Woer woers

How our African ancestors made sound in the Stone Age

By Sarah Wurz, Joshua Kumbani, Justin Bradfield and Neil Rusch

The Middle and Later Stone Age, which lasted from about 300 000 to 300 years ago in South Africa, was an important time for the African continent. During this period humans developed many different strategies to produce a variety of stone tools. They used fire as an engineering tool and to cook. As expert hunter-gatherers, they successfully inhabited many parts of Africa.

But one thing that's been missing from our understanding of this epoch is sound, noise or music. There's been very little research on the role of sound production during the Stone Age. That's very surprising since we know that the latter part of this period was an important one for the development of complex cognition, symbolic expression and social dynamics among human ancestors. So it stands to reason that groups which were communicating in complex ways might also explore sound for expression.

One reason to account for this lack of research may be that sound-producing instruments are usually made of organic materials which typically don't survive well, archaeologically.

We wanted to address this gap in the research. So we've established a working group to map and investigate Stone Age musical activities within Africa, incorporating ethnographic perspectives, knowledge gained from the in-depth study of various cultural groups.

One of our first projects has been to examine ancient versions of the strange disc-shaped object that South Africans colloquially know as a 'woer woer'. The woer woer ('whirr whirr' in Afrikaans) can be wound up between two pieces of string and released to produce the same kind of sound as a howling wind or a swarm of bees. Different versions exist in various parts of the world, known by different names.

Working with bone artefacts from archaeological sites in South Africa's southern Cape region, we've been able to show that some implements might have been used for sound production in the past.

This sort of research is important because it can shed light on human behaviour and the use of space. Some spaces may have been specifically selected for how well sound resonates and amplifies, perhaps to form part of rituals to induce altered states of consciousness or enhanced states of association.

Ukhence owenziwe ngethambo owatholakala emigedeni engasogwini oluseseningizimu neKapa, kungenzeka wawusetshenziselwa ukwenza umculo nemisindo esetshenziswa ukudunga inqondo kwiminyaka e 5000 eyendlule.

Translation by Zamantimande Kunene

A drawing of a broken bone artefact found at the Klasies River archaeological site in the 1960s was used as a reference for the replica woer woer on the left, while the replica on the right emulates a wooden 'spinning disk' collected from Bushmen in Namibia in the 1930s and archived in the Kirby Collection of Musical Instruments at the South African College of Music.

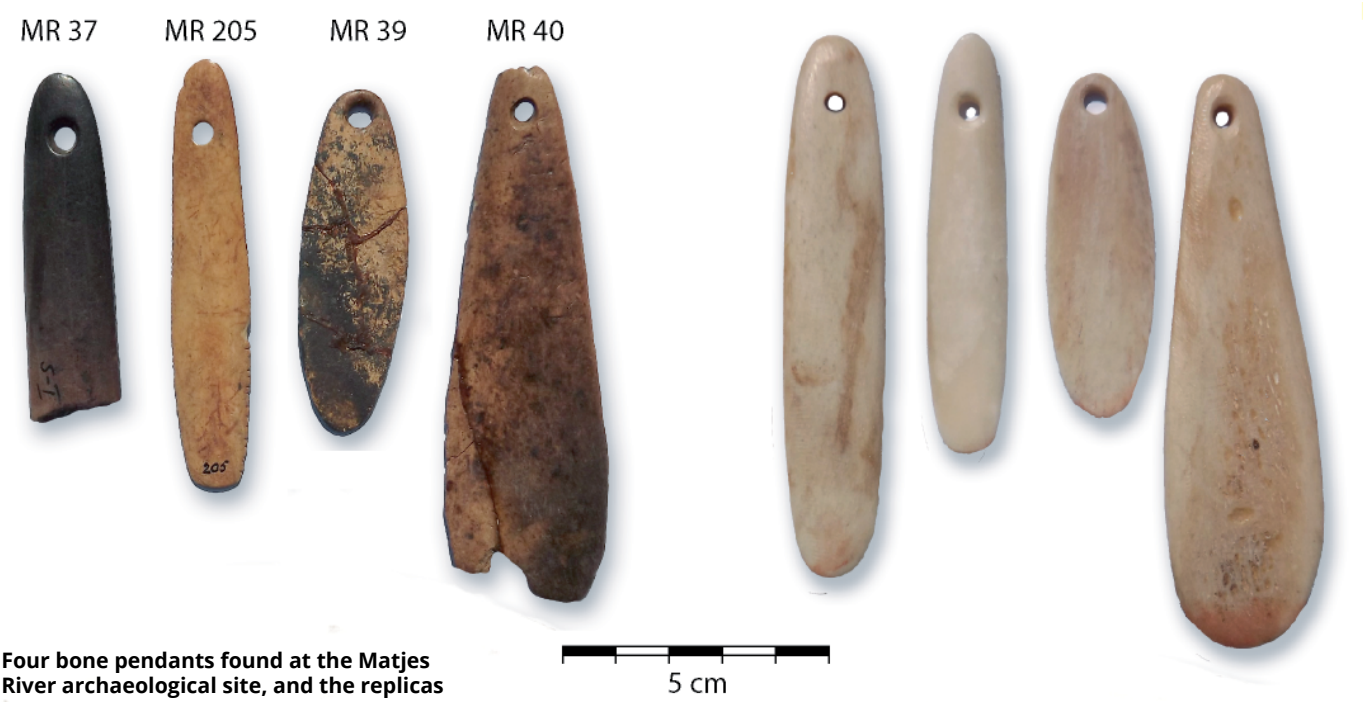
Bullroarers and woer woers

The woer woer works on the same principle as another instrument, the bullroarer. This has been used for centuries in many societies to produce sound, chiefly during ceremonial occasions. When it's spun through the air it produces audible vibrations that travel for some distance.

At least two examples of woer woers made from perforated pieces of bone have been recovered from archaeological sites along the southern Cape coast, at Klasies River and Matjes River. Both date back between 5 000 and 10 000 years.

The Matjes River woer woer was recovered together with perforated bone pendants. Some of these 'pendants' bear a striking resemblance to bullroarers from other parts of the world. Bullroarers are used by the Bushmen and Aboriginal people and are also found in Late Palaeolithic sites in Denmark, Germany and Norway.

But how could we be sure what the southern Cape artefacts were or what they were used for? Simple: we headed to a recording studio.



Four bone pendants found at the Matjes River archaeological site, and the replicas made by the research team.

Using the actual bone artefacts wasn't possible – they are protected by heritage legislation – so we made modern bone replicas and spun them mechanically for a total of 15 hours. The resulting sounds were recorded in the Field Sound Studio, Cape Town. We also recorded where evidence of wear from use occurred.

The sound frequency of the objects we assumed were woer woers ranged from 52 to 200 Hz. These are bass sounds, resembling those in nature, such as bees humming.

The frequency range across the sample of pendant replicas varied from 55.5 to 250 Hz, which is comparable to that produced by bullroarers. The replicas produced a sustained pulsing sound that may be likened to the breaking of ocean waves, thunder or breathing. If played in a cave, such as the sites where the original artefacts were found, the aural affect would have been impressively magnified.

Armed with these data, we conducted a few more experiments. Our interpretation of these results is that one of the decorative pendants was used to produce sound, in the same manner as a bullroarer.

If this interpretation is correct it means that aerophones were used in the distant past in southern Africa. Aerophones produce sound by creating vibrations in the air when they are spun around their axes. They are known as some of the earliest musical instruments in the archaeological record.

Buzzing as ritual gateway

So, why were these ancient bullroarers used? It's possible that sound may be associated with burying the dead. The artefacts we tested from both sites were associated with human remains.

Matjes River has yielded the remains of 120 individuals. The site was certainly a sacred one within the landscape: it was a burial ground for thousands of years.

There are other possible uses, based on ethnographic knowledge from southern Africa. The Ju|'-hoansi San of Namibia associate the sound of the bullroarer, which they use in male initiation ceremonies, with mythical creators. /Xam Bushmen in the 19th century reported how they would use the bullroarer to manipulate bees.

Interestingly, people entering an altered state of consciousness report hearing a buzzing sound as part of their hallucinatory experience. Bees are also depicted in

The soundtrack recorded during spinning of the largest pendant replica reveals the rhythmic, pulsing nature of the sound. The section highlighted in orange in the top wave output is shown in more detail beneath.

Renée Rust

The Klasies River archaeological site comprises a series of caves near the Klasies River mouth on the Cape south coast.

San rock art. These are believed to be associated with the altered state of consciousness shamans induced to enter the spirit world. When a woer woer or bullroarer is spun quickly a stroboscopic effect is produced, which may add to the hallucinatory experience.

This work not only aids our understanding of our ancestors' behaviour. It also suggests that it may be worth re-examining other bone artefacts whose true function may not yet be known.

- Listen to recordings of the replica woer woer and bullroarer at https://theconversation.com/how-our-african-ancestors-made-sound-in-the-stone-age-121142

- Kumbani et al. 2019. A functional investigation of southern Cape Later Stone Age artefacts resembling aerophones. *Journal of Archaeological Science: Reports* Vol. 24: 693-711. https://doi.org/10.1016/j.jasrep.2019.02.021

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