

AGGRESSIVENESS, DOMINANCE AND RECONCILIATION IN BOTTLENOSE DOLPHIN (*Tursiops truncatus*) FEMALES DURING PREGNANCY AND AFTER BIRTH

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Bottlenose dolphins are social animals, particularly they share a plenty of social behaviours, either affiliative or aggressive. The existence of dominance hierarchies and post-conflict reunions have been demonstrated, but no specific research has been conducted on females until the present time.

The main purpose of this study was to analyse aggressiveness levels, dominance relations and post-conflict behaviour which occur in female bottlenose dolphins, during the last three months of pregnancy and six months after birth.

Focal observations have been conducted on two females, a dominant one (Alfa) and a submissive one (Beta) hosted at Rimini's Delphinarium. Comparative data on three births – one female and one male from Alfa and one female from Beta – have shown that the dominant female presents lower level of

aggressiveness and is more inclined to threat rather than to aggress. The submissive female revealed a higher conciliatory tendency than the dominant one, according to the theory of the "valuable relationship". Clue has shown that analysing aggressiveness towards calves, the multiparous female Alfa presents higher levels of aggressiveness towards her calves in comparison with the primiparous one Beta, but both females rather prefer to threat their own calves weakly. Gender of calf seems to definitively influence the aggressive behaviour towards mother. In fact, only the male calf shows an increasing of aggressiveness towards the mother over the time.

This preliminary data open a new scenario on the study of females' aggressiveness in mammals and suggest a new research topic on the development of agonistic behaviour in growing up bottlenose dolphin calves.

METHODS

- 74 hour focal observations on Alfa (a multiparous female) during six months post-partum of Luna (May- October 1995); 209 hour focal observation on Beta (a primiparous female) during three months pre- and six months post-partum of Blue (April 1997-December 1997); 242 hour focal observations on Alfa during three months pre- and six months post-partum of Rocco (July 2003-March 2004)
- Analysis of data were structured by software Observer 3.0
- "Aggressive" behaviour: *bite, chase, direct open mouth, tail hit, rostrum hit, jaw clap, body slam, clasp, hold down*; "affiliative" or "peace-making" behaviour: *rubbing, contact, belly presentation, bonding*
- Measured parameters: rate of affiliative and aggressive behaviours; directionality, duration and outcome of aggressions; latency of the first affiliative behaviour after conflict
- Data analysis: ANOVA on average frequencies and duration; regression analysis on average frequencies; Dominance Indexes (Moss & Watson 1980; Eden 1987); Corrected Conciliatory Tendency (Veenema *et al.* 1994)



Name	Gender	Birth's Date	Reproductive State	Origin
Speedy	M	1970 (presumed)	Adult	Adriatic Sea (Pescara)
Alfa	F	1979 (presumed)	Adult	Gulf of Mexico (Campeche)
Sole	M	03/05/1993	Juvenile	Rimini's Delphinarium (Alfa + Speedy)
Luna	F	12/05/1995	Juvenile	Rimini's Delphinarium (Alfa + Speedy)
Rocco	M	27/09/2003	Calf	Rimini's Delphinarium (Alfa + Speedy)
Beta	F	1981 (presumed)	Adult	Gulf of Mexico (Campeche)
Blue	F	26/06/1997	Juvenile	Rimini's Delphinarium (Beta + Speedy)

RESULTS

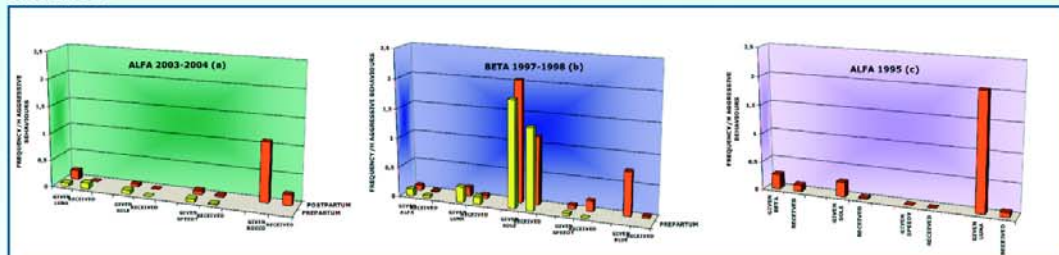


FIG. 1: Selectivity of female aggressiveness given and received. Data show that the multiparous female Alfa is more aggressive towards her calves, while the primiparous Beta is more aggressive mainly towards the juvenile male Sole. As result, Beta is submissive and expected to react to others aggressiveness

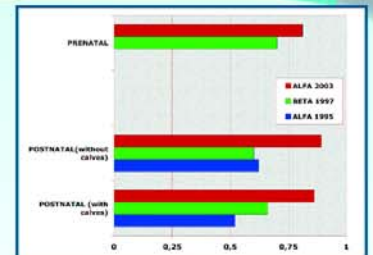


FIG. 3: Eden's dominance index in Alfa and Beta, including and excluding calves. Alfa's values result higher than Beta's

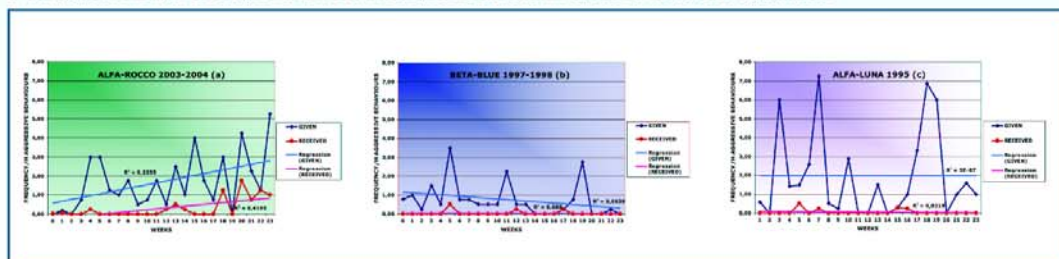


FIG. 2: Over time trend of female aggressiveness given and received from calves. Only the male calf Rocco shows an increasing of aggressiveness towards his mother during the first six months of life

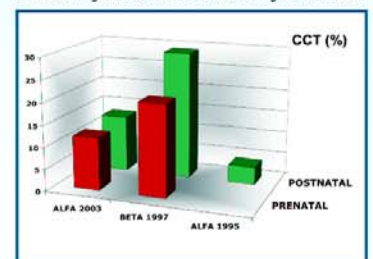


FIG. 4: CCT of focal females in the different study periods. Beta shows higher conciliatory tendency than Alfa

CONCLUSIONS

Female social position is supposed to influence aggressive levels, performance and conciliatory tendency. Thus, dominant female is less aggressive towards group members, she threatens more rather than aggress and is more inclined to reconciliation, according to the "valuable relationship hypothesis" (de Waal & Aureli 1997). In this study, in multiparous female aggressiveness towards calves seems to be higher,

but females prefer threat rather than aggress their own calves. The aggressiveness of calves towards mothers and its trend vary during time according to the gender of calves. The influence of controlled conditions on these behaviours is still unknown. Further researches are necessary to proceed the study of these behaviours in calves and selectivity in post-conflict reunions in bottlenose dolphins.

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