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# Ontogeny of personality in roe deer (*Capreolus capreolus*)


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## Introduction

Personality is often described as individual differences that are consistent across time and context [1]. Numerous traits are often used to characterize personality, such as sociability, aggressiveness, exploration, boldness and neophobia [2]. The existence of personality in the animal kingdom is not yet admitted by the entire research community, and relatively few studies have investigated the ontogeny of personality [3]. This longitudinal study explored if roe deer (*Capreolus capreolus*) exhibited consistent individual differences (personality) in a neophobic situation, and if said personality evolved throughout the years (fawn to adulthood).

1/ We first hypothesized that roe deer would indeed exhibit consistent individual differences and confirm the existence of personality in this species.

2/ Secondly, we hypothesized that personality would stay consistent across time (both fawns and adults would show unique personality profiles).

## Materials and Methods

### Experimental setting



Gardouch experimental station, INRA (National Agronomy Research Institute) near Toulouse, France.

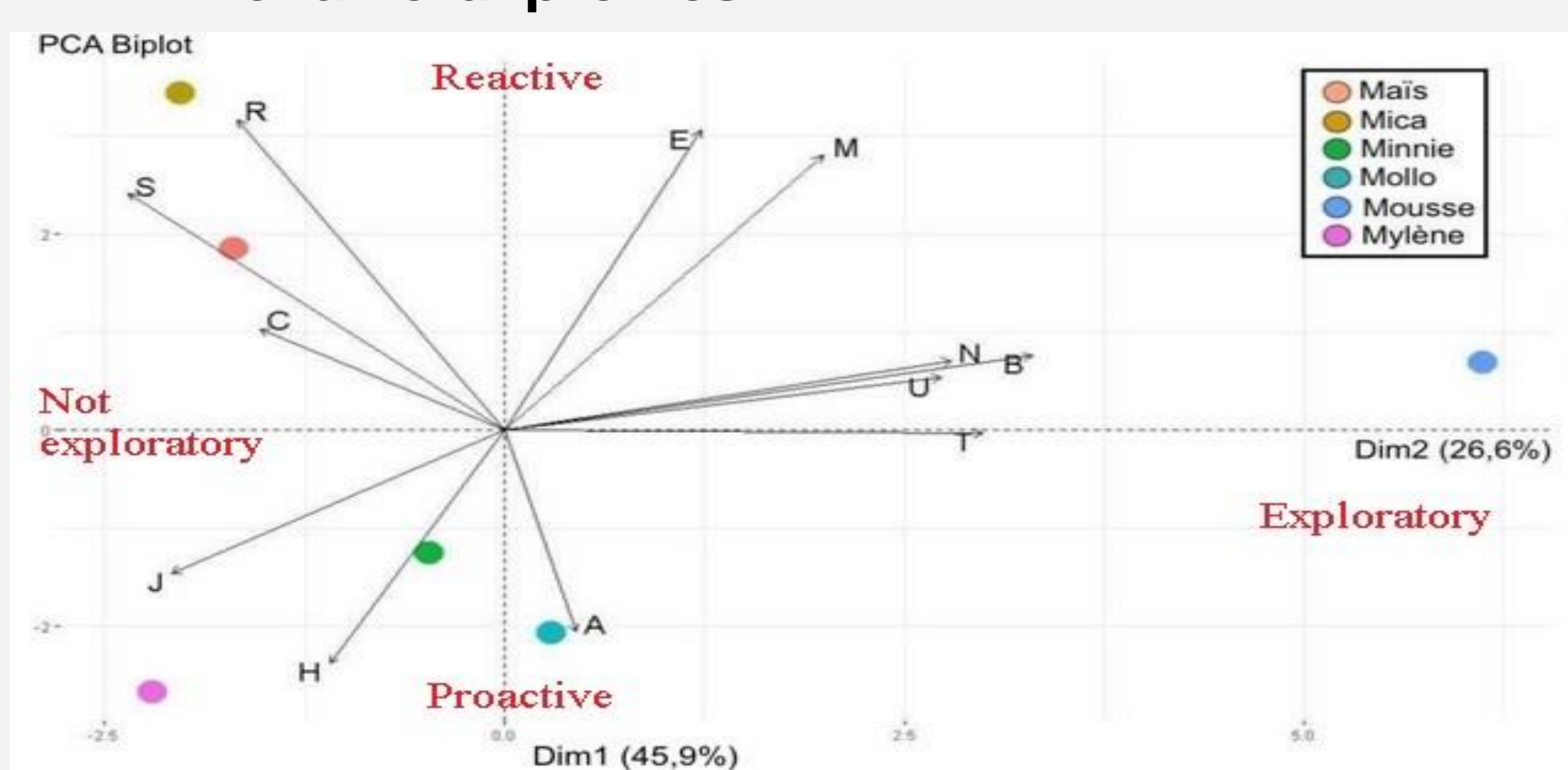
- “Novel object” test : a novel object was placed in a familiar environment
- The behavior of six females was recorded using the "continuous recording" method for 5 minutes.
- Total of 42 videos (6 females, 7 sessions)
- Behavioral repertoire of 18 behaviors

### Analyses

- Repeatability of relevant behaviors to neophobia.
- PCA (Principle Component Analysis) to visualize correlations between behaviors and identify potential profiles.
- Comparison of cohort at 1 and 3 years old to show consistency in time.

## Results and Discussion

### Behavioral profiles



- Axis 2 captures individuals' activity, opposing reactive individuals on its positive pole (avoid stimulus, focus on feeding) and proactive individuals on its negative pole (actively seek to interact with object).
- Repeatability ( $R = 0.276$ , 95% CI [0, 0.592],  $p = 0.008$ ).

Results confirmed hypotheses as individual differences were found to be **consistent across time** (fawn to adult) and relevant behaviors to neophobia were **repeatable**. Our results suggest that roe deer have different behavioral profiles that are consistent in their lives in relation to their reaction to novelty.

### Behavioral tendencies : comparison at 1 and 3 years old.

Subjects	1 year old (2013)	3 years old (2015)
Maïs	Bold – low feeding	Shy
Mica	Shy	Shy
Mollo	<b>Shyest</b>	<b>Shyest</b>
Mousse	Shy	Bold – most vigilant
Minnie	Shy	Bold
Mylène	<b>Boldest</b> – low locomotion	<b>Boldest</b> – low feeding

- Comparison showed that boldest and shyest behavioral profiles stayed consistent over time.

## Conclusion

The findings of our longitudinal study of the existence and ontogeny of personality in roe deer exposed to a novel object context show a **time consistency of distinct behavioral profiles** [4]. This experiment is part of a larger ongoing project as multiple cohorts are being tested at 1 and 3 years old both in novel object and isolation context at the CEFS. Roe deer behavior is thus being studied in **different contexts** and at **different life stages** which could bring us an answer on the existence and ontogeny of personality in this species.

### References

[1] Sih et al. 2004, *Q Rev Bio*, 79, 241-277  
[2] Réale et al. 2007 *Biol Rev*, 82, 291-318

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[4] Koolhaas 1999 *NeuroSci. Biobehav. Rev.*, 23, 925-935

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