Sport Expertise Development:
Skill Level Differences in Practice Profiles During Childhood & Adolescence

Melissa J. Hopwood[1], Joseph Baker[2], Damian Farrow[1,3], & Clare MacMahon[1]

[1]Victoria University, Melbourne, Victoria, Australia, [2]York University, Toronto, Ontario, Canada,
[3]Australian Institute of Sport, Canberra, Australian Capital Territory, Australia

melissa.hopwood@live.vu.edu.au

Introduction

The relationship between practice and performance is well established with greater volumes of practice associated with superior performance in a variety of domains including chess (Simon & Chase, 1973), music (Ericsson, Krampe, & Tesch-Römer, 1993), and sport (see Starkes, 2000 for a review). Studies comparing practice history profiles between athletes of varying skill levels have typically categorised involvement into relatively broad practice types; for example, group and individual practice activities (Helsen, Starkes, & Hodges, 1998; Hodges, & Starkes, 1996), sport specific and fitness activities (Hodges, Kerr, Starkes, Weir, & Nananidou, 2004), or individual practice, team practice, and sport specific play (Ward, Hodges, Starkes, & Williams, 2007). Baker, Côté, and Abernethy (2003) examined skill level differences in participation in a wider range of more specific practice activities such as organised training, individual instruction with a coach, practice alone, and playing with friends; however, this investigation, along with the vast majority of studies relating to sport expertise development, involved a small number of athletes from a single country and few sports. To overcome limitations associated with sample size, generalizability, and depth of knowledge, the current study aimed to investigate skill level differences in practice history profiles within a large, diverse sample of athletes, exploring involvement in a range of practice activities, under a variety of practice conditions.

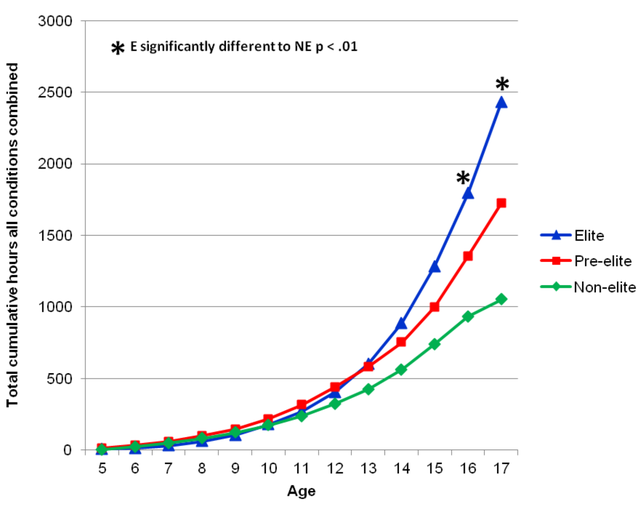
Methods

Participants included 209 Australian and Canadian athletes, aged 18-35, from 38 sports. Sports included both team and individual sports (for example volleyball and swimming), and both high and low participation sports (for example soccer and diving). Eligibility criteria required athletes to have reached the highest level of competition at which they expected to participate, allowing for classification into three skill groups: 1) Elite (E), including athletes who had competed at the senior international level; 2) Pre-elite (PE), including athletes whose highest level of competition was the senior national or junior international level; and 3) Non-elite (NE), encompassing all remaining athletes.

All participants completed the Developmental History of Athletes Questionnaire, requiring identification of time engaged in 15 types of practice throughout each year of their involvement in their main sport. Details of participation in sport specific physical practice, physical preparation, and mental preparation activities completed under group supervised, individual supervised, group unsupervised, and individual unsupervised conditions were collected, as were details of participation in sport specific play completed with others and individually. Details of attendance at training camps were also collected. Total hours per year and total cumulative hours of participation in each practice type were calculated, and skill level differences in practice history profiles were assessed via a series of one-way ANOVAs and Pearson chi-square tests for independence.

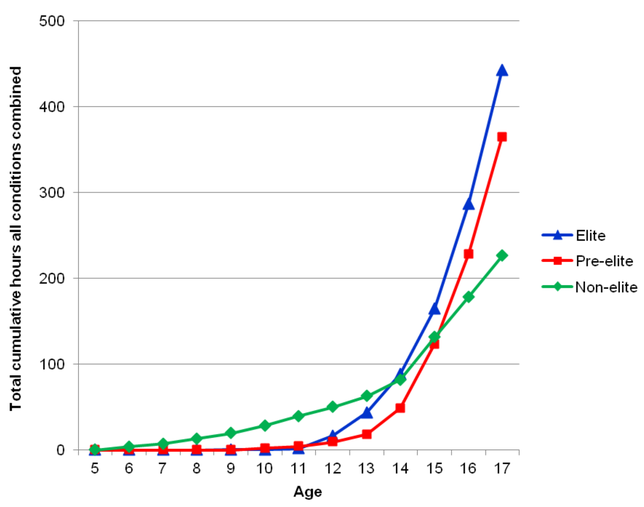
Results

Sport specific physical practice



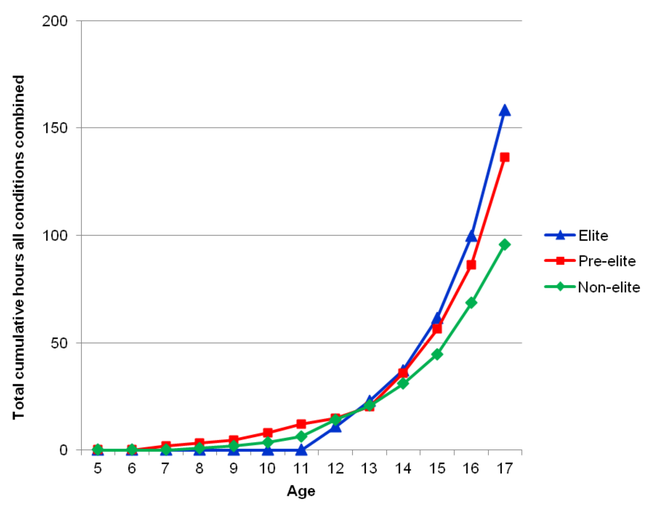
- **Group supervised**
  - E greater hours per year than NE from age 13 and PE from age 15
  - PE greater hours per year than NE from age 16
- **Individual supervised**
  - E more likely to have participated before age 18 than NE
  - E greater hours per year than NE and PE from age 15
- **Group unsupervised**
  - E greater hours per year than NE and PE from age 17
- **Individual unsupervised**
  - No skill level differences

Physical preparation activities



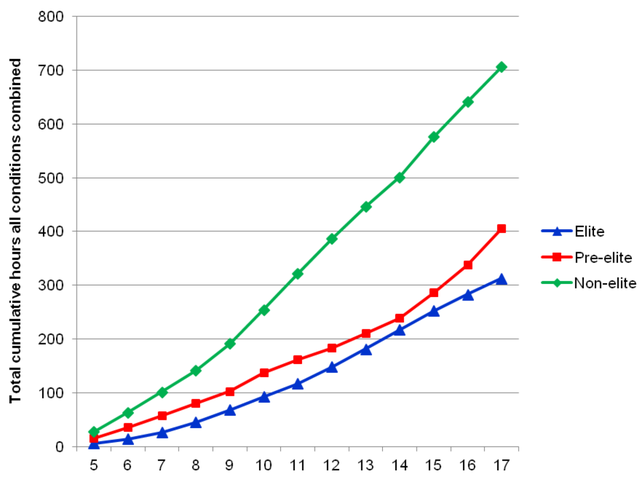
- **Group supervised**
  - E more likely to have participated before age 18 than NE
  - E greater hours per year than NE from age 15
- **Individual supervised**
  - E more likely to have participated before age 18 than NE
  - E greater hours per year than NE from age 17
- **Group unsupervised**
  - E more likely to have participated before age 18 than NE
- **Individual unsupervised**
  - E more likely to have participated before age 18 than NE

Mental preparation activities



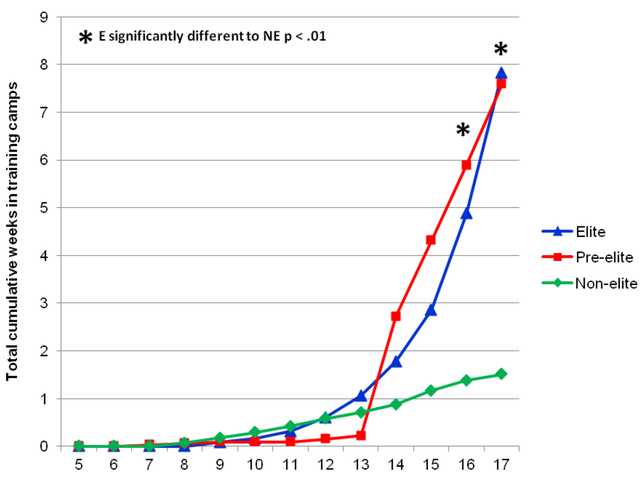
- **Group supervised**
  - E older at first participation than NE
  - No skill level differences for hours of participation
- **Individual supervised**
  - E more likely to have participated before age 18 than NE
  - E greater hours per year than NE from age 17
- **Group unsupervised**
  - No skill level differences
- **Individual unsupervised**
  - No skill level differences

Sport specific play



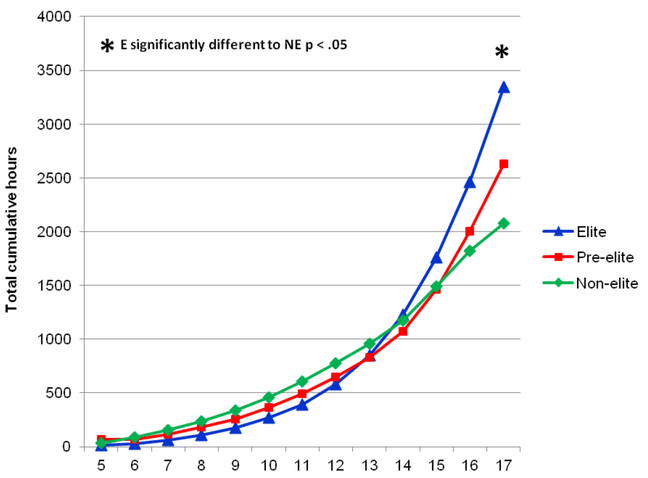
- No skill level differences for play completed in a group, on own, or overall
- NE greater hours per year than PE and E at all ages under both conditions, however, large variability precludes significance

Training camps



- E more likely to have participated before age 18 than NE
- E longer average duration of training camps than NE from age 13
- E more camps per year than NE from age 14 and PE from age 16

All practice types combined



- No skill level differences for age at first participation
- E greater hours per year than NE ages 14-17
- PE greater hours per year than NE age 17

Discussion

This study aimed to compare detailed practice history profiles between athletes of three skill levels in order to gain a more thorough understanding of the types of practice that are most strongly associated with sport expertise development. Several significant findings were observed. Elite athletes began to devote more hours to practice activities compared to lesser skilled athletes from approximately age 13. Sport specific physical practice and training camps were the two practice types for which significant differences were observed between all three skill groups. Additionally, elite athletes were more likely to have participated in physical preparation activities than non-elite athletes, and engaged in greater hours of this practice type under group and individual supervised conditions. Elite athletes were also more likely to engage in mental preparation activities than non-elite athletes, but among athletes who participated in this practice type, elite athletes did not typically begin until a later age than non-elite athletes. No significant skill level differences were observed for participation in sport specific play; however, there was a trend towards non-elite athletes participating in a greater volume of this practice type than elite athletes.

Conclusion

The results from this investigation suggest that large investments in practice activities before the age of 13 are not a necessary requirement for the development of sport expertise. After this age, elite athletes appeared to become more involved in their sport, devoting greater hours to sport specific physical practice and training camps compared to non-elite athletes, and by approximately age 15, elite athletes were also committing more time to these activities than pre-elite athletes. Additionally, although elite athletes were more likely to participate in physical and mental preparation activities than non-elite athletes, they did not typically begin to invest considerable amounts of time in these activities until late adolescence. These findings may be utilised to guide the design of developmentally appropriate youth high performance sport programs.

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