The double articulation of the Relative Age Effect on Swedish Football players

Tomas Peterson
Dept. of Sport Sciences, Malmö University, Sweden

Published on the Internet, www.idrottsforum.org/peterson141216,
(ISSN 1652–7224), 2014-12-16

Copyright © Tomas Peterson 2014. All rights reserved. Except for the quotation of short passages for the purposes of criticism and review, no part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the author.

The existence of Relative Age Effect is by now a widely recognized effect of selection systems within competitive children and youth sport across sports and countries all over the world (Grondin, Deschaies, Nault 1984; Barnsley, Thompson, Barnsley 1985; Helsen, Starkes, Van Winckel 1998; Musch, Hay 1999; Musch, Grondin 2001; Delorme, Raspaud 2009). RAEs refer "both to the immediate participation and long-term attainment constraints in sport, occurring as a result of chronological age and associated physical (e.g. height) differences as well as selection practices in annual age grouped cohorts" (Cobley et.al 2009, p 235). The main aim of this study is not to comfirm the existens of RAE in the selection systems of Swedish children and youth football. Yet such existence is confirmed. In a study including all children born 1984 registered with the Swedish Football Association, the Relative Age Effect was documented on all levels of the selection systems. Even the selection of players who had been rejected by the selection system, but still became elite players, was influenced by Relative Age Effects. In 2009, at the age of 25, there were 61 Swedish elite players born 1984 (46 men and 15 women). Twenty-seven of them did not belong to the group of players picked by the selection system. Out of the individuals identified as future elite players by the selection system, half of the men and three out of four women became "confirmed elite". The others were replaced by individuals who had been rejected by the selection system, because of Relative Age Effects, and left to creating a carrier for themselves outside the system. These empirical findings suggest that the Swedish football elite is not created by the selection system, but rather in spite of it.

TOMAS PETERSON is professor in Sport Sciences at Malmö University. His research interests include the professionalization of Swedish football during the post-war period, children's and youth sport as a socialization arena, the relation between school sports and voluntary sports, social entrepreneurship and sport, and sport politics.

Introduction

In a study including all children born 1984 and being members of Swedish Football Clubs, the relative age effects of the selection systems are discussed. There are two parallel national selection systems within the Swedish Football Association (SvFF), one for the girls and one for the boys. They are built in the form of pyramid-shaped ladders where the rung on each level is narrower than the one below. The first level consists of local test camps, separate camps for girls and boys, where all football clubs can send their supposedly most talented 13-years old players. At this age, approximately 25.000 children are members of football clubs in Sweden, The next level are district camps for players aged 13–14, selected from the local camps. The last level is the one week national Elite Girls and Elite Boys camps for each age cohort at the age of 15. Each of the 24 football district organizations sends 16 players to both elite camps. Out of the 384 players of each camp, 64 are chosen to play All Star Team games in the end of the week. Half of them are then called to a preparatory National Team camp, and 16 are chosen for the first Under 15 National Youth Team (for the girls born 1984, their first National Team was the Under 16 Youth Team. Today, however, Sweden also has a female Under 15 Youth Team).

Out of the 1984 cohort, 77 players (50 boys and 27 girls) played at least one national youth game in 1999–2004. This group represented the outcome of the selection systems; the players were regarded as the best in their cohort and the ones that would eventually become professional football players – playing abroad or in the highest domestic leagues. Nine out of ten were, at the age of 15, either under contract with an elite football team, or were to be presented with such a contract between 16 and 18 years of age.

In 2009, at the age of 25, information about all players born 1984, playing abroad, in the first division for men and for women, or in the second division for men, was analyzed. This group of 61 players (46 men and 15 women) was compared to the first group. The questions were:

- with what degree of accuracy did the national selection systems identify the "confirmed elite" at the age of 25?
- what was the role of the relative age effect in the process?

As we shall see, 27 out of 61 confirmed elite players did not belong to the Youth National Team Group.

Materials and methods

Three sources of data are used in this article. The first one comes from a longitudinal study, "The Decisive Years – A Longitudinal Study of Children, Youth and Sport. A study of football playing girls and boys born 1984", supported by The Social Science Research Council 1997–2001, Children's Welfare Foundation Sweden (Allmänna Barnhuset) and The Swedish Football Association. In all, 1117 individuals (64% boys, 36% girls) were selected from 46 teams in 31 football clubs in a sample based on sex, the clubs position in the Division

system, and their geographical and demographical placement. Empirical material was collected between 1997 and 2004. The players responded to an interview questionnaire at the ages of 13, 14 and 15. Moreover, parents and coaches received separate questionnaires, and descriptions of the clubs were added. For every individual, the month of birth was recorded. At the ages of 16 and 19, information was added regarding if the players still played in the same clubs. The group of players from "The Decisive Years" will be called "The project group". Out of the project group, 239 players were sent to local camps – thus "The local camp group".

In addition, a similar interview questionnaire was completed by 763 girls and boys participating in the Elite Girls camp and the Elite Boys camp in 1999. This group will be called "The Elite camp group". The 77 players who played at least one national youth game in 1999–2004 will be called "The Youth National Team group" (out of this group, all female and all male players except four attended the camps). Informed consent from the parents was provided from each individual, and The Swedish Data Inspection has approved on the handling of personal information in the database. In this article, only results related to the questions of "who became elite players" and "what was the role of relative age effect in the process" are reported.

The second empirical material is the official statistics of the Swedish Football Association, mostly regarding the cohort of 1984, during 1999–2009. These data are available at the SvFF homepage. The empirical material contains data about all 61 men and women born in 1984, who in 2009 belonged to the Swedish football elite, playing in Sweden or abroad. This group will be called "The confirmed Elite". This information was obtained mainly through club home pages after the season of 2009. The facts have been double checked by members of the Swedish Historians and Statisticians Club. Instances of Official Statistics of Sweden have been utilized.

Two methods are used to measure the relative age effect on the selection of individuals on different levels of the selection systems – Indices and Odds Ratios. Indices are used within social sciences to determine the quality of a given population using one single variable. Examples of this are Segregation Index and Inequality Index. The one used here is called a Discrimination Index, measuring the differences between the birthday distribution of all individuals in the 1984 cohort, and the birthdaydistribution of selected groups on different levels of the selection systems. There are two basic assumptions to justify this comparison. The first one is that there is no relation, in the moment of birth, between day of birth and potential talent (whatever is meant by "talent") to become an elite football player. The second is that there is no relation between day of birth and the decision to join a football club in the age of 5–7 in Sweden. Although there might exist some degree of self-selection among less physically matured children in this decision, no evidence of this has been reported. Given these two assumptions, if all potential talent in a cohort in the moment of birth was to be transformed into "confirmed Elite" in adult age, the distribution of days of birth for the "confirmed Elite" would correspond to that of the entire cohort.

The Discrimination Index measures, on a scale between 0 and 1, the deviation from the expected value, that is, the difference between the distribution of quartiles of the selected group and the cohort of 1984 in Sweden. The Discrimination-Index, thus, measures the

proportion of RAE in the selected group, where 1 = total RAE, 0 = No RAE. The formula for the Discrimination-Index is[1]:

$$I = \sum_{i}^{n} |(k_i/K) - (m_i/M)|$$

An alternative way of measuring the strenght of RAE:s is Odds Ratios, for example the odds for individuals born in the first quartile to be selected into the Elite camps, compared to those born in the forth quartile. The basic difference between a Discrimination Index and Odds Ratios in this paper is that Odds Ratios does not deal with individuals born in quartiles two and three. The Correlation Coefficien between the Discrimination Index and Odds Ratios for all selected groups in the study is 0.98.

Results

The existence of the RAE is confirmed in Table 1. Note that the first two selected groups belongs to a strategic sample (The Decicive Years) and the last two groups to a total sample (all players attending the Elite camps of 1999).

Table 1 *Discrimination Index and Odds Ratios for four selected groups out of the cohort of 1984 in Swedish children- and youth football.*

Selected groups	N	Discrimination Index	Odds Ratio
The project group, age 13	907	0,145514	1.50
The local camp group, age 13	239	0,39319	3.24
The Elite camp group, age 15	763	0,26334	2.80
The Youth National Team group, age 15-19	77	0,426088	3.82

In spite of the obvious effects of differences in physical maturity within a cohort on the selection of talent that can be interpreted from these findings, one could, however, still argue that the most talented actually were chosen. In this case you could argue that the 77 football players born 1984 that played at least one Youth National Team game 1999–2004 were the ones that later on would became the "confirmed elite". This is, however, an argument that is empirically testable. We now know who the "confirmed elite" of the 1984 cohort is. In 2009, at the age of 25, there were 61 players (46 men and 15 women), born 1984, playing abroad, in the national first division for men and for women, or in the second division for men. The use of these criteria is based on the likelihood of getting most of your income from football. The age of 25 is chosen because few players became elite players after that age, and most of them have not stopped playing professional football. So the age of 25

1 The notations to the formula is: K_i = Number of children born in the specific quartile, participating in the study; m_i = Number of children born in the specific quartile in Sweden 1984; K = Number of children born in the rest of the quartiles, participating in the study; M = Number of children born in the rest of the quartiles in Sweden 1984; n = Number of quartiles.

would be when a maximum number of individuals from a cohort are part of the football elite in Sweden.

When looking at these 61 individuals, two things can be noted. The first one relates to the "effectiveness" of the selections systems. Did the players belong to the "Youth National Team group" or not"? Twenty-seven out of 61 players did not belong to the "The Youth National Team group". The selection system did not manage to find more than half of the males (23–23) who would play professional football at the age of 25. For the women the system found 11 out of 15. As previously noted, the Discrimination Index for the "Youth National Team group" indicates that a large proportion of the cohort's "potential talent" at the moment of birth had been rejected because of relative age effects. A large part of the identified talent was never to become "Confirmed talent". Those players were replaced by players who were sorted out on different levels of the selection systems, all of them, except four boys, before the Elite Camps at the age of 15.

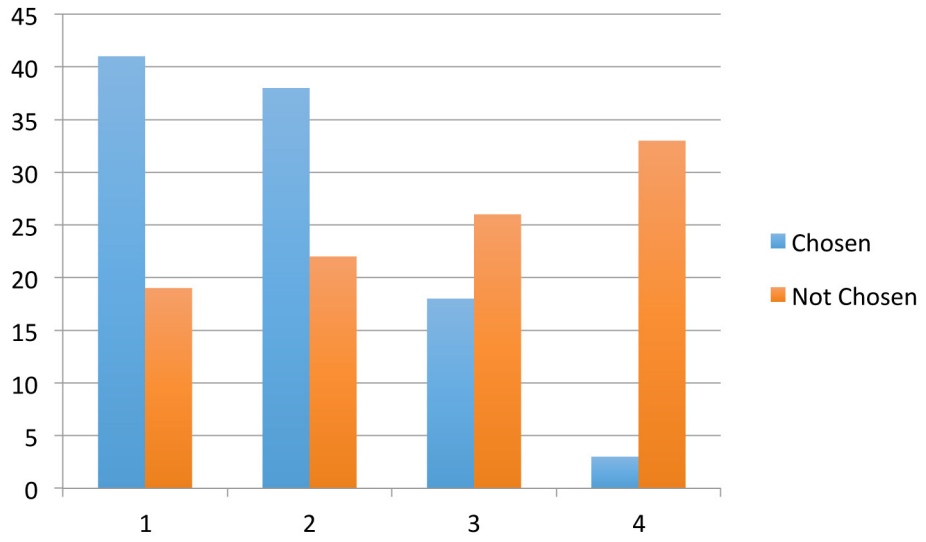

Figure 1 *The Confirmed Elite 2009: being chosen or not being chosen by the selection system, in quartiles. N = 61 (%)*

The second thing to be noted is shown in Figure 1, and relates to the question of why such a large part of the elite-to-be never was found by the selection systems. The group of players rejected by the systems was also formed by relative age effects – only inverted: the probability of belonging to this group increases the later in the year they were born (Chi 2 = 10.26 (1 d.f.); $p < 0.01$). This could be called the double articulation, and the double confirmation, of the relative age effect on Swedish football players.

Discussion

Out of each cohort, a number of individuals will in adult age belong to the Swedish football elite. The absolute number will differ from year to year, estimated to between 50 and 100 individuals. The 1984 cohort's contribution was 61 individuals. Given the two assumptions earlier mentioned, if all potential talent in a cohort in the moment of birth was

to be transformed into "confirmed Elite" in adult age, the distribution of days of birth for the "confirmed Elite" would correspond to that of the entire cohort. The results presented in Table 1 indicate that the selection system of Swedish children and youth football for the cohort of 1984 was heavily influenced by relative age effect. In 42.6% of the cases the positions were filled with individuals that should not have been there, as a result of "chronological age and associated physical (e.g. height) differences as well as selection practices in annual age grouped cohorts" (Cobley et al 2009, p 235). The Odds Ratio, in this paper only dealing with the first and last quartiles, for the same group was 3.82.

Out of the individuals identified as future elite players by the selection system, half of the men and one fourth of the woman were not to belong to the "confirmed Elite". They were replaced by individuals who were rejected by the selection system, because of relative age effects, referred to creating a carreer for themselves outside the system. These empirical findings suggest that the Swedish football elite is not created by the selection system, it is rather created in spite of it.

Perspective

A number of recommendations have been proposed to resolve RAEs. You can change the cutoff dates (Grondin, Deschaies, Nault 1984), change the length of the bandwidth (Boucher, Halliwell 1991; Hurley et.al 2001), use different cutoff dates for different games or sports (Ryan 1989, Musch, Grondin 2001), or use grouping participants according to physical classification, or quotas (Barnsley et.al 1992). You can also delay the processes of selection beyond stages of puberty and maturation. All these solutions demand large resources – in terms of organization and economy – to be implemented. But more importantly, none of them will prevent RAE from affecting the selection systems. Few researchers question the basic logic of selections systems. In order to develop talent, to find the elite, selection systems are needed. But no one has, as of today, in theory or in practice, argued that selection systems can be used without the appearance of Relative Age Effects. And physical maturity has nothing to do with talent for becoming an elite athlete. Therefore my conclusion is that all selection systems used in children and youth sport should be abolished.

References

Barnsley RH, Thompson AH, Barnsley PE (1985) Hockey success and birthdate: the RAE. *Can Assoc Health Phys Educ Recreation J; 1: 23-8*

Barnsley RH, Thompson AH, Legault, P (1992) Family planning: fottball style – the relative age effect in football. *Int. Rev. for the Sociology of sport, 27.*

Boucher J, Mutimer B (1994) The relative age phenomenon in sport: a replication and extensions with ice-hockey players. *Res Q Exerc Sport; 65: 377-81*

Cobley, S, Baker, J,Wattie, N, McKenna, J. (2009) Annual Age-Grouping and Athlete Development. A Meta-Analytical Review of Relative Age Effects in Sport. *Sports Med; 39 (3): 235-256*

Grondin S, Deschaies P, Nault LP. (1984) Trimesters of birth and school output [in French]. *Apprent Social; 16: 169-74*

Helsen, W, Starkes, J, Van Winckel, J (1998), The influence of relative age on success and dropout in male soccer players. *American Journal of Human Biology, 10: 791–798*

Hurley W, Lior D, Tracze S. (2001) A proposal to reduce the age discrimination in Canadian minor hockey. *Can Public Policy; 27 (1): 65-75*

Musch, J., & Hay, R. (1999). The relative age effecting soccer: Cross-cultural evidence for a systematic discrimination against children born late in the competition year. *Sociology of Sport Journal, 16, 54-64*.

Mush, J Grondin S. (2001) Unequal competition as an impediment o personal development: a review of the relative age effect in sport. *Dev Rev; 21: 147-67*

Ryan, P. (1989) *The Relative Age Effect on minor sport participation*. Unpublished master's thesis. Montreal, Quebec: McGill University