

Research verifies a Neandertal's right-handedness, hinting at language capacity

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Scratch marks on the teeth from the Neandertal skeleton Regourdou.

(Phys.org)—There are precious few Neandertal skeletons available to science. One of the more complete was discovered in 1957 in France, roughly 900 yards away from the famous Lascaux Cave. That skeleton was dubbed "Regourdou." Then, about two decades ago, researchers examined Regourdou's arm bones and theorized that he had been right-handed.

"This skeleton had a mandible and parts of the skeleton below the neck," said David Frayer, professor of anthropology at the University of Kansas. "Twenty-plus years ago, some people studied the skeleton and argued that it was a right-handed individual based on the [muscularity](#) of the right arm versus the left arm."

Handedness, a uniquely [human trait](#), signals brain lateralization, where each of the brain's two hemispheres is specialized. The left brain controls the right side of the body and in a human plays a primary role for language. So, if Neandertals were primarily right-handed, like

modern humans, that fact could suggest a capacity for language.

Now, a new investigation by Frayer and an international team led by Virginie Volpato of the Senckenberg Institute in Frankfurt, Germany, has confirmed Regourdou's right-handedness by looking more closely at the robustness of the arms and shoulders, and comparing it with scratches on his [teeth](#). Their findings are published today in the journal [PLOS ONE](#).

"We've been studying scratch marks on Neandertal teeth, but in all cases they were isolated teeth, or teeth in mandibles not directly associated with skeletal material," said Frayer. "This is the first time we can check the pattern that's seen in the teeth with the pattern that's seen in the arms. We did more sophisticated analysis of the arms—the collarbone, the humerus, the radius and the ulna—because we have them on both sides. And we looked at cortical thickness and other biomechanical measurements. All of them confirmed that everything was more robust on the right side than the left."

Frayer said Neandertals used their mouths like a "third hand" and that produced more wear and tear on the front teeth than their back ones. "It's long been known the Neandertals had been heavily processing things with their incisors and canines," he said.

Frayer's research on Regourdou's teeth confirmed the individual's right-handedness.

"We looked at the cut marks on the lower incisors and canines," said the KU researcher. "The marks that are on the lip side of the incisor teeth are oblique, or angled in such a way that it indicates they were gripping with the left hand and cutting with the right, and every now and then they'd hit the teeth and leave these scratch marks that were there for the life of the individual."

Fruyer said that the research on Regourdou shows that 89 percent of European Neandertal fossils (16 of 18) showed clear preference for their right hands. This is very similar to the prevalence of right-handers in modern human populations—about 90 percent of people alive today favor their right hands.

Fruyer and his co-authors conclude that such ratios suggest a Neandertal capacity for language.

"The long-known connection between brain asymmetry, handedness and language in living populations serves as a proxy for estimating brain lateralization in the fossil record and the likelihood of language capacity in fossils," they write.

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