Lateralized eye use in bottlenose dolphins during group swimming at the Brookfield Zoo, Chicago

Dolphin lateralization is an emerging field of study using a variety of behavioral observations in captive and wild dolphins. Studies on lateralization in bottlenose dolphins have observed dolphin behavior and vision on a variety of tasks. Bottlenose dolphins have been observed in captivity looking at unfamiliar stimuli with their left and right eye. Mother-infant pairs in the wild also exhibit a degree of lateralization where infants tend to swim on the right side of their mother. Throughout the studies, there is consistency that dolphins use their left eye and right hemisphere preferentially in social contexts and when looking at unfamiliar humans and objects.

Bottlenose dolphins, the subjects of my thesis research, have a relatively small corpus callosum and laterally positioned eyes. The visual input from each eye completely crosses over to the opposite hemisphere. Each eye primarily receives input from one visual hemisphere, however there is a small region in front of the head where dolphins have binocular vision. The differential information received by each eye is especially interesting in social contexts when dolphins position themselves in groups.

While the previous research provides evidence for lateralized behavior and preferential use of eyes for particular contexts, there are no studies on eye use and positioning during group swimming in dolphins.

The video recordings of the dolphins at the Zoo provide a unique opportunity to study the dolphins in great detail over many months. This level of visual, spatial and acoustic detail would not be possible in the wild.

In my study, I am observing a captive population of six bottlenose dolphins in the Brookfield Zoo, Chicago. Through the Cognitive Science Distributed Cognition Lab, I have access to daily video recordings of dolphins from 8am-4pm. There are 13 cameras located around three tanks to provide nearly complete coverage of the three tanks. In my observational study, I record bottlenose dolphins’ behavior from 8:30am-9:45am (the first feed of the day). I’m using a sampling method where each time a group of dolphins passes by a specific window in the tank, I record the dolphins’ positions and their eye use. I’m recording the dolphins’ left/right position in the water, as well as their vertical position and forward/back position in the water.

I observed the dolphins over 26 days from March-April in 2013. I am currently in the process of analyzing the data from my observation sheets. I hope that the results of my study will contribute to the growing literature on dolphin eye lateralization and provide insight into how they preferentially use their eyes in social contexts.

Thank you for your consideration in the Cognitive Science Alumni Reunion poster session.