Why Dolphins Age Slower in Small Social Groups and Age Faster in Larger Groups: A Possible Explanation Based on Decision Theory

Dang Pham[1], Javier Molina[1], Olga Kosheleva[2], and Vladik Kreinovich[1]
Departments of [1]Computer Science and [2]Teacher Education
University of Texas at El Paso, 500 W. University,
El Paso, Texas 79968, USA, dpham2@miners.utep.edu,
jmolina24@miners.utep.edu, olgak@utep.edu, vladik@utep.edu

Abstract. A recent paper has shown that dolphins living in small social groups age slower than solitary dolphins, but dolphins living in larger social groups age faster than solitary dolphins. That paper provided explanations based, to some extent, on the specifics of the social life, with its mutual help and – at the same time – stressful conflicts. The current talk intends to provide a more general explanation of the newly observed phenomena, an explanation based on the ideas of the general decision theory.

Formulation of the problem. A recent paper [1] has shown that:

- dolphins living in small social groups age slower than solitary dolphins, but
- dolphins living in larger social groups age faster than solitary dolphins.

That paper provided explanations based, to some extent, on the specifics of the social life, with its mutual help and – at the same time – stressful conflicts. The current paper intends to provide a more general explanation of the newly observed phenomena, an explanation based on the ideas of the general decision theory.

Why decision theory? In general, aging is related to the quality of life: people and animals living in better conditions usually age slower, while people and animals living in worse conditions age faster.

How can we gauge the quality of conditions? The need to gauge – and compare – different alternatives comes from the need to help decision makers decide which options are better. For this purpose, a special *decision theory* was designed. In this theory, decision maker's preferences are described by a special function called *utility*: the larger the utility, the more preferable the alternative.

In decision-theory terms, the observations from [1] can be described as follows:

- the utility of persons living in small social groups is larger than the utility of solitary persons, while
- the utility of persons living in larger social groups is smaller than the utility of solitary persons.

To explain these observations, we need to recall what utility theory says about the effect of social groups on utility.

References

[1] L. Gerber, K. J. Peters, S. L. King, S. J. Ailen, R. C. Connor, O. Forbes, K. G. Holmes, A. M. Kerans, E. P. Willems, M. Krützen, and L. A. Rollins, "Social bonds decrease epigenetic age in male bottlenose dolphins", *Communications Biology*, 2025, Vol. 8, Paper 1765, doi 10.1038/s42003-025-09227-w