

Analysis shows now-banned technical swimsuits led to top swim performances in 2009

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(PhysOrg.com) -- Superstar swimmers and certain comic book superheroes have something unusual in common--when they wear special suits, they gain phenomenal abilities. A first-of-its-kind study from Northwestern Medicine highlights how now-banned technical swimsuits artificially enhanced athlete performance in 2009.

“Our data strongly indicate that it was more than just hard work that allowed athletes to set the unprecedented 43 world records during the 2009 world championships,” said Lanty O’Connor, first author of the study, published in the December 2011 issue of the [Journal of Strength and Conditioning Research](#). “The swimsuits played a significant role.”

Since the Fédération Internationale de Natation (FINA) banned the full-body, polyurethane technical swimsuits from the sport in 2010, only two world records have been set, added O’Connor, who is also the manager of simulation technologies in the department of simulation technology and immersive learning at Northwestern University Feinberg School of Medicine.

The suits were suspected of reducing drag, improving buoyancy, compressing the muscles and other artificial enhancing properties, O’Connor said.

To determine the impact the swimsuits had on the dramatic performance

improvements in 2009, this study analyzed publicly available race data from 1990 to 2010 and compared improvements in swimming to improvements in track and field, a similar sport.

Other considerations analyzed were improvements in training science, changes in rules and regulations, gender differences, anaerobic versus aerobic events, unique talent and membership data.

Having excluded these possibilities, O'Connor said he was only left to consider the technical swimsuits as the primary reason for the improved performances in 2009 and that the regulation of technical swimsuits is significantly linked to the overall slower swim times since the beginning of 2010.

“It would be unfair to discredit the dedication and training of these athletes and their coaches, because this certainly played a role in improved performance over the past several decades,” O'Connor said. “But many, including FINA, had a strong suspicion that these suits were artificially enhancing performance. Now, nearly two years later, we have the data to show a strong correlation between the use of these suits and improved race times.”

Although much focus in professional sports is given to doping, it is important to be aware of other sources of artificial enhancement, according to John Vozenilek, M.D., senior author of the study and assistant professor of emergency medicine and medical education at Feinberg.

“Our interest in how elite athletes train arises from our interest in human factors and human performance under stress,” said Vozenilek, also director of simulation technology and immersive learning at Feinberg. “This piece of technical equipment appears to have created a distinct advantage for those [swimmers](#) using it. The implications of this for the

athletic community are far-reaching. Human-to-machine interfaces in athletics and in other domains continue to blur distinctions between improvements in training and external enhancements.”

Incredible swim performances are possible without the assistance of high-tech suits, O'Connor said, pointing to two swimmers in 2011 that each broke a record set in 2009. But those two records don't make a dent in the phenomenal number of records made in 2009, O'Connor added.

Provided by Northwestern University

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