

# Social Development in the Neonatal Beluga Whale (*Delphinapterus leucas*)

Elizabeth George, Meredith Brown, Danelle Capobianco, Alexandra Ferrente, Ashley Holmes, Jenny Inzero, Justin Miller, Kimberly Patterson, Lyndsey Pierson, Vance Reeds, Timothy Servoss, Laura Stevens, Amanda Torre, Melissa Young & Michael Noonan

Canisius College, Buffalo, NY

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## Introduction

Due to their remote Arctic habitat, very little is known about the natural history of beluga whales. Preliminary surveys indicate that births take place during summer months, at a time when the sexes are segregated. However, to date there is no detailed information available pertaining to the typical social milieu into which baby belugas are born, nor are any details available about their subsequent socialization.

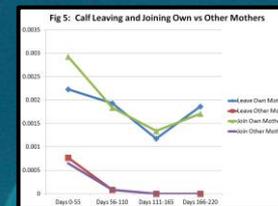
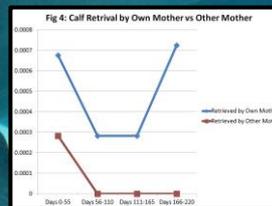
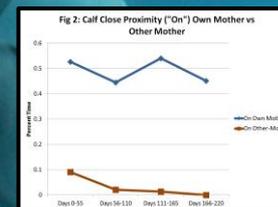
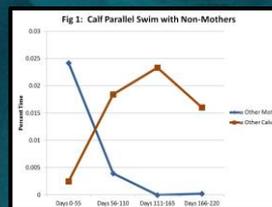
The present study was designed to illuminate these topics by documenting the social contacts made by three baby belugas born into captivity. The investigation focused on the degree to which allo-mothering occurred, the social mechanisms by which maternal-infant pairs were maintained, and the age at which the young belugas started to interact with age-matched peers.

## Methods

The subjects of this investigation were three captive born beluga whales (*Delphinapterus leucas*) held at Marineland of Canada. They were housed in a one-million liter pool with six wild-caught adults of Chuckchi Sea origin.

Using a focal-animal, ethogram-based paradigm, behavior was recorded via underwater viewing windows. The position in the pool of each baby whale, and each calf's movements in relationship to the other whales, were recorded on a second-by-second basis, over three nine-minute periods, two times per week, over seven months.

Any two whales swimming in the same direction and speed within three meters of one another were considered in "Parallel Swim". When a baby was within one meter of an adult, it was considered "On" the adult. Whenever two whales made physical contact, they were considered "touching". When an adult swam to within two meters of an independently swimming calf with the result of initiating a parallel swim with the calf, it was considered a "retrieval". Whenever a calf's swimming moved it farther than three meters from an adult, it was considered having "left" the adult, and whenever its swimming moved it within three meters of an adult, it was considered having "joined" the adult. Whichever animal's swimming effected a greater closeness between two whales, that animal was considered having "initiated" the closeness.



## Results

Utilizing a series of multi-level Poisson regression analyses, all of the following proved to be statistically reliable ( $p < .001$ ):

### Parallel Swimming (Fig 1)

- At all ages, the calves spent approximately 65% of their time parallel swimming with their own mothers.
- When it did occur, calf parallel swimming with other whales was initially more common with other mothers, and later more common with other calves.

### Close Proximity (Fig 2)

- At all ages, the calves spent approximately 50% of their time "on" their own mothers.
- They spent approximately 10% of their time "on" other mothers during the first two months, and then only rarely thereafter.

### Touching (Fig 3)

- Calves touched their own mothers more frequently than other mothers.
- The frequency of touching was highest in the first two months, decreasing significantly for touches on own mothers, and essentially disappearing for touches on other mothers.

### Calf Retrieval (Fig 4)

- When swimming separately, calves were retrieved more often by their own mothers than other mothers.
- Calf retrieval by other mothers occurred only during the first two months.

### Calf Leaving and Joining Others (Fig 5)

- Calves left and joined their own mothers less frequently with increasing age.
- Calves only left and joined other mothers during their first two months.

### Mother-Calf Reunions (Fig 6)

- Following those occasions when mothers and calves were temporarily separate, calves initiated reunions more often than did mothers, but they did so with decreasing frequency over time.

## Discussion

It is not surprising that Parallel Swims, Close Proximity, and Touching are more frequent with own-mothers than with other-mothers. That such associations with other-mothers occurred most often during the first two months may reflect an initial period of confusion during which more exclusive mother-calf bonds are still being formed.

That mother retrievals of calves occur less frequently than calves rejoining their mothers suggests that it is the offspring that carry most of the burden of maintaining the maternal-infant relationships in this species. This suggests the use of a "follower" type maternal-infant system comparable to that seen in many artiodactyla species.

That babies "left" their mothers less frequently with increasing age may simply reflect a gradual tightening of mother-calf bonds over the first half year. It is interesting that the frequency of calf "leaving" does begin to increase slightly after 165 days of age. This may suggest the beginning of a new stage in which the calves begin to assert their independence.

Although bouts of Parallel Swimming with other calves occurred only rarely during the period under investigation, that the frequency of such events jumped markedly upward after the first two months suggests a progression from one stage of development to another.

It is hoped that the results obtained here can be used as norms against which the development of other beluga calves can be judged, and that they increase our understanding of an important cetacean species.

## Acknowledgements

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