

How dolphins listen to their mothers

May 24 2016, by Stephanie King, Sciencenetwork Wa



A bottlenose dolphin. Credit: Michele W

As far as a healthy parent/child relationship goes recognising each other is pretty important, despite whether the individuals are in the human or animal kingdom. Recently, UWA Oceans Institute researcher Stephanie King forayed into the underexplored area of dolphin vocal calls and how offspring learn how to identify their mum based on their 'signature

whistle'.

Recognising individuals plays an essential role in the behaviour of social animals as it allows them to recognise their offspring, identify their mates, and discern between friend and foe.

Individual recognition is particularly important in those animals that give birth to mobile offspring, like sheep, and in the cases where [mothers](#) leave their offspring for extended periods of time to find food, such as seals and sea lions.

One strategy particularly suited to overcoming these problems is the use of vocal signatures.

Bottlenose dolphins (*Tursiops truncatus*) are a highly social species that are well known for their use of acoustic recognition signals, termed signature whistles.

Each dolphin develops its own individual signature whistle in its first few months of life, which it uses to broadcast its identity.

Given that dolphin [calves](#) are highly mobile when born, we wanted to explore how mothers and calves recognised one another, and what mechanisms they might use to reunite with one another when separations occur.

For these studies, we worked with a group of bottlenose dolphins at the Dolphin Research Centre in Florida, USA.

First, we explored how female bottlenose dolphins used their identity signal, i.e. their signature whistle, in the weeks leading up to and following the birth of their calves.

Interestingly, female dolphins significantly increased their signature whistle use immediately after their calves were born.

In the first four weeks after the birth of their calves, they produced their signature whistles at over five times the rate that they did prior to giving birth.

This increase in maternal signature whistle production allows calves to imprint on their mothers' signature whistle in the first few weeks of their lives.



Two female bottlenose dolphins with their calves. Credit: Donald McMullen/Dolphin Research Center

This facilitates the calf's recognition of its mother's call before mother-

calf separations occur.

This is particularly important, as calves are not born with their own signature whistle, but develop it within the first few months of their lives.

Mothers may be unable to acoustically recognise their calf before this time, hence the necessity for a calf to recognise its mother's signature whistle in order to facilitate reunions in the event of separations.

This may have led to extended periods of vocal imprinting.

This is one of few studies to show the underlying mechanisms that facilitate long-term mother-offspring recognition immediately following parturition in a species with highly mobile young.

Second, we investigated the vocal behaviour of mothers as their calves grew older and became more independent.

We repeatedly asked a female dolphin to either retrieve her three-month-old calf, or to retrieve inanimate objects.

The female frequently used her signature whistle to retrieve her calf and rarely produced her whistle when asked to retrieve an object.

Thus, as the calf grows older and wanders further from its mother, she will use her signature whistle as a signal to indicate that she wants her calf to return to her.

The fission-fusion nature of the bottlenose dolphin social system inevitably leads to frequent separations and reunions between individuals, including mothers and their calves.

Together, these studies highlight the importance of vocal imprinting and maternal signature whistle use in aiding mother-calf reunions in [bottlenose dolphins](#).

It also significantly adds to a broader understanding of the use of mother-offspring identity signals in the [animal kingdom](#).

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