

Swimming Proficiency – An Alternative Performance Metric For Competitive Swimmers

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Abstract:

Background. As a performance indicator, swimming times measure speed but do not measure swimming proficiency. Consider this, two swimmers swim the same time, one swimmer is 5 feet tall and the other is 6 feet tall. If we use times as a proficiency indicator we conclude the two swimmers equal, however, clearly the smaller swimmer here would be the more proficient. Fortunately there is a simple ratio that can define swimming proficiency, namely, the speed you swim your own body length.

$$\text{Swimming Proficiency (SP)} = \text{Time (seconds)} / \text{Number of Body Length's in the event}$$

What has become crystal clear is that any performance metric based on times alone will fail as a proficiency metric. Height is such a significant factor in unearned swimming speed, that it must be considered in any measure of proficiency. Dividing time by the number of BL's essentially normalizes height as a performance factor. Consider the difference in body lengths in a 100 yard event for a 5 foot and 6 foot swimmer. The 5 foot swimmer swims 60 BL's, while the 6 foot swimmer swims only 50 BL's. That is a 10 BL difference. Although this is an extreme example, height differences less than 1 inch can easily add up to 4 to 5 feet in the effective race distance.

In order for the SP equation to be valid, it must not favor tall or short swimmers. Validation of the SP equation is reported here.

Research Methods. NCAA Div I times and team bios with height data were used to assess the relationships between times & height, and SP & height. USA Swimming databases were used for SP trending and correlation. Historical 40 year times/heights, motivational time standards, and Hy-Tek Power Point time lines were paired with US National height and age data. International height and time data was used along with US height and time data in the construction of SP Standards.

Results/Findings.

- For NCAA Div I: 65% come from the tallest 25%. 3% come from the shortest 25%.
- For NCAA Div I: The fastest 1% come from the tallest 5% (>74.25" men, >68.55" for women).
- For NCAA Div I: Taller swimming groups are faster on average than smaller swimming groups.
- For NCAA Div I: SP parity exists across all height groups.
- The average height of motivational performance groups gets taller as the performance group gets faster.
- SP improves for all motivational performance groups as swimmers age-up.
- SP parity exists for each age group regardless of the performance group.
- SP highly correlates with the Hy-Tek Point System time lines. SP parity exists across all height groups.

Conclusions. The SP equation is a scientifically valid performance indicator for competitive swimmers. SP does not favor tall or short swimmers. SP Standards are based on world-wide height and time data.