

The Validity of Swimming Distance and Swimming Speed as Predictors of Swimming Competence

Laakso BW^{1,2}, Stallman RK^{2,3,4}

¹Lillehammer Community School District, ²Norwegian Life Saving Society,
³Norwegian School of Sport Science, ⁴Tanzanian Life Saving Society

Presented at
The World Conference on Drowning Prevention
Da Nang, Vietnam; 10 – 13 May, 2011

Introduction

- Distance is probably the most common criterion for defining 'can swim'
- Usually designated between 25–200m
- 'How far' is usually considered more important than 'how'
- All-around development is underestimated
- Ability to swim 1000m continuously would probably be considered 'proof', by most, of 'can swim'

Introduction

- If distance is a common criterion for judging swimming competence, speed is another.
- Speed is sometimes a criterion for school marks.
- In competitive swimming a better time is a better swimmer. But is faster safer?
- Speed does not always guarantee economic movement.
- Speed may be a valuable asset in some settings but is no substitute for all around development.

Introduction cont.

- Idea of all-around development not new
- 'Fancy' & 'scientific swimming'
- 'Watermanship'- 'aquatic competence'
- Only in last 20-25yrs has it been attempted to conceptualize & quantify this concept
- A model exists to measure competence
- The model is 'operationalized' in a 200m combined test

A Definition of Can Swim

- Enter deep water easily and safely
- Surface and level off
- Surface dive and swim under water
- At least two strokes, 1 on front, 1 on back
- Economic & integrated breathing
- Turn L & R, on front and on back
- Roll over, front to back & vice versa
- Stop and rest with minimal movement
- Exit easily and safely
- All of the above, clothed and in open water

The Definition *Operationalized*

- 'Roll into deep water, surface and level off; swim 100m on the front; stop and rest for 3 min (ca ½ on front & ½ on back); swim 100m on the back; exit the water safely.
- This operationalization is considered to have construct validity and is used as the criterion test for both studies.

Aims

The aims of these studies were:

- a) to determine the extent to which distance achieved can predict performance on a 200m combined test.
- b) to determine the extent to which time achieved on a 200m time trial can predict performance on a 200m combined test.

Methods – Study A

- Grade 4 children (n=339) performed 2 tests within 10 days.
- Randomly, half swam the 1000m test first and the others the criterion test first.
- On the 1000m test, distance achieved was recorded or they stopped at 1000.
- On the 200m combined test, success or failure was recorded on each element as well as the final score.
- The distance swum was correlated with final score on the combined test
- For those who completed 1000m, a frequency distribution was compiled for each element & final score

Results – Study A

- 74% completed 1000m continuously
- Of these, on the 200m combined test; 7% failed the entry; all swam 100m on the front; 29% failed to rest 3min; 19% failed to swim on the back; 36% failed to score maximum points (can swim).
- The correlation between distance achieved and final score on the combined test was $r = 0.57$

Discussion – Study A

- The correlation between distance swum and performance on the combined test ($r=0.57$) does not suggest good predictability
- The differences in performance suggest that the 2 tests measure different qualities
- Given the construct validity of the criterion 200m combined test, the 1000m distance test is considered a non-valid predictor of swimming competence.

Conclusions – Study A

- Distance alone is not a good predictor of swimming competence
- The more all-around development shown in mastering the more comprehensive 200m combined test is a survival skill set in itself and gives a good foundation for adding other specific survival skills

Methods – Study B

- The 200m combined test described above was used as the criterion test (construct validity).
- Grade 6 pupils (n=289) swam 2 tests within 10 days.
- The second test, a 100m time trial, represented speed.
- Randomly, half swam the time trial first and half the combined test first.
- The time was correlated with the final score on the combined test.

Results – Study B

- The correlation between the two tests was $r = 0.63$.
- The mean time for all subjects was 3:04 (\pm SD 21.1)
- On the 200m combined test, the weakest elements were a) stop & rest 3min (35% failed) and swim on the back (23% failed) and only 63% scored maximum points.

Discussion – Study B

- Most youth of this age are at the threshold of puberty. The 2 most likely contributors to speed are strength and technique. The developmentally advanced may swim faster simply because of strength yet not possess economic movement nor possess a broader repertoire of skills. An aquatic accident may take many forms. Many possible solutions are needed.

Discussion – Study B

- Speed may be a valuable asset in some settings but is no replacement for all-around aquatic skill competence.
- If an emergency requires additional skills such as floating, treading water, swimming under water, swimming on the side or back, swimming with one or more limbs incapacitated – speed alone is not enough.

Conclusion – Study B

- In a water safety education setting, within the school setting or outside, evaluation of progress in a survival context, based on speed alone is not sufficient.
- Speed is a poor predictor of all-around aquatic competence.

Thanks for your attention!



"Come on in - the waters great!"

Any Questions?



