CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
Patrick K. McCabe

Project Number
S1008

Project Title
Does Function Follow Form in Club Swimmers?

Abstract

Objectives/Goals
The purpose of this investigation was to determine if anthropometric measurements of competitive, teenage club swimmers predicted their best performance in the four basic strokes - that is, does function follow physical form.

Methods/Materials
Informed consent was obtained from 25 members of four nationally ranked club swim teams. Anthropometer, anthropometric tape, skinfold caliper, strain gauge digital scale, and measuring tape were used for 24 measurements and calculations per swimmer (termed the restrictive anthropometric profile). The swimmers' best events were determined by comparing their times with the time standards in the Pacific Swim Guide (USA Swimming). Student t-test was used to analyze the results.

Results
Of 120 comparisons, only seven were statistically significant ($p < 0.05$). Breaststrokers had smaller supraspinale and abdominal skinfold measures, backstrokers had larger gluteal skinfolds, and butterflyers were heavier and had greater flexed arm and relaxed arm girths, and greater iliac crest skinfolds.

Conclusions/Discussion
Only seven measurements differed significantly by a standard statistical criterion. Six measurements would be expected to differ by chance alone, using $p = 0.05$ as the arbitrary cut point, and so little confidence can be placed in the predictive value of these measures. Another study of a similar group of swimmers is needed to validate these even measures. The most conservative interpretation is that the restricted anthropometric profile of a relatively homogeneous group of very competitive swimmers is not predictive of performance, and that other factors, such as motivation or efficient muscle function, are likely determinative.

Summary Statement
Using the restricted anthropometric profile, I tried to determine if certain physical characteristics of teenage club swimmers could predict their best strokes.

Help Received
Dave Cademartori, Senior Account Manager at Pacific Bell and a former United States Olympic swimmer, helped me use statistical functions on Microsoft Excel.