

BAKER, JOSEPH

York University

J. Fraser-Thomas, N. Wattie, P. Weir, S. Horton, J. Schorer

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A Level Playing Field? Bias in Canadian High Performance Sport

Project Summary

Sport is often extolled as a key activity for the development of healthy and productive youth as well as for the optimization of health and functioning across the lifespan. However, there is evidence that the delivery of sport and opportunities for participation in high performance (HP) sport is not uniform. For example, research indicates those from lower levels of socio-economic status (SES) are less likely to participate in sport and achieve high levels of competition. Furthermore, research suggests elite athletes are more likely to come from medium sized towns (as reflected in birthplace or community size effects) and to be born earlier in the selection year (as reflected in relative age effects) than their non-elite counterparts. In addition to these broader social and demographic factors, highly specific biases such as the over-representation of left-handers in many dynamic, interceptive sports highlights the depth and breadth of biases affecting HP athlete development. However, the extent of participation-biases across the Canadian HP sport system has not been fully documented.

This project involved a systematic evaluation of bias in the Canadian HP sport system to determine their effects on athlete outcomes. Based on prior work in this area, we considered well-known biases such as sex, age, relative age (i.e., age relative to ones peers for the basis of social comparisons), community size (i.e., population), socio-economic status, and handedness, as well as some exploratory analyses to identify biases that are currently unknown.

Research methods

This investigation explored a range of methods to achieve our objectives. In general, these included:

- 1) large-scale epidemiological analyses: To explore national trends for outcomes such as relative age effects, community size effects, and biases based on socio-economic and demographic factors we collected large databases of data available from public archives and other online sources. These data were then considered using a range of statistical techniques.
- 2) geographical analyses: We undertook a basic descriptive analyses of where Canadian HP athletes originated, which involved mapping athletes' place of early development to generate a national map of Canadian HP athletes. This was then compared across sports.
- 3) small scale experiments: In addition to the methods above, we explored the mechanisms that might explain several persistent effects including a) whether exposure to a greater proportion of right handed players might explain the dominance of left-handed athletes in dynamic, interactive sports and b) whether implicit biases of coaches might affect how athletes of different relative ages are evaluated, thereby promoting relative age effects.

Research results

Geographical and epidemiological analyses: The Canadian HP sport system continues to show signs of significant bias. For example, there are over-representations of males compared to females at all levels of competition. Our results also indicate that seemingly simple effects that have been identified in prior work are more complex than they initially appear. For example, community-size effects that appear straightforward on the surface (i.e., that athletes coming from areas with medium-sized populations are advantaged), fall apart when examined at provincial or regional levels suggesting the National level effects may be statistical artefacts that hide important data about geographical advantages and disadvantages for developing Canadian athletes. Similar results were noted for relative age effects emphasizing the pervasive and insidious influence on outcomes ranging from participation and achievement to career length and post-career occupations. However, there were also results suggesting athletes who are initially disadvantaged (i.e., relatively younger in most sports) develop into better performers at elite levels of competition. These results add nuance to the discussion of how relative age impacts athlete development and the justification for the system changes necessary to remove these effects.

Experimental analyses: Our initial examination of implicit bias within coaches' evaluations of young athletes of varying relative ages was inconclusive and requires further exploration. However, our experimental work on left-handed bias suggests these effects are entirely the result of training-specific advantages and, as a result, may be solved through practice adaptations (e.g., increased perceptual training against left-handers).

Policy implications

Some of the effects identified and explored in this study seem relatively easy to address through enhanced sport policy. For example, left-hander advantages can be accommodated through training-based adjustments that are communicated through updated coach-education programs. Unfortunately, others are more complex and difficult to address. Increased education and awareness of these biases would be valuable but this is almost certainly not enough. For instance, our recent analyses of changes in relative age effects over a 10-year period in elite European soccer showed that these effects persisted even as knowledge of the effect increased. However, our results indicate that many of these biases are 'system wide', highlighting limitations in the way HP sport is delivered to Canadians. While these might reflect explicit biases such as limiting opportunities to those in lower SES cohorts simply through 'fee for access' type programs, it is possible these biases reflect broader social messages that implicitly affect interest in, and motivation for, involvement in HP sport.

Next steps

There were several areas that require further exploration. First, the analyses were conducted were limited to linear and direct relationships and it is possible that these biases have a multiplicative effect (e.g., the effect of being female *and* from a low SES background may be greater than simply the two effects added together). Second, it was difficult to obtain objective SES data for many of our analyses and so this bias, which has been often noted as a critical social determinant of healthy behaviour like sports participation, remains under examined in HP sport research. Third, developing solutions to counter-act these effects is important but rarely explored. Such a task would require engagement from researchers as well as policy-makers and administrations as well as practitioners such as coaches, athletes and parents. Our work will continue to

explore the best approach to quantifying the influence of these biases on the development of Canadian HP athletes.

Key stakeholders and benefits

These findings would be valuable for organizations such as Own the Podium and the Canadian Sport Centres/Institutes that are involved with the delivery of HP sport to Canadians as well as selecting and developing Canadian HP athletes.

In addition, organizations such as Sport Canada, Exercise is Medicine Canada, Public Health Canada, etc. may find the results interesting as they relate to broader social issues such as involvement in physical activity and exercise.