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Early development in youth swimming? A categorisation of maturity status and relative age effects

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INTRODUCTION:

In talent identification, recent investigations provide data contributing to research on the relative age effects (RAE) and its relation to biological maturity (Deprez et al., 2013; Müller et al., 2016). These studies have shown no significant differences in maturity-related characteristics (i.e., age of peak height velocity; APHV) between the four age quartiles (Q), regardless of gender. Therefore, relatively younger swimmers may be able to counteract their relative age disadvantage if they have the same biological maturity status as their somewhat older counterparts. Thus, an in-depth analysis was conducted to categorise the swimmers into early, normative, and late-developed athletes. Whether the sample tends to include early developers because the parameter APHV cannot provide insight into the biological maturity categorisation remains to be elucidated.

METHODS:

650 German state-level swimmers (age 11.00 ± 1.27 years; female $n=377$, APHV: 11.56 ± 0.46 ; male $n=273$, APHV: 13.31 ± 0.61) were categorised into three groups of biological maturity (late, normative vs early) based on APHV's mean (M) \pm standard deviation (SD), regarding gender (normative: APHV = M \pm SD; early: APHV < M - SD; late: APHV > M + SD). To analyse the difference between the expected standard normal distribution and the observed relative frequency distribution [%] of early, normative, and late-developed athletes for the male and female sample, Chi-square tests were computed ($p < .05$).

RESULTS:

Female athletes were normative developers if they had an APHV between 11.10 and 12.02 years (male: APHV = 12.70-13.92), early developers if their APHV was less than 11.10 years (male: APHV < 12.70), and late developers with an APHV higher than 12.02 years (male: APHV > 13.92). Most athletes (70.31%) were normative developers, 14.92% were early developers, and 14.77% were late developers. The percentage distributions of the developmental categorisation did not differ significantly from the expected standard normal distribution in both gender (male: $p = .753$, female: $p = .193$).

CONCLUSION:

The findings indicate that the sample of German youth swimmers only includes a small proportion of early developers on average. At the same time, there are conspicuously few late developers born in Q4. Therefore, it can be assumed that relatively younger swimmers can counteract their disadvantage only with an early or normative biological maturity status, which significantly impacts swimmers talent identification and development.

Deprez, D., Coutts, A. J., Fransen, J., Deconinck, F., Lenoir, M., Vaeyens, R., & Philippaerts, R. (2013). <https://doi.org/10.1055/s-0032-1333262>

Müller, L., Müller, E., Hildebrandt, C., & Raschner, C. (2016). <https://doi.org/10.1371/journal.pone.0160969>

Topic: Training and Testing

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