

Teenage great white sharks are awkward biters

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The jaws of adolescent great white sharks may be too weak to capture and kill large marine mammals, according to a new study published in the *Journal of Biomechanics* by an international team of scientists.

The researchers also found that, unlike mammals, sharks can maintain high bite forces no matter how widely their jaws are open, thanks to a unique jaw muscle arrangement that has helped them to be among the most successful predators of all time.

The study is the first of its kind to use sophisticated three-dimensional computer models and advanced engineering techniques to examine how different sharks hunt and kill [prey](#).

Detailed [computer simulations](#) examined the feeding behaviour of two threatened shark species: the harmless grey nurse – or sand tiger - and the notorious great white.

Digital models revealed that the jaws of grey nurse sharks are spring-loaded for a rapid strike on small, fast-moving fish, while those of great whites are better suited for a powerful bite on prey ranging in size from small fish to large marine mammals.

"We were surprised that although the teeth and jaws of our sub-adult great white shark looked the part and the muscles were there to drive them, the jaws themselves just couldn't handle the stress associated with big bites on big prey," says study co-author Dr Stephen Wroe, who heads

the Computational Biomechanics Research Group in the UNSW School of Biological, Earth and Environmental Sciences.

The reason for this appears to be that until great whites reach a length of about 3 metres or more their jaws haven't developed enough stiff mineralised cartilage to resist the forces involved.

The 2.5 metre [great white shark](#) used for the study was caught by the NSW Bather Protection Program. "It is hard to believe, but at this size great whites are basically just awkward teenagers that can't hunt large prey very effectively," says UNSW doctoral student Toni Ferrara, the lead author of the article. "It seems paradoxical that the iconic jaws of great white sharks - made infamous by the classic Steven Spielberg movie Jaws - are actually rather vulnerable when these sharks are young. Great white sharks are not born super-predators, they take years to become formidable hunters."

Co-author Dr Vic Peddemors, of the NSW Cronulla Fisheries Research Centre of Excellence, says: "This study may also explain why many of the shark attacks off NSW are aborted after a single exploratory bite, as the great whites involved are usually juveniles that might sustain jaw injury if they persevered with the attack."

Provided by University of New South Wales

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