The effects of vessel traffic on the behavioural pattern of common dolphins, in Tagus Estuary (Portugal)
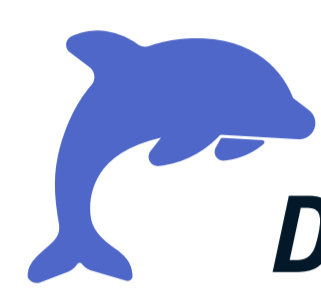
Silva

MARE

AR NET

Ispa

Silva, I. M., Jesus, N., Couto, P. A., & Luís, A. R.

MARE – Marine and Environmental Sciences Centre/ ARNET – Aquatic Research Network, Ispa – Instituto Universitário de Ciências Psicológicas, Lisboa Portugal

INTRODUCTION

Delphinus delphis visit Tagus estuary frequently.

Lisbon area has a high maritime traffic
Commercial and recreational vessels are frequent year-round

OBJECTIVE: understand the effects of maritime traffic on the behaviour of common dolphins

METHODS

LAND-BASED OBSERVATIONS
Continuous horizon "scanning" method
5-min sample

March 2022
September 2022

8 am – 4 pm
On/Off observation days

Fig. 1 – Study Area. The red triangle represents the VTS tower where land-based observations were carried out.

Video & Audio recording

Data collection:
- Species and group composition
- Behaviour pattern
- Presence/Absence of vessels
- Reaction to Vessels
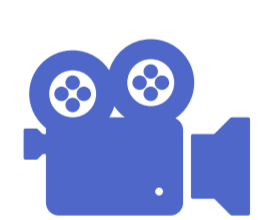
Statistical Analysis

BEHAVIOURAL BUDGETS — **Mann-Whitney U test** to compare the activity behaviour budget in the absence/presence of vessels

REACTION TO VESSELS — **Generalized Estimating Equation** to analyse the reaction to vessels with the behaviour through baseline categories (neutral reaction and travelling)

BEHAVIOURAL TRANSITIONS — **Markov Chains** to calculate the behavioural transitions probabilities in two different scenarios:
- Control (Absence of Vessels)
- Impact (Presence of Vessels)

RESULTS & DISCUSSION

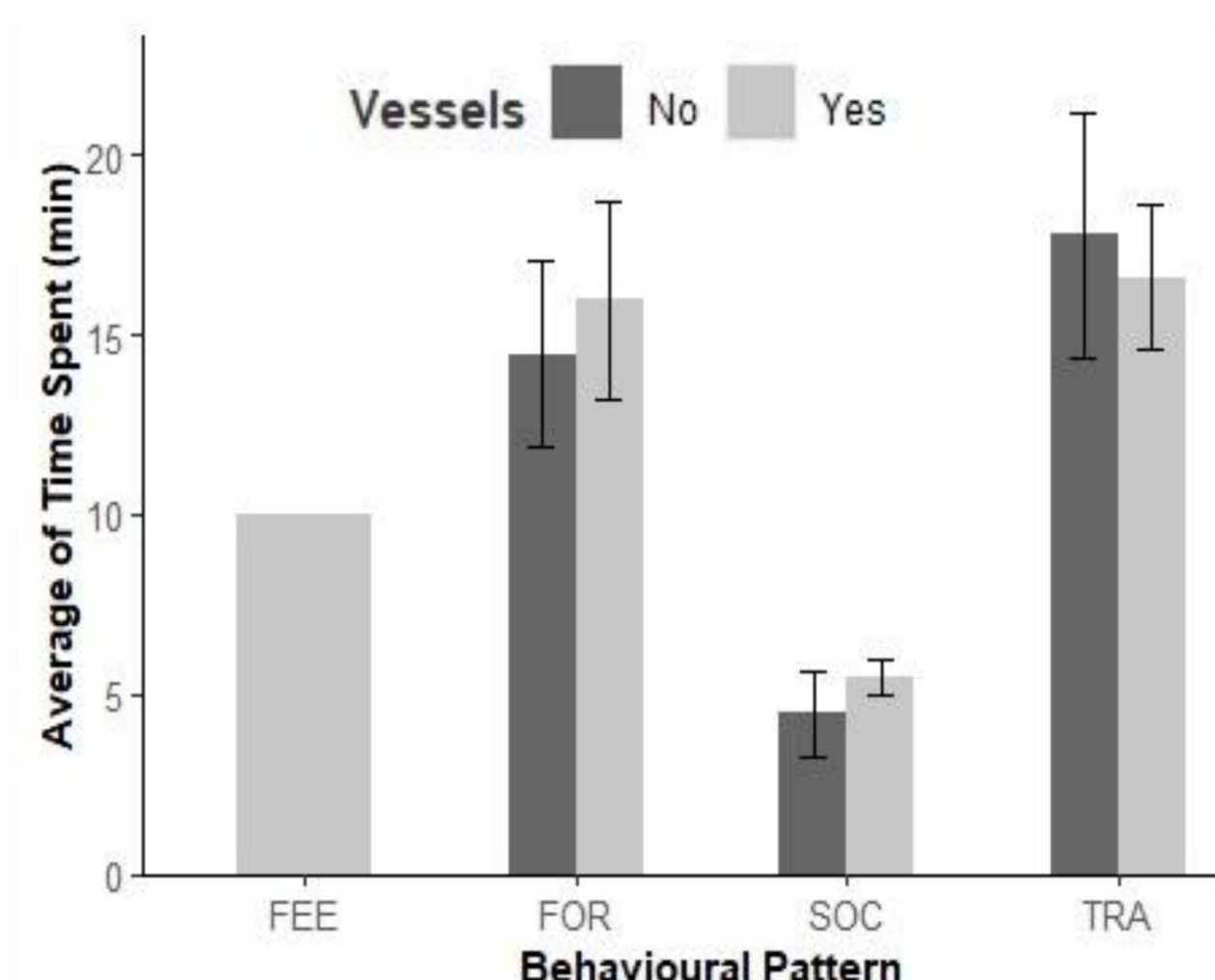**≈ 33 hours of dolphins sightings were analysed (N = 50)**

Fig. 2 – Behavioural budget of dolphins in the absence and presence of vessels. FEE – Feeding; FOR – Foraging; SOC – Socializing; TRA – Travelling.

RESULTS FIG. 2 — **Increase** in foraging and **decrease** in travelling activities when vessels are present

RESULTS FIG. 3 — Most of the encounters **have a neutral response**

RESULTS FIG. 4 — Transitions probabilities between **foraging – travelling** and **socializing – travelling increase** when vessels are present
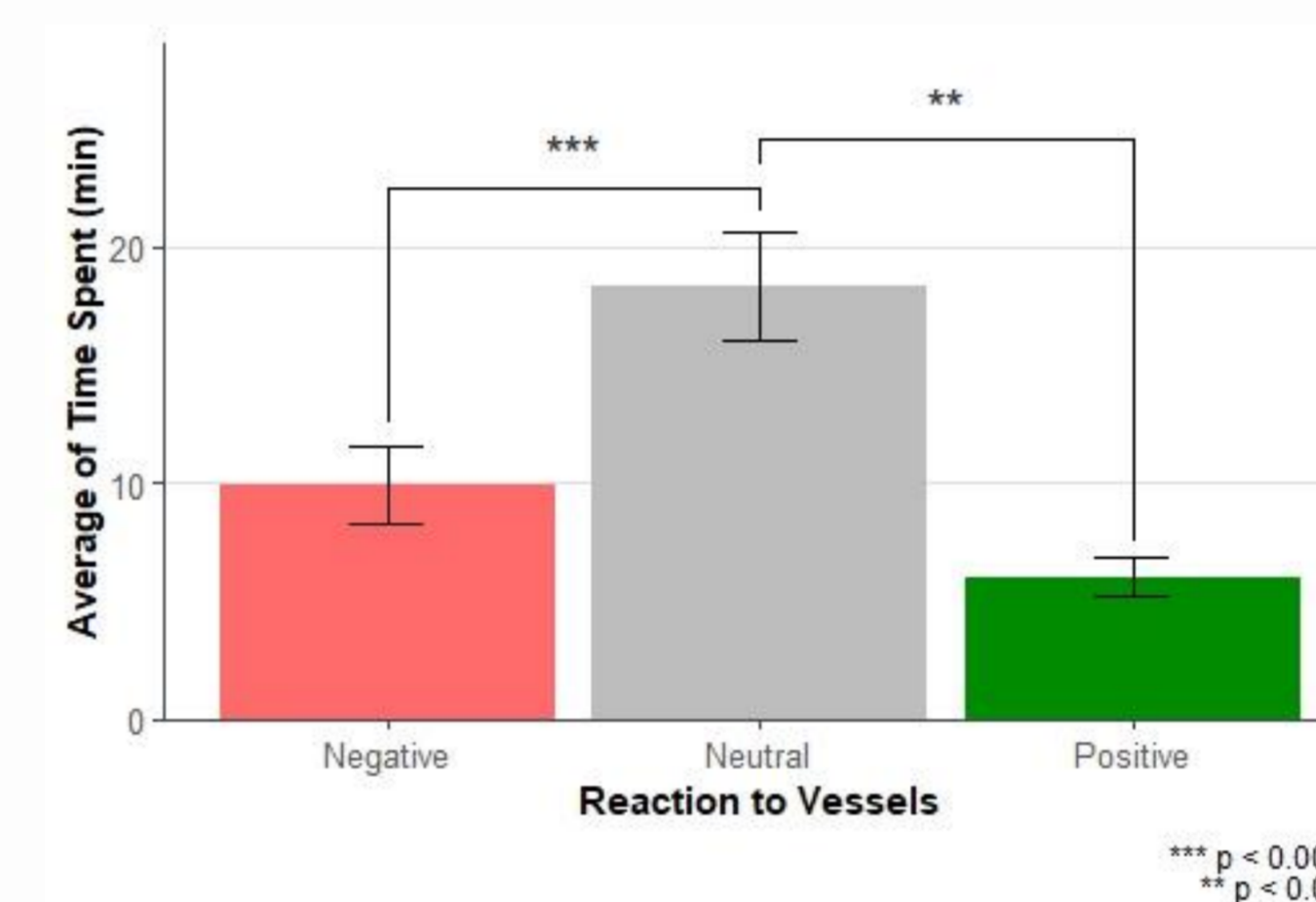
These results suggest that maritime traffic may affect common dolphins' behaviour. However, it's not yet possible to establish a clear link.

Fig. 3 – Average of time spent in reactions to vessels.
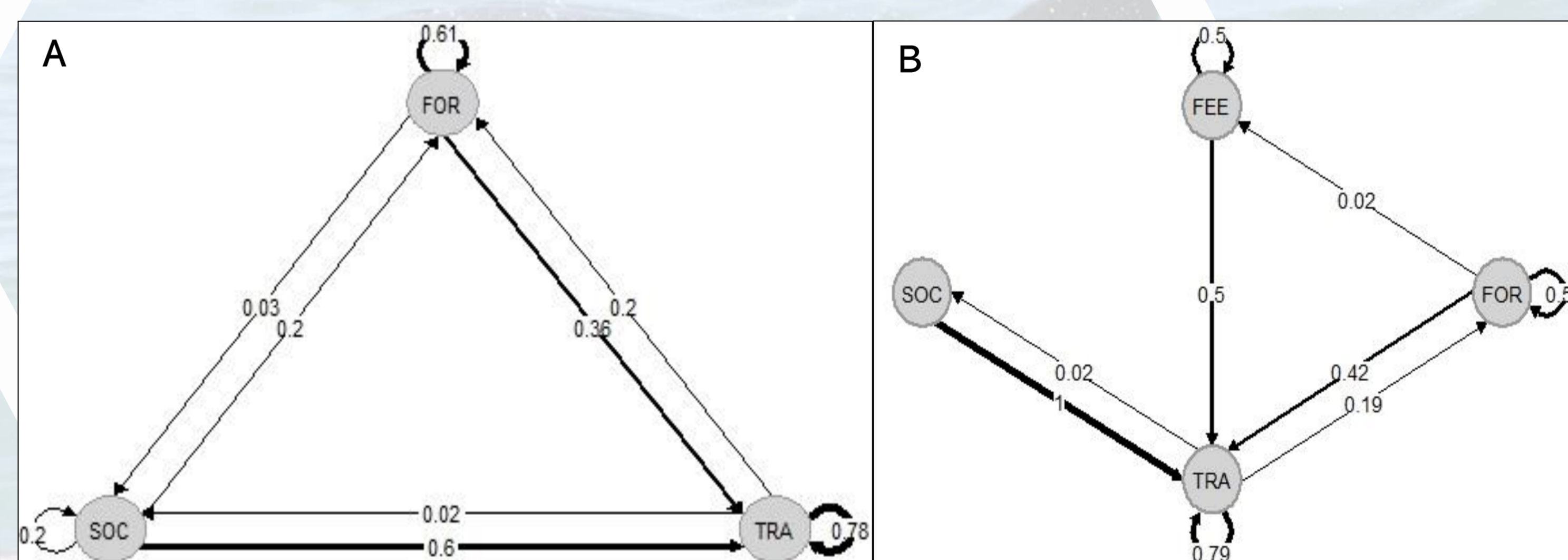
*** $p < 0.001$
** $p < 0.01$

Fig. 4 – Markov chains representing behavioural transition probabilities: (A) control chain; (B) impact chain. FEE – Feeding; FOR – Foraging; SOC – Socializing; TRA – Travelling.

FINAL CONSIDERATIONS

This study is the **first insight** into the interactions between dolphins and vessels **in the Tagus region**.

Long-term studies in this region can provide useful conservation tools regarding vessels' potential effects, especially in a blooming dolphin-watching area.

SCAN ME

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Background photo: Miguel Couchinho