

Humpback Whale Song of the South Pacific

A deep dive into the social behaviour of humpback whale song

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Background

Like humans, animals also have **culture**. A key example is the **social sharing of song** between male **humpback whales** (*Megaptera novaeangliae*).

Song acts as a sexual display, with all males within a subpopulation singing the same song each season¹. Within the South Pacific, song follows an eastward pattern of transmission between subpopulations, eventually reaching the mysterious Cook Islands and French Polynesian subpopulations².

As the **song moves across the ocean** slowly, the whales will **add individual flair** to the song, which sometimes sticks; this is **song evolution**. Occasionally, the whales will replace the current song with a simpler, brand new song - this is a **song revolution**.³

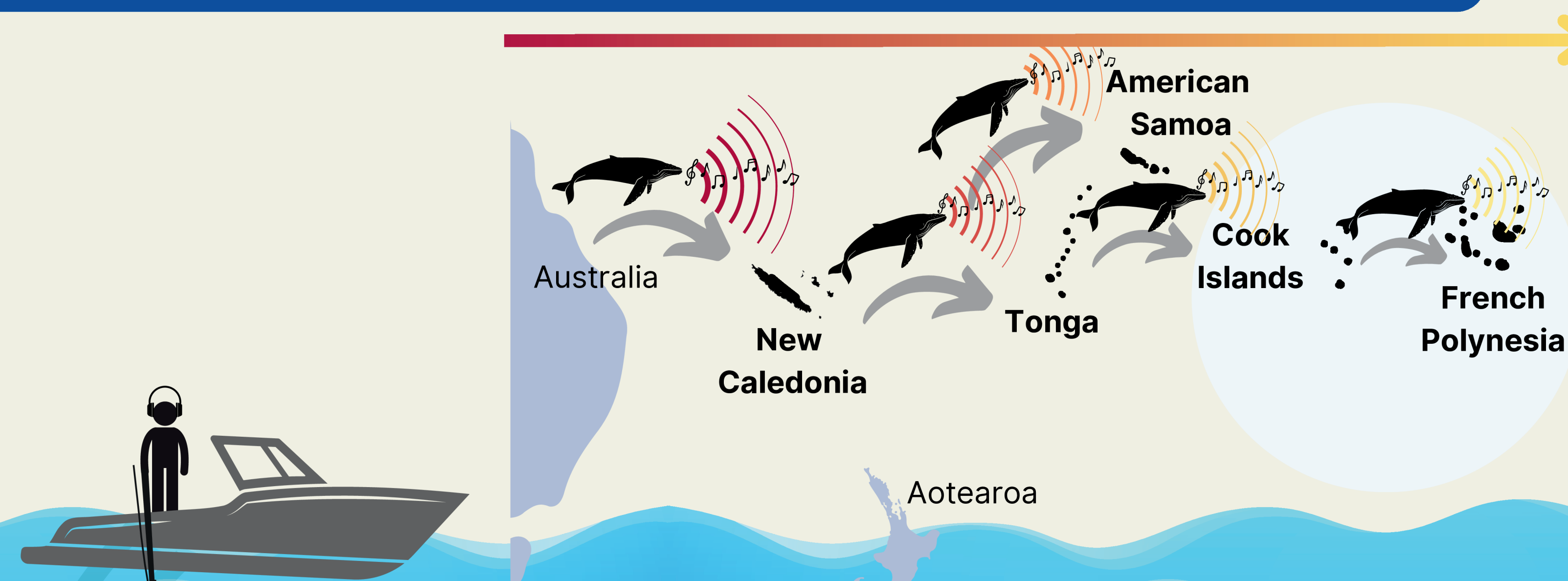
Research Purpose

- **Quantify** the **song evolution** from 2009-present in the elusive and poorly studied Central South Pacific - the Cook Islands and French Polynesia.
- **Compare** the song here with song from other areas, to see who is **interacting** with who.
- Does song continue moving eastward or does the **pattern** break (e.g. revolutions)?

Methods

- Analyse 25 hours of acoustic recordings as **spectrograms**.
- **Transcribe** individual sounds; each individual sound (= unit) is transcribed using a previously formed library of over 100 different types.⁴ Examples include purr, trill, groan, and squeak.
- Then, identify the patterning of **units**, **phrases**, and **themes** - the hierarchical structure of the overall song.

Song transmission pattern. Song evolution over time represented by colour change.

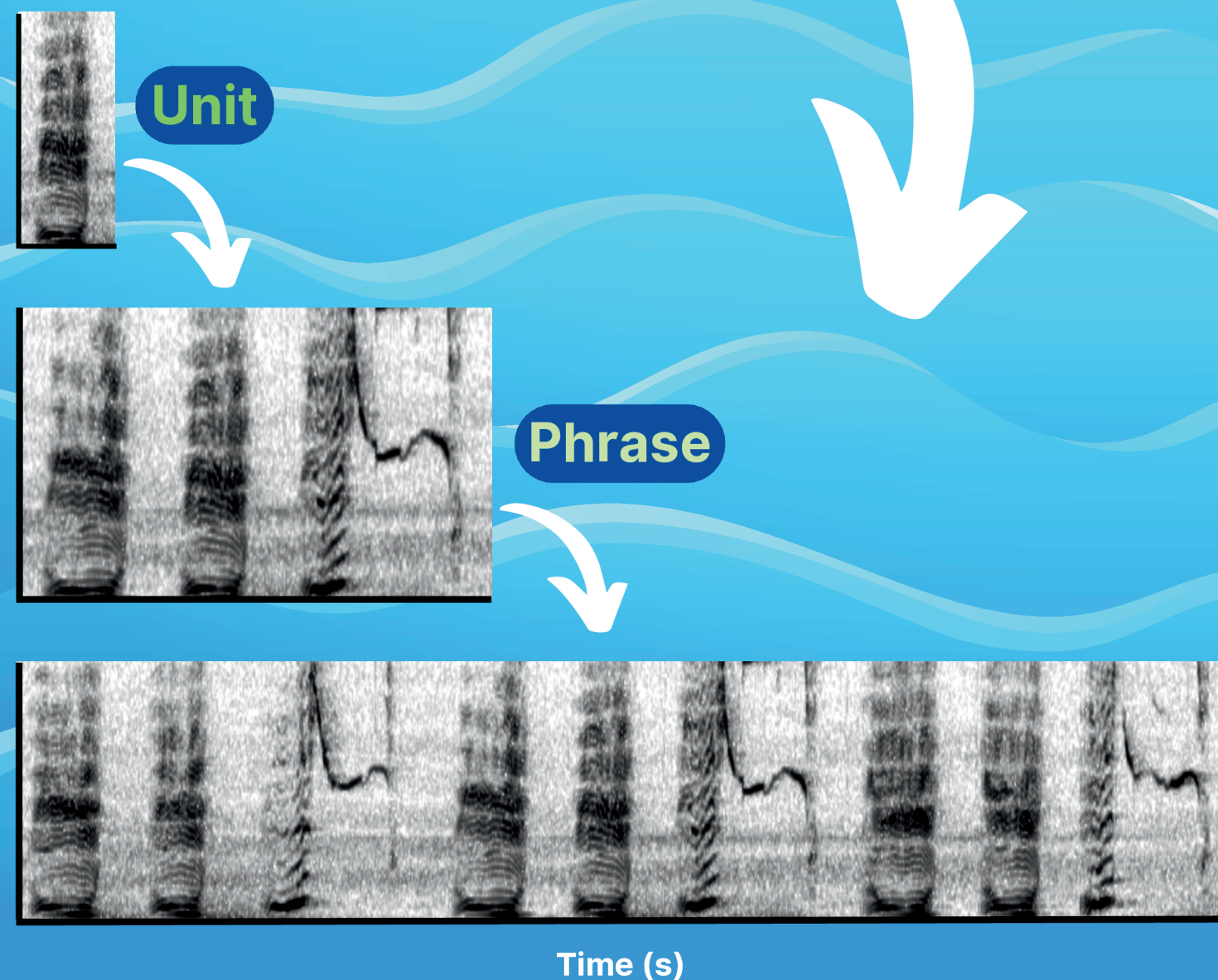


Next steps

- Analyse the rate over time at which song is evolving, how complexity changes, and when revolutions occur.
- Integrate with Photo-ID and genetic analyses.

Predictions

- Song could carry on across to South America, spanning the entire South Pacific.
- Likely to be more revolutions over time.
- The further away from where song originates, the more it deviates from the predicted pattern.



References

1. Darling & Bérubé, 2006, *Mar. Mammal. Sci.*
2. Allen et al., 2022, *Sci. Rep.*
3. Garland et al., 2021, *Phil. Trans. R. Soc. B.*
4. Garland, 2011, PhD Uni Queensland