SIGNATURE WHISTLES IN AN INTRODUCTION CONTEXT

MEGAN BROADWAY[1], JAMIE KLAUS[2], BILLIE SERAFIN[2], HEIDI LYN[1]

1 Psychology, University of Southern Mississippi
Long Beach MS, USA
megan.broadway@eagles.usm.edu, heidi.lyn@usm.edu

2 Institute for Marine Mammal Studies
Gulfport MS, USA

One key distinction that has been drawn between human language and animal communication concerns the increased flexibility in human language. In general, communicative systems in animals are considered associative and tied to specific contexts (Scott-Phillips, 2015). Specifically, complex and dynamic vocal communication systems are rare in the animal kingdom, being limited primarily to humans, birds, and delphinids (Janik, 2009). Because these flexible systems are so rare, comparisons between the taxa are important to understand the evolutionary pressures that have led to these systems. Traits which are present across species, such as vocal learning or the ability to reference objects such as the self and others, which are traits shared by humans and dolphins, may be key factors in the evolution of more complex communication systems. Most of what we know about the communication system of delphinids comes from the study of bottlenose dolphins (*Tursiops truncatus).* Although researchers have attempted to decode the communication system of these animals for more than 60 years, the discovery of signature whistles (Caldwell, Caldwell, & Tyack, 1990) has been one of the most promising findings. Signature whistles are distinctive calls that are unique for each individual, and like human language, are a product of vocal learning. Signature whistles primarily act as cohesion calls, and are used in sophisticated contexts such as when groups of dolphins encounter one another in the wild (Quick & Janik, 2012). These calls likely developed due to the limited visibility of the underwater environment and the highly social nature of these animals. It has been suggested that signature whistles may be used self-referentially and to reference others (King & Janik,

2013), similarly to how humans use names (see Janik & Sayigh, 2013). If so, this would be one of the only species to use names to identify individuals and would allow researchers to study the conditions under which reference to self and others arise. Still, the nuances of signature whistle usage remain largely unknown with only a few, un-replicated experimental studies.

One context where these whistles are likely to be used is during the introduction of a new dolphin to an established group. For this study, a new dolphin was introduced to two established residents over an extended period of time by first adding the new individual to an adjoining pool where he was housed for several months and then allowing all three dolphins to swim together freely. Vocalizations and behavioral data were collected before, during, and after the introduction. Underwater vocalizations were recorded using an array of hydrophones to determine if and when signature whistles were used over the course of the extended introduction period (Fig. 1). These data will later be compared to a follow-up study where an additional dolphin was introduced to this group. Further studies based on context dependent interpretations of signature whistles will help to clarify the social and environmental factors that contribute to the evolution of flexible communication systems like human language.

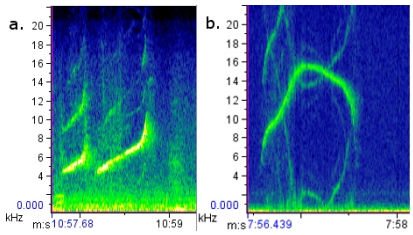

Figure 1. Examples of signature whistles from two of the dolphins.

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