The ABSTRACT

Developmental and Other Age-related Aspects of Mirror-use by Bottlenose Dolphins

(Tursiops truncatus)

by

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Bottlenose dolphins are neuroanatomically different and evolutionarily divergent from primates yet they exhibit mirror self-recognition (MSR), a rare cognitive ability in non-human animals. This research investigated the developmental and age-related aspects of MSR in this species. During a longitudinal study, a social group of bottlenose dolphins at the National Aquarium, Baltimore, MD were exposed to a mirror and their behavioral responses were recorded to: 1) further confirm the presence of MSR in this species, 2) determine the age of emergence of MSR and 3) draw comparisons with data documenting the emergence of this ability in humans and great ape species. Based on previous research it was predicted that the dolphins in this study would demonstrate the ability for MSR. It was also predicted that due to the precocious motor and social development of bottlenose dolphin calves, MSR would emerge in dolphins at an age comparable to humans and chimpanzees. Results confirmed the presence of this ability in dolphins as all three of the dolphins tested passed the mark test. Results also supported the prediction that MSR emerges in dolphins at an age comparable to humans and chimpanzees and notably self-directed behavior was observed at an even earlier age in dolphins. Bayley, the youngest dolphin was observed demonstrating self-directed behavior in front of the mirror on her fourth day of mirror exposure, at ~5 ½ months of age. For all of the dolphins, almost no social behavior was observed on the first day of mirror exposure, which is not surprising because these
dolphins were not naïve to reflective surfaces. Findings from this study also contradict previous research with chimpanzees that has shown older individuals lose interest in the mirror. Nani, the oldest dolphin (~37 years), had less access to the mirror and yet spent more time at the mirror than Bayley. This research provides important insights into how highly encephalized species, like humans, apes, and dolphins compare developmentally with regards to the age of emergence and developmental stages of MSR. Documentation of such socio-cognitive development is critical to our understanding of the evolution of intelligence in the animal world.