

Longitudinal performance of youth soccer players: 10m sprint percentile curves adapted to biological age

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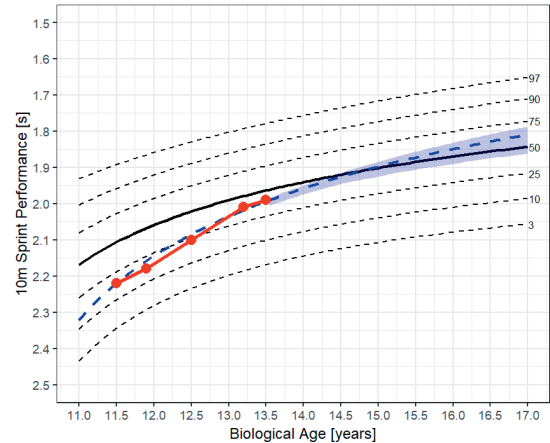
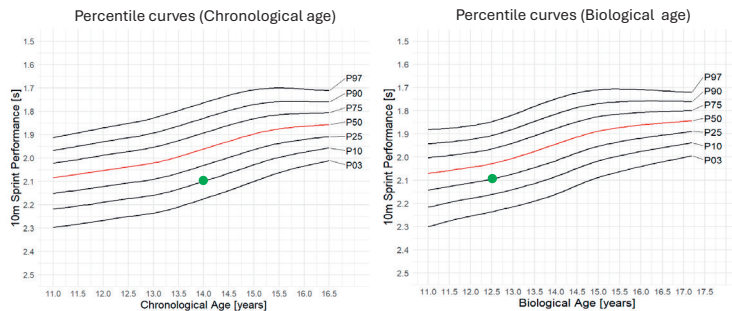
WHY DOES THIS MATTER?

Traditional percentile curves are usually based on chronological age (CA) ¹. However, players of the same CA can differ substantially in biological maturity and are not necessarily at the same stage of development ². More mature players may therefore appear physically superior partly because they are further along in their development ³. This can influence how players are evaluated, potentially over- or underestimating their performance.

WHAT DID WE DO?

Percentile curves
(M = 9085, F = 391 observations, from 2017 - 2024)
10m sprint performance was compared using
CA vs. BA ⁴

Longitudinal modelling
(M = 1101, F = 46 players ; ≥ 3 rep. Measures)
Linear mixed models were used to account for:
- repeated measurements
- individual baseline sprint performance
- individual rates of development
- future performance predictions



WHAT DID WE FIND?

RESULT 1

When sprint performance was evaluated relative to BA instead of CA, percentile rankings changed significantly ($p < .001$).

Late maturers: +13.5 percentile ranks
Early maturers: -20.8 percentile ranks

RESULT 2

BA better explained sprint performance than CA.
→ $R^2 = .22$ vs. $.18$, $p < .001$

RESULT 3

Players develop at different rates
→ Lower initial performance was linked to greater improvement over time: $r = -.79$

The same pattern was observed for female players, but changes were smaller and mostly not significant

SO WHAT?

1. CONSIDER MATURITY WHEN INTERPRETING SPRINT PERFORMANCE

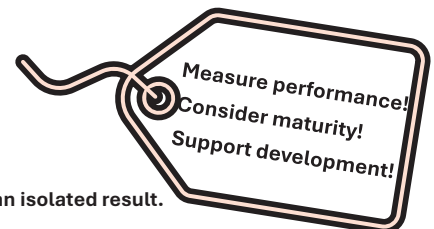
Late maturers may be underestimated; early maturers may have a maturity-related advantage.
→ **Current performance ≠ future potential.**

2. LOOK BEYOND TODAY'S PERFORMANCE

Individual players show different starting levels and different rates of improvement.
→ **Repeated measurements and the player's longitudinal trend provide more information than an isolated result.**

3. TRACK DEVELOPMENT, SUPPORT, DON'T SELECT

Sprint performance is only one component of player development and is also influenced by factors beyond biological maturation.
→ **Use testing to track progress, identify areas for improvement, and support long-term development . Do not use a standalone selection tool.**



References

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