A pilot study of hierarchy, agonism and aggression in a group of domestic cats while feeding

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INTRODUCTION & AIM

In stable groups of cats, interactions such as territorial defense and competition for resources may be dynamic and subject to variation[1]. Simultaneous feeding can promote the emergence of aggressive behaviors associated with defending or claiming food, and it provides a useful context for identifying changes in social hierarchy among companion animals[2]. Social hierarchy can be assessed by describing aggressive behaviors displayed during feeding. Evaluating the cat's behavior is a first step towards identifying the cause and being able to implement strategies to reduce aggression[1,2].

The aim of this study was to explore the identification of hierarchical positions occupied by individuals within a group of domestic cats by evaluating the frequency of aggressions performed and received during food offering.

METHOD

This study was conducted in a household located in Mérida, Yucatán. Four cats (three females and one male), all neutered and aged between 3 and 6 years, were included in the study (**Fig. 1 and 4**). To avoid bias, observations were conducted in the cats' home environment by a familiar observer, using their regular diet (**Fig. 6**).

Figure 1. Cat 1 *(Oreo, 6 years).*

Figure 2. Cat 2 *(Estela, 6 years).*

Figure 3. Cat 3 *(Sol, 5 years).*

Figure 4. Cat 4 *(Toti, 3 years).*

Observations were conducted over 14 consecutive days, with a fixed duration of 10 minutes at a previously established schedule (**Fig.5**). During this period, the frequencies of agonistic and aggressive behaviors performed and received by each cat were recorded before feeding. In addition, the sessions were video-recorded to support data collection. The observed behaviors are described in **Table 1.**

Table 1. Behaviors observed in this study.
1. **Swat:** Single paw hit to head.
2. **Boxing:** Repeated hits.
3. **Body strike:** Paw hit to the body.
4. **Brief bite:** Bite ≤ 1 second.
5. **Sustained bite:** Bite > 1 second.
6. **Tackle:** Jumping or lunging.
7. **Hold:** Grab with front legs.
8. **Fight:** Upright fighting.

Figure 5. Feline subjects awaiting feeding.

Figure 6. Daily feeding of the subjects.

Based on the recorded behaviors, individual aggressiveness indices were calculated as follows (Adapted from Barroso *et al.*, 2000):

$$\text{Aggression Index} = \frac{\text{Aggressions performed}}{(\text{Aggressions performed} + \text{Aggressions received})}$$

In addition, aggressiveness frequencies were analyzed using a chi-square test.

RESULTS & DISCUSSION

The results showed that the most frequent behavior was **Body** strike, whereas the least exhibited behavior was **Hold**. The individuals that displayed the highest number of aggressive acts were *Cat 1* and *Cat 4*, while *Cat 2* received the highest number of aggressions (**Fig. 7**).

The cumulative frequency of aggressive acts performed and received over the two weeks of the study differed significantly among cats (P < 0.0001) (**Fig. 8**).
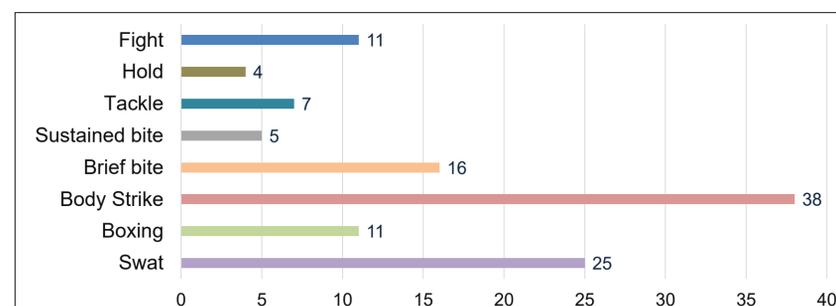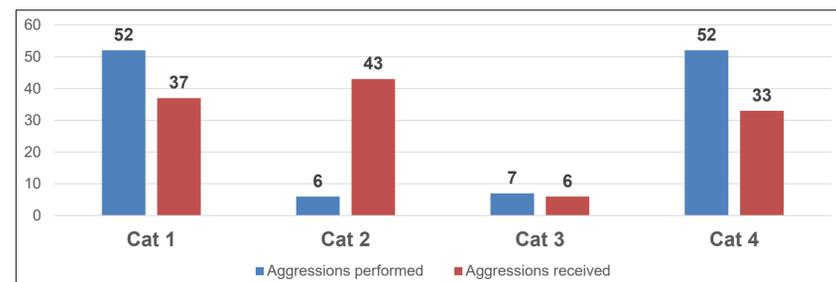

Figure 7. Total number of behaviors observed.

Figure 8. Comparison of the cumulative frequencies for each individual, the P-value in Chi-square = 1.358e-07.

Cat 4 was identified as the dominant individual (dominance index ≈ 1), whereas *Cat 2* showed the lowest hierarchical rank (**Fig. 9**). Cat 2 tends to avoid conspecifics, as subordinate individuals typically avoid dominants, which may intimidate, chase, restrict access to food, or attack to reinforce dominance[1,4]. However, these results should be interpreted cautiously due to the small sample size.
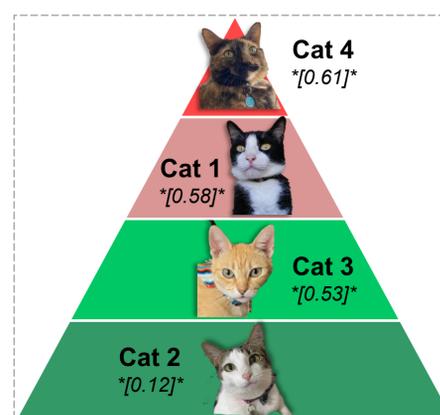

Figure 9. Hierarchy based on estimated aggression indices.

Figure 10. Aggressive behavior among individuals.

CONCLUSION

It is concluded that measuring aggression in a feeding context allows us to identify the dominant individual and the one of lower hierarchy who could face problems in their well-being.

FUTURE WORK / REFERENCES

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