sport concluded with broad recommendations on optimal development activities; specifically, children were encouraged to initially participate in a variety of different unstructured and structured age-appropriate sport-related activities, before gradually progressing towards a more adult-like pattern of sport participation in a flexible, individual-specific manner.

While the International Olympic Committee’s consensus statement represents an important source of guidance for coaches and parents, the design of effective interventions to
support the coaching process also requires an understanding of current coach and parent knowledge and practice\textsuperscript{24}. For example, coaches are primarily responsible for the transition into intensive training\textsuperscript{25}, and are a key influencing variable on athletes' adherence to guidelines\textsuperscript{26}. A growing body of research has explored coaches\textsuperscript{7, 27, 28} and to a lesser extent parents\textsuperscript{6, 29} knowledge of factors relating to optimal youth development in sport. Post et al.\textsuperscript{7} identified that coaches were concerned about specialisation, but largely unaware of the guidelines that their athletes were supposed to be following. Specifically, only 14.6\% of basketball coaches surveyed were aware of the NBA/USA Basketball Youth Guidelines, and only 31.8\% of baseball coaches correctly answered questions regarding the Pitch Smart Guidelines\textsuperscript{7}. Across all sports, only 11\% of respondents correctly identified the guidelines endorsed by the American Academy of Pediatrics and the American Orthopedic Society for Sports Medicine regarding the maximum number of months per year that players should be engaged in their sport (8 months)\textsuperscript{7}. Similarly, Bell et al.\textsuperscript{6} identified that while 55\% of parents surveyed considered sport specialisation to be a problem in youth sport, over 80\% had no knowledge of sport volume recommendations in relation to hours per week, months per year, or simultaneous participation in multiple leagues.

Identifying the specific shortcomings in coach and parent knowledge is vital to inform economical educational initiatives.

Parents and coaches make specific and evolving contributions to young athletes’ development\textsuperscript{30-32}, and a young athlete has a greater chance of success if all stakeholders’ views are aligned\textsuperscript{33, 34}. Research in the context of junior performance tennis revealed that stakeholders only weakly agreed with the findings of research on core principles of talent development (early specialisation and selection; role of practice; role of athlete development; relationship between junior and adult success; the role of stakeholders)\textsuperscript{33}. Furthermore, there was a lack of coherence
in each group’s understanding of what the other stakeholders believed. For example, in response
to sport specialisation and selection, coaches indicated that they supported the research view, but
felt that parents did not. In contrast, parents answered that they supported the research view, but
that coaches did not. Such a lack of coherence may compromise the quality of a young athletes’
development.\textsuperscript{34}

The majority of research into coach and parent beliefs in relation to sport specialisation
has been conducted in the United States of America. There is a need for additional research to be
conducted in other jurisdictions, with differing youth sport cultures.\textsuperscript{35} Culture refers to “a set of
ideas shared by members of a group”; within the context of youth sport, such shared ideas
might relate to traditional sports with their associated practices and seasons, the general emphasis
on sport for all versus high performance sport, or key characteristics of national culture.\textsuperscript{36-38} The
recent publication of research on the development of youth track and field athletes in the United
Kingdom based on performance databases\textsuperscript{5,18,39,40} offers an ideal opportunity to compare the
reality of athlete development to coach and parent perceptions of athlete development.

Consequently, this study aimed to identify track and field coaches’ and parents’ knowledge of:
(a) the relationship between youth and later success, (b) factors contributing to youth success,
particularly in relation to relative age effects, and (c) optimal athlete development practices,
particularly in relation to sport specialisation.

Method

Design

This study utilised a descriptive cross sectional design. Ethical approval was obtained
from the local University Research Ethics Committee.

Participants
Fifty two coaches and 116 parents completed the survey. Inclusion criteria for coaches were that they were currently coaching athletes aged between 10 and 19 years old. Inclusion criteria for parents were that their children were: (a) aged between 10 and 19 years and (b) were currently competing in athletics. Table 1 provides an overview of the demographic information provided by the respondents.
Table 1.  
Participant demographic information

<table>
<thead>
<tr>
<th>Measure</th>
<th>Levels</th>
<th>Coach (N=52)</th>
<th>Parent (n=116)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
<td>N</td>
</tr>
<tr>
<td>Age</td>
<td>48.6 (13.7)</td>
<td>47.4 (7.3)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>46</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Experience as an athlete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>14</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>7</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Club</td>
<td>14</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Youth</td>
<td>4</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>11</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Age of athletes*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 11</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Under 13</td>
<td>21</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Under 15</td>
<td>35</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Under 17</td>
<td>32</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Under 20</td>
<td>32</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Senior</td>
<td>18</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Years experience (as coach or parent in athletics)</td>
<td>14.8 (13.1)</td>
<td>5.4 (2.9)</td>
<td></td>
</tr>
<tr>
<td>Holding coaching qualification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3+</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holding other relevant qualifications</td>
<td>None</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Basic (e.g., other sport level 1)</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced (e.g., PE teacher; MSc Coaching)</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekly hours coaching</td>
<td>9.7 (7.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coaching single/multiple event groups</td>
<td>Single</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Level of athletes coached in the last three years</td>
<td>National/Regional finals at u13/u15</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Local level</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not coaching u13/15</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children involved in athletics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3+</td>
<td>13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *Typically participants coached across multiple age groups
Survey Development

The development of the survey was guided by specific design steps (e.g., expert review, pilot study) and considerations (e.g., organization of questions by topic, sequencing of topics, question types), reflecting recommendations for developing surveys\textsuperscript{41, 42}. The lead author developed the initial survey, based upon recent quantitative analyses of the development of track and field athletes within the United Kingdom\textsuperscript{5, 18, 39, 40}. The primary findings from these studies that informed question design were: (a) that only a small minority of successful senior athletes had been successful as youth athletes; (b) the typical season length reported by youth athletes; (c) the typical engagement in multiple event groups reported by youth athletes; and (d) the influence of relative age on performance within youth athletics. The draft survey was reviewed by two academics, each with over 20 years’ experience lecturing in sports coaching. Subsequently, a pilot test was completed which involved two track and field coaches, both of whom had above 25 years coaching experience, and six parents, who had been involved in athletics as parents for between 2 and 5 years. In addition to completing the survey, both the coaches and the parents were interviewed to suggest any alterations to the survey. The main adjustments made were to alter the order of the questions, and to split one question into two.

The final version of the survey was composed of four sections and between 18 (parents) and 24 (coaches) questions, depending upon the respondent’s answers. The questions in section one focused on demographic information. All respondents were asked about their age, gender, experience (as coach or parent) and whether they had competed as an athlete. Coaches were also asked about: their coaching qualifications; other relevant qualifications; and the age groups, events, and skill levels of the athletes they coached. Parents were also asked about: how many of their children were involved in athletics; what events their children were involved in; and the
level at which their children competed. The second section was composed of four questions focused on the relationship between success at the different age grades present in competition in the United Kingdom (U13, U15, U17, and U20) and adult success. The third section was composed of four questions focused on optimal practices for development in relation to multi-sport participation, multi-event participation, the focus of practice sessions (immediate enjoyment vs. long term improvement), and year-round engagement in the sport. The final section focused on factors responsible for youth success. One open question asked participants to identify the three factors most responsible for youth success. A second question assessed knowledge of relative age effects, with three follow up questions for respondents who suggested that relative age impacted youth athletic performance. Sections 2-4 also contained optional questions where participants could provide a reason for their responses. A copy of the survey is available from the lead author.

Procedure

As the population characteristics of parents and coaches was not known, a convenient sample was recruited. The survey was distributed in two ways. A link to an online survey tool (Bristol Online Survey, www.onlinesurveys.ac.uk) was promoted via social media (Twitter). This online survey was active for four months. Secondly, hardcopies of the survey were distributed to individuals attending one county age group championships and one national age group championships. These championships were chosen as we were focused on parents and coaches of athletes engaged in competitive rather than recreational sport. At these championships, potential participants were approached and asked if they wished to hear about the survey. Those who indicated that they were interested were given a choice between a
Data Analysis

The responses from the closed questions were entered into SPSS v24 and descriptive statistics calculated. As the ratio level data (e.g., percentage top senior athletes achieving success at youth age grades) was not normally distributed, Holm-Bonferroni corrected Mann-Whitney U tests were used to examine differences between coaches and parents. Pearson’s r was used to provide a measure of effect size. Chi-squared tests were used to analyse the categorical data (e.g., proportion of parents and of coaches aware of the relative age effect), with Cramer’s V providing a measure of effect size.

A two-step inductive content analysis was used to analyse the responses to the open-ended questions. In the first step, meaning units were identified within the responses, and each meaning unit was coded with a provisional code describing the topic. Once all responses had been coded, the codes were reviewed and refined for consistency (i.e., each item within a code refers to the same concept) and exclusivity (i.e., no overlap between codes). In the second step, codes with similar meanings were grouped together, and a new label generated which summarised the identity of that group of codes. To enhance the quality of the coding process, during both steps an independent researcher acted as a “critical friend”, challenging and developing the interpretations of the lead author.

Results

Perceptions of the relationship between adolescent and later success

The perceived relationship between adolescent and adult success was examined by asking respondents to indicate what percentage of top performing senior athletes they believed had
experienced success at each age grade from U13 through to U20. Participant median responses are illustrated in figure 1. Holm-Bonferroni corrected Mann-Whitney U tests revealed that parents believed that a higher percentage of top ranked seniors had been successful at youth level compared to coaches: U13, $Z = 4.82, p < 0.001, r = 0.39$; U15, $Z = 4.42, p < 0.001, r = 0.36$; U17, $Z = 4.05, p < 0.001, r = 0.33$; U20, $Z = 4.15, p < 0.001, r = 0.34$.

Figure 1. Coaches’ and parents’ perceptions of the percentage of current top 20 ranked senior athletes ranked in the top 20 at each age grade during their youth participation.

Qualitative comments provided to rationalise answers to this question were grouped into three themes. Both coaches and parents suggested that dropout, due to a variety of reasons, was responsible for the low percentage of U13s and U15s who were also high performing senior athletes: “There is a big dropout at U20 due to work, college and relationships. Also injuries are more severe at that age and only those with a strong mentality will continue” (Participant 36; coach); “I am aware of a significant drop off for young athletes from the sport for various reasons. Such as competing priorities, lack of development or success, injury, loss of interest in
the sport” (Participant 109; parent). The second reason provided by both coaches and parents was that many successful seniors were relatively late entrants to the sport: “I understand many top athletes are discovered at university level - often participating in other sports first” (Participant 140; parent): “I think the top ranked athletes have always been good at sport but not necessarily in athletics” (Participant 38; parent). Finally, both coaches and parents described how early advantages, due to early development or early specialisation, wash out over time resulting in different individuals achieving success: “children grow and develop at different rates - a fully grown U13 might peak at age 12 whereas a later developer would have success later” (Participant 79; parent); “most early bloomers, due to genetics, find the desire and hard work required as they mature onto a more level playing field, less appealing after their successes at junior level” (Participant 67; coach). Thus, although there were differences between coaches and parents in terms of the quantitative predictions of all respondents, those parents and coaches who were able to provide a rationale for their answers were largely in agreement.

**Perceptions of factors contributing to youth success**

Analysis of the factors that participants identified as being primarily responsible for success in youth track and field competitions are presented in Table 2. The five most commonly reported themes were shared by parents and coaches, although the order in which themes appeared differed. Items clustered under the theme ‘Attitude, Dedication and Desire’ were the most commonly reported by both coaches and parents (e.g., “Personal drive/attitude”; “Dedication to training”). The most pronounced difference was with respect to ‘Relative development’; example statements include “Physical development for age” and “Physically mature for their age”. While 19% of coaches identified this factor within their top three, only 8% of parents did so. Parents were also more likely to suggest the ‘Coach’s influence’ (e.g.,
“Quality coaching”, “Access to a coach”) and ‘Ability’ (e.g., “Genetics”, “Natural ability”) as key contributory factors in youth success compared to coaches.

Table 2

Parent and coach perceptions of the factors primarily responsible for athlete success in youth track and field competitions

<table>
<thead>
<tr>
<th>Theme</th>
<th>N factors</th>
<th>% factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude, Dedication and Desire</td>
<td>81</td>
<td>23.7</td>
</tr>
<tr>
<td>Coach Influence</td>
<td>63</td>
<td>18.4</td>
</tr>
<tr>
<td>Ability</td>
<td>61</td>
<td>17.8</td>
</tr>
<tr>
<td>Family environment</td>
<td>39</td>
<td>11.4</td>
</tr>
<tr>
<td>Relative development</td>
<td>27</td>
<td>7.9</td>
</tr>
<tr>
<td>Training history</td>
<td>26</td>
<td>7.6</td>
</tr>
<tr>
<td>Social Environment</td>
<td>18</td>
<td>5.3</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>9</td>
<td>2.6</td>
</tr>
<tr>
<td>Unspecified environmental feature</td>
<td>8</td>
<td>2.3</td>
</tr>
<tr>
<td>Physical Environment</td>
<td>6</td>
<td>1.8</td>
</tr>
<tr>
<td>General athleticism</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Technical competence</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Miscellaneous factors</td>
<td>1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Theme</th>
<th>Parent</th>
<th>Coach</th>
<th>Parent</th>
<th>Coach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude, Dedication and Desire</td>
<td>35</td>
<td>19</td>
<td>18.4</td>
<td>12.5</td>
</tr>
<tr>
<td>Coach Influence</td>
<td>19</td>
<td>12</td>
<td>11.4</td>
<td>7.9</td>
</tr>
<tr>
<td>Ability</td>
<td>18</td>
<td>12</td>
<td>7.9</td>
<td>19.1</td>
</tr>
<tr>
<td>Family environment</td>
<td>12</td>
<td>9</td>
<td>7.6</td>
<td>6.6</td>
</tr>
<tr>
<td>Relative development</td>
<td>29</td>
<td>26</td>
<td>5.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Training history</td>
<td>10</td>
<td>7.6</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Social Environment</td>
<td>5</td>
<td>5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>8</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unspecified environmental feature</td>
<td>2</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Environment</td>
<td>5</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General athleticism</td>
<td>5</td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical competence</td>
<td>2</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous factors</td>
<td>2</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Each participant was asked to identify three factors responsible for success.

While less than one fifth of coaches or parents identified relative development as a factor primarily responsible for youth success in response to the open question, figure 2 illustrates that approximately half of parents and coaches were aware of the relative age effect when explicitly asked about it. There was no significant different in knowledge between groups; $\chi^2 = 0.597$, $p = 0.742$, $V = 0.06$. Both parents and coaches connected this advantage to additional growth relative to their later born peers; for example:

In a child 6-11 months older than a competitor can make a significant difference in physical growth and strength (height and leverage) i.e., a September baby has an advantage over a Summer baby with regard to how age groups in athletics are grouped (Participant 31; coach)
Almost a year older than some in the same year group. Would be more developed mentally & physically than younger children (Participant 26; parent).
Figure 2. Parents and coaches’ response to the question asking if date of birth influenced success in youth track and field (a); perceptions of which age grades are most impacted by relative age effects (b); and perceptions of which event groups are most effected by relative age effects.
Figure 2 further illustrates that of those parents and coaches who were aware of the relative age effect, the majority perceived that the effect was most prominent between U11 and U15. Furthermore, both coaches and parents predominantly perceived that relative age effects were most prominent in the sprints, jumps and throws, and least prominent in the middle distance events.

**Perceptions of optimal development activities**

Table 3 presents information relating to beliefs about optimal developmental activities for adolescent athletes. Coaches’ and parents’ beliefs about when athletes should begin year round training for track and field athletics differed, $\chi^2 = 29.73$, $p < 0.001$, $V = 0.42$. The majority of parents (37.4%) reported that youth athletes should start year round training at U15. In contrast, the majority of coaches (46.2%) advocated year round training beginning at U17. However, 21% of parents advocated beginning year round training at U13 and a further 8% advocated starting at U11; only 8% of coaches recommended beginning year round training at U13 or earlier.
Table 3

Parent and coach perceptions of optimal development activities for youth athletes

<table>
<thead>
<tr>
<th>Age Grade</th>
<th>U11</th>
<th>U13</th>
<th>U15</th>
<th>U17</th>
<th>U20</th>
<th>Senior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at which athletes should start training year round*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Parent</td>
<td>7.8</td>
<td>20.9</td>
<td>37.4</td>
<td>29.6</td>
<td>4.3</td>
<td>0</td>
</tr>
<tr>
<td>% Coach</td>
<td>3.8</td>
<td>3.8</td>
<td>19.2</td>
<td>46.2</td>
<td>26.9</td>
<td>0</td>
</tr>
</tbody>
</table>

Age at which athletes should specialise in one sport*

| % Parent | 0.9 | 2.6 | 27 | 37.4 | 20.9 | 11.3 |
| % Coach | 0 | 1.9 | 5.8 | 38.5 | 40.4 | 13.5 |

Age at which athletes should specialise in a single event

| % Parent | 0.9 | 10.1 | 17.4 | 39.4 | 26.6 | 5.5 |
| % Coach | 0 | 2.1 | 10.4 | 43.8 | 35.4 | 8.3 |

Percentage (Mdn, IQR) of practice which should prioritise enjoyment rather than improvement

| Parent | 90 (20) | 70 (20) | 50 (20) | 30 (30) | 20 (30) | 20 (25) |
| Coach | 90 (20) | 75 (20) | 60 (20) | 40 (20) | 25 (25) | 10 (30) |

Note: *Significant difference between the views of coaches and parents. Mdn = median. IQR = Inter-quartile range.

Reasons for when to begin year round training were broadly similar between coaches and parents, and focused on three key themes. The first concern was that the decision be based upon individual characteristics such as maturation or engagement in other sports rather than age:

“Very hard to generalise on this. Different individuals have different development tracks - physical/psychological/motivational” (Participant 53; coach); “A lot can depend on particular growth of individual. All athletes develop at different stages” (Participant 136; parent);

“Depends on other sport participation. Example a competitive road cyclist could do that in summer and cross country running in winter. Endurance development would be sustained, athlete would have variety” (Participant 35; coach).

The second theme was that year round training could be appropriate during early adolescence provided it focused on general training, delivered through fun activities and games,
and was of an appropriate intensity: “General training younger than U15 is fine, but not specific event training alone” (Participant 46; coach); “I believe you MUST start training for your event as early as possible. However the training at a young age MUST also be very fun and not completely technique based as to avoid athlete burnout” (Participant 28; coach); “can start earlier without adverse effect if intensity not too high” (Participant 47; parent).

The final theme related to the respondents’ different conceptualisations of track and field athletics. Two coaches described how athletes typically peaked late in their development (“athletics is shown to be a late development sport”, Participant 62), while three parents and one coach emphasised the advantages of early year round engagement (“earlier you start the better”, Participant 152).

The majority of coaches advocated specialisation in one sport in late adolescence (U17 or later), with the largest percentage (40.4%) recommending specialising during the U20 age grade. Parents were more likely to recommend specialisation within early adolescence (30.4% recommending specialisation at U15 or earlier); \( \chi^2 = 13.14, p = 0.004, V = 0.28 \). Although Table 3 reveals that the pattern of results for specialising in a single event within athletics was similar to the results for between sport specialisation, the distributions were not significantly different; \( \chi^2 = 5.01, p = 0.082, V = 0.18 \).

No qualitative comments were provided to rationalise between- or within-sport specialisation at U13 or younger, while the only comments that were provided to support specialisation at U15 either suggested that continued engagement in “complimentary” sports was acceptable, or emphasised the need to experience a range of sports before that point: “can continue some other sports if complimentary to athletics training eg swimming” (Participant 32;
PERCEPTIONS OF OPTIMAL YOUTH DEVELOPMENT ACTIVITY

337 parent); “youths should have time to experience a range of sports and so specialise too early
338 would not allow that” (Participant 146; parent).
339
The majority of comments related to the benefits of multi-sport and/or multi-event
340 participation up to at least late adolescence. Reported benefits of multi-sport included general
341 conditioning, personal development, prevention of injury, prevention of staleness, and keeping
342 an individual’s sporting options open: “Keep all doors open. Physical skills are transferable
343 across sports disciplines” (Participant 60; parent); “I think it is important to maintain a healthy
344 interest in other sports and even at the stage when a specific athletic event becomes the athletes
345 focus; doing other activities can help recovery and prevent staleness” (Participant 48; coach); “I
346 think young athletes should experience a variety of sports to develop as a person as well as an
347 athlete. I also believe that it helps developing different group muscles and prevent injuries”
348 (Participant 166; parent). However, both parents and coaches indicated that the additional sport
349 needed to compliment track and field: “if the other sport is complimentary, especially if non
350 contact, it may be useful to keep some aspects of the training if time permits” (Participant 67,
351 coach); “swimming is good for recovery so would not recommend giving up” (Participant 21,
352 parent). Similarly, multi-event participation was seen as keeping an athlete’s options open,
353 reducing the risk of injury, facilitating being part of a team, and avoiding demotivation if
354 performances stagnated. However, one coach emphasised that balance should be achieved
355 across sports, not just within sports:
356
it doesn't mean they must do different kinds of athletics such as jumps and throws as well
357 as running if they like running. Kids can do other sports BESIDES [emphasis
358 respondent’s] athletics such as cycling, swimming, rugby. So they shouldn't be forced
into doing hurdles and jumps if they don't want to do it just to please the multi event enthusiasts whose horizons don't extend beyond the athletics arena (Participant 34; coach)

Finally, participants were asked to indicate the extent to which they believed that training sessions should emphasise immediate enjoyment or improvement. Table 3 illustrates that both coaches and parents emphasised immediate enjoyment at younger ages, gradually shifting to a primary emphasis on improvement at later age grades. A balanced approach was recommended by both parents and coaches, however, in that some emphasis on both immediate enjoyment and on long term improvement was deemed appropriate at all age grades. As the data was not normally distributed, Bonferroni-Holm corrected Mann Whitney U tests were used to compare the values reported by coaches and parents; as the initial critical value was $p = 0.008 (0.05/6)$, no significant differences were apparent: $U_{11}, Z = 2.06, p = 0.039, r = 0.13; U_{13}, Z = 1.70, p = 0.090, r = 0.20; U_{15}, Z = 2.57, p = 0.031, r = 0.16; U_{17}, Z = 0.898, p = 0.369, r = 0.07; U_{20}, Z = 0.473, p = 0.363, r = 0.07; Senior, Z = 0.867, p = 0.386, r = 0.04.$

Three themes emerged from the qualitative comments relating to the emphasis on immediate enjoyment versus long term improvement. Firstly, both coaches and parents discussed the reciprocal relationship between enjoyment and improvement: “enjoyment = motivation = dedication = performance” (Participant 130; parent); “may not enjoy if don’t improve, will not improve if don’t enjoy” (Participant 95; coach); “Enjoyment is essential to improvement, and to retain an athlete in the sport” (Participant 54, coach). Secondly, both parents and coaches commented that serious activities can still be fun: “the right exercise can be enjoyable and promote improvement” (Participant 124, parent); “serious activities can still be fun especially in a good training group” (Participant 115, coach). Finally, both parents and
coaches highlighted that the ratio of playful activities: serious practice was individual dependent:

"Within the younger groups there will be some athletes who require more play than
development, but also there will be some who require more development than play" (Participant
18, coach); “Depends hugely on the individual child and their attitude. Some young children
know running training is for improvement and do not need the distraction of games as they enjoy
their training anyway” (Participant 32, parent).

Discussion

Coaches and parents were found to hold differing perspectives in relation to optimal youth
development in track and field athletics. Compared to coaches, parents were more likely to
believe that successful adults had achieved success during early adolescence, and to connect that
success to innate ability rather than relative development. However, there was no difference in
the proportion of parents and coaches who reported familiarity with the relative age effect
(approximately 50%). The most striking differences between coaches and players were in
relation to optimal youth development practices, with parents more likely to encourage year
round training at an earlier age, and giving up other sports at an earlier age. Qualitative responses
revealed nuanced views relating to specialisation in youth sport.

Coaches’ beliefs about the proportion of successful adults who were also successful at the
Under 13 and Under 15 age grades were in line with research which has examined the
relationship between adolescent and later success in the context of track and field athletics. Conversely, relative to the results of Kearney and Hayes, coaches tended to underestimate the
proportion of older adolescents who were successful at U17 and U20 and who then progressed to
national senior success. However, coaches’ conservative predictions were in line with older
studies that examined the progression of world junior finalists. For example, Pizzuto et al.
found that 42.7% of finalists in the middle and long-distance events at the World Junior Championships were considered as dropouts from high-level performance two years later. Thus it appears that coaches’ generally hold accurate perceptions about the relationship between youth and adult success.

In contrast to coaches, parents’ tended to over-estimate the proportion of successful adults who were also successful as young adolescents. A closer examination of the qualitative comments revealed that those respondents (all parents) who suggested that a high proportion of successful U13s would progress to success at senior level did not provide any rationale for their answer. As documented in the results section, parents who could provide a rationale were likely to provide answers consistent with a weak relationship between youth and later success. Thus, it appears that additional educational initiatives are required to inform parents of the weak relationship between performances during early adolescence and subsequent success.

These educational initiatives should focus on addressing parents' beliefs about the factors contributing to youth success. The fact that less than 20% of parents and coaches identified relative development as a key factor in youth success, and that only 50% were familiar with the relative age effect, suggests that increased emphasis on relative development is required in parent and coach education. Research has consistently identified an over-representation of early maturing athletes in a range of high performance youth squads, including track and field. The false equation of early maturation with potential for future success is suggested to be one of the reasons why relative age effects appear so prominently in youth sport and in track and field in particular. However, simply raising awareness of differences in relative development is unlikely to be sufficient to change behaviour. Policy changes such as age restrictions on when athletes could be invited to selection events, the use of alternative supplemental competition...
structures (e.g., bio-banding\textsuperscript{52}) or additional supports such as corrective-adjustment procedures\textsuperscript{53}, or allocating uniform numbers on the basis of relative age or maturation status\textsuperscript{50} are likely to be required to assist parents and coaches in addressing maturation-related issues in youth sport. Due to the use of objective outcome measures in track and field (i.e., time, distance), corrective performance adjustments may be a particularly appropriate strategy to better inform coaches, parents and athletes themselves when evaluating performance. Coaches, clubs and federations need to reflect on how these strategies might be implemented within a track and field context\textsuperscript{55}.

Educational initiatives should also focus on identifying healthy youth sport practices. Both parents and coaches advocated an overall framework for youth sport in which the primary emphasis within training gradually shifted from immediate enjoyment (i.e., deliberate play\textsuperscript{56}) to long term improvement (i.e., deliberate practice\textsuperscript{57}). This gradual change in emphasis is consistent with analyses of the developmental pathways of successful athletes\textsuperscript{19,20,58}. However, examining more specific elements of the youth sport experience, significant differences between the views of parents and coaches were revealed. Specifically, parents believed that athletes should (a) begin training year round for a sport, and (b) specialise in a single sport, at a younger age than advocated by coaches. These findings are consistent with previous research showing that the recommendations associated with youth sport participation are not well known by parents\textsuperscript{6,29}. Year round engagement in training for one sport and premature specialisation in a single sport are two factors which are suggested to increase an athlete's risk of injury and/or burnout\textsuperscript{59,60}. Consequently, a range of professional bodies have proposed guidelines to assist parents and coaches to implement healthy youth sport practices\textsuperscript{1,2}. Such guidelines should form the basis for educational initiatives aimed at promoting healthy engagement in youth sport.
While the professional body guidelines provide appropriate general advice, the explanations provided by parents and coaches for their beliefs about youth sport practices suggest that more nuanced instruction is required on translating these general guidelines into individual applications. For example, and consistent with international recommendations, the United Kingdom Athlete Development Model advocates that season length should be restricted to approximately six months for 12 year old athletes, gradually increasing to year round training over the course of adolescence. In addition, the model recommends that the ideal developmental path for all athletes under 15 years of age is to engage in multi-event training and competition. However, and consistent with previous research, when explaining their rationale for the youth sport practices that they endorsed, several respondents offered nuanced interpretations of such broad recommendations. For example, several respondents suggested that year-round training within a sport such as track and field was not problematic at a young age so long the emphasis was on general rather than event specific training. One coach presented a particularly clear argument in favour of ensuring that a child had a balanced experience across different sports, rather than emphasising that a child experienced the full range of disciplines within track and field athletics. To date, there is a paucity of research examining nuanced features of optimal athlete development activities such as year-round training and single event specialisation within track and field athletics. While extensive research exists to illustrate that athletes can follow a diversity of pathways to expertise, additional research is required to explore the consequences of specific youth sport practices, so that more nuanced guidelines may be provided for parents and coaches.

For successful athlete progression, parents’ and coaches’ perceptions of optimal development activities need to be aligned. Consistent with previous research, this study...
found that parents and coaches may hold discrepant views relating to certain aspects of talent development. Thus, in addition to enhancing knowledge about effective talent development, educational initiatives should also emphasise how stakeholder coherence might be enhanced. To achieve this, educational workshops might focus on initiating and maintaining positive coach-parent relationships through considering issues such as coach selection, role clarity and communication strategies. Furthermore, the factors that influence youth sport outcomes vary depending upon the level of the sport (i.e., recreational versus competitive), as do the demands and roles of key stakeholders. Consequently, educational initiatives should be bespoke to the motivations of participants.

As the single largest predictor of sustained participation and sport commitment, enjoyment is one topic on which more detailed and more nuanced guidelines may be provided for parents and coaches. Enjoyment is a complex construct. For example, in Fun Integration Theory, Visek and colleagues have identified 11 fun dimensions (e.g., learning and improving, friendships, positive coaching) comprised of 81 specific fun determinants (e.g., learning new skills; being around your friends; having well-organized practices). Both coaches and parents showed a general appreciation for this complex conceptualisation of enjoyment by recognising the need to balance a focus on enjoyment and long term improvement at all ages, and through their qualitative comments on what constitutes enjoyment within track and field. An advantage of Fun Integration Theory as opposed to alternative models is the detailed framework it offers to further educate parents and coaches about the specific actions they can undertake to positively influence the youth sport experience. In particular, the theory’s fun maps provide a rich stimulus for discussion which might underpin coach education workshops.
A strength of this study was the explicit connection between the questions used in the survey, and recent quantitative analyses of the development of track and field athletes within the United Kingdom. However, this study has several limitations. Firstly, due to the desire to align the questions with previous research on this population, additional themes relating to youth sport practice such as training volume and intensity or the ratio of organized sports to free play time were not considered. Secondly, selection bias is an obvious concern with survey research. Both parents and coaches may have been more inclined to participate in the survey if they were concerned about the topic, or if they felt they held views consistent with national governing body policy. Finally, the use of a survey method limited the amount of detail that could be obtained on why parents and coaches believe what they believe. Obtaining a more in-depth understanding of the reasons underpinning parents’ and coaches’ beliefs and practice should prove beneficial in guiding the various educational initiatives proposed above.

**Conclusion**

In conclusion, coaches and parents were found to hold contrasting perceptions of optimal youth development activities in track and field athletics. Educational initiatives should focus on the relationship between youth and adult success, the role of relative development in youth success, and communicating the rationale underpinning healthy youth sport practices. However, research should also focus on developing a more detailed understanding of healthy youth sport practices to provide more nuanced guidance to practitioners.
References


40. Kearney PE and Hayes PR. Year-round engagement in track and field athletics during early adolescence is prevalent amongst endurance runners, but does not impact on athlete retention. *Poster presented at: European Congress of Sport Sciences*. Prague, Czech Republic2019 July 3-6.


