

## Evolution of taxonomic and thematic links in semantic memory across the lifespan

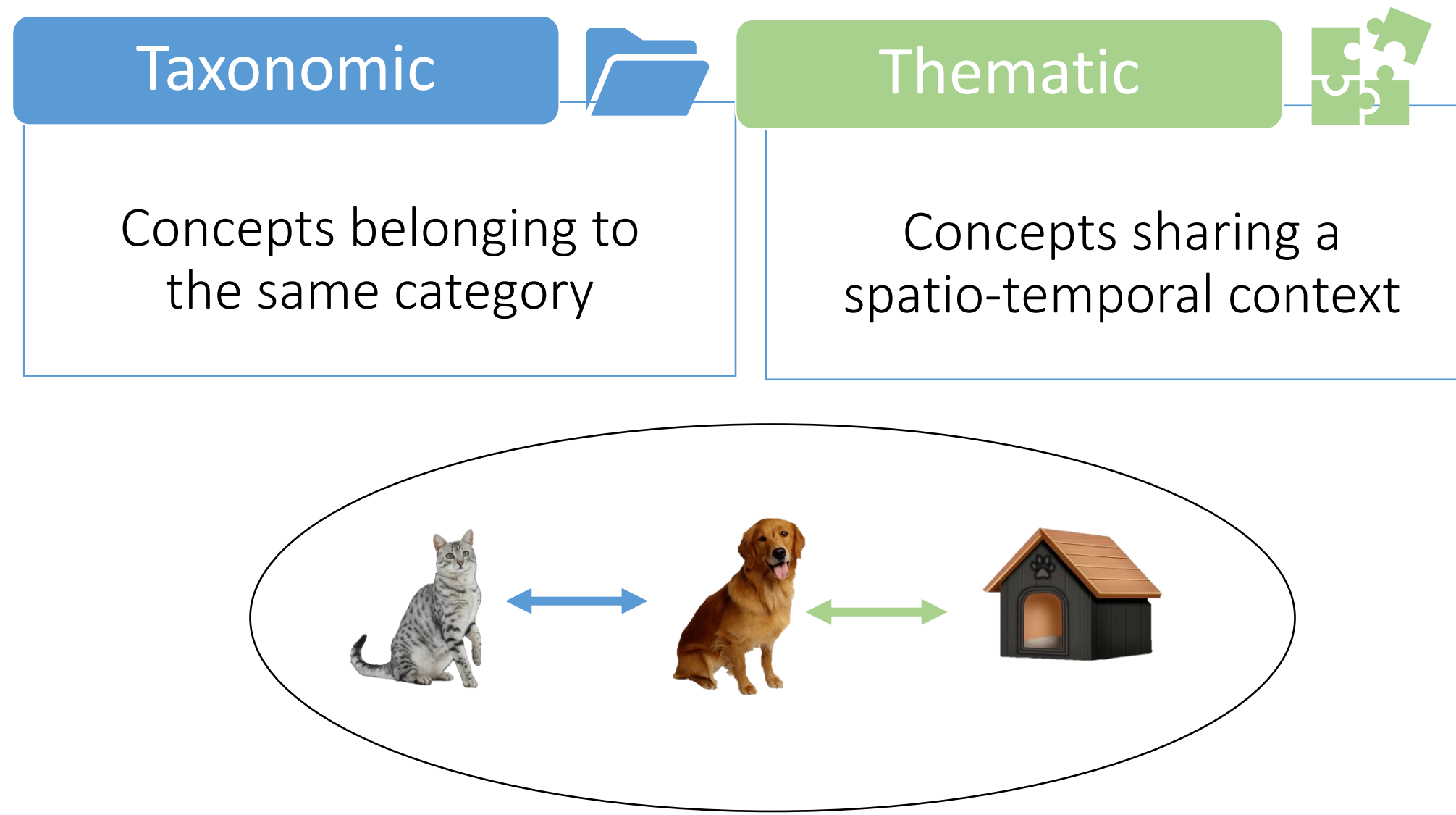
Simoes Loureiro, I. Wauthia, E. Besin, R., Miceli, A. & Lefebvre, L.  
Cognitive Psychology and Neuropsychology department,  
Institute of Health Sciences and Technologies, University of Mons, Belgium  
Contact : [isabelle.simoessloureiro@umons.ac.be](mailto:isabelle.simoessloureiro@umons.ac.be)

### Introduction

Semantic memory contains general knowledge about the world that are progressively stored in a network across the lifespan.

**Thematic** and **Taxonomic** links are two complementary, but distinct systems in this network (Mirman, 2017).

In this study, we aim to explore the lifespan evolution of both systems.



### Hypotheses

Semantic development

- Progressive development of semantic knowledge across the age
- Preservation of semantic knowledge in the elderly

Thematic versus taxonomic system

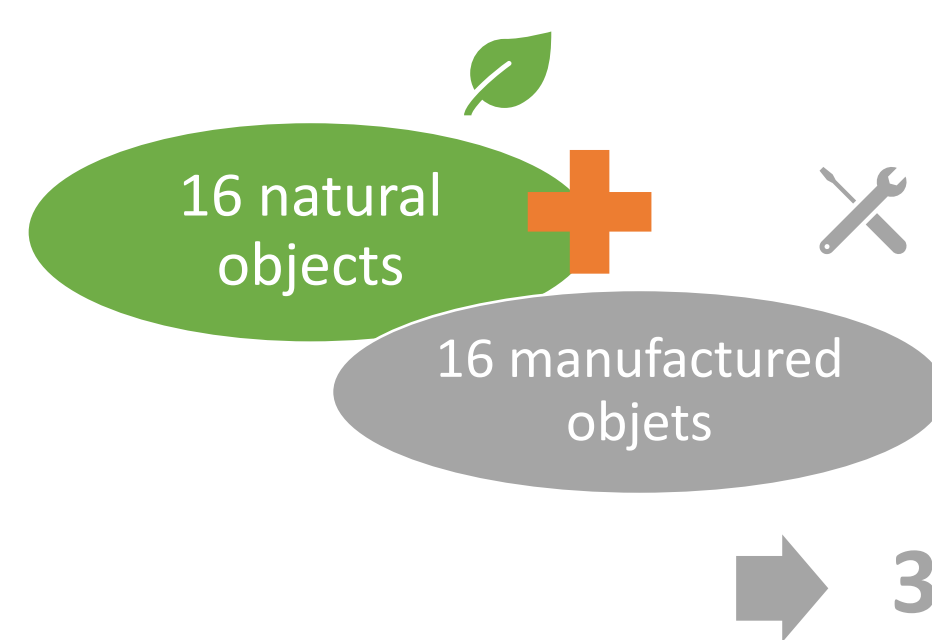
- Saliency of the *thematic* system over the *taxonomic* one across the age

### Methodology

#### Population

5 years old	7 years old	9 years old	Young adults	Elderly
(N = 11)	(N = 14)	(N = 14)	(N = 17)	(N = 16)
5,32 years ±0,24	7,43 years ±0,25	9,33years ±0,25	20,35 years ±1,77	70,69 years ±5,63
6♂/5♀	8♂/6♀	2♂/12♀	6♂/11♀	6♂/10♀
No depression, anxiety, learning disabilities, cognitive troubles or sensorimotor difficulties				

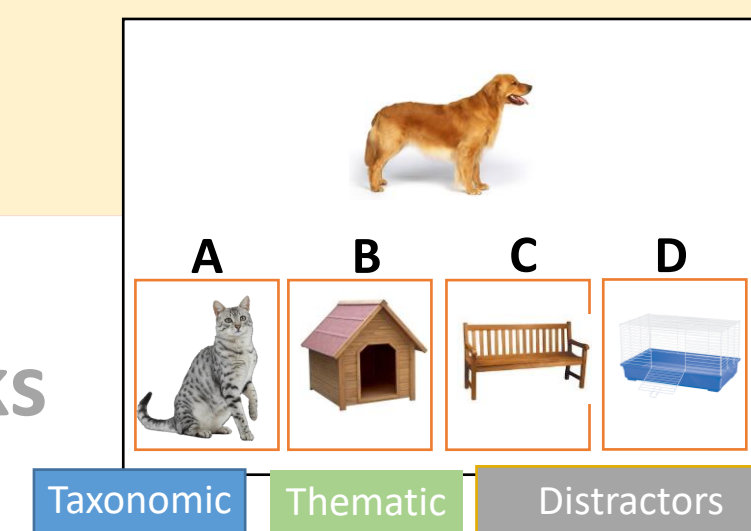
#### Material



Taxonomic and thematic items were equivalent for frequency, familiarity, age of acquisition, imageability and concreteness ( $p < .05$ ). The pictures used were also controlled for visual complexity ( $p < .05$ ).

#### 1. Match-to-sample task

Choose among the 4 pictures, the one that fits best

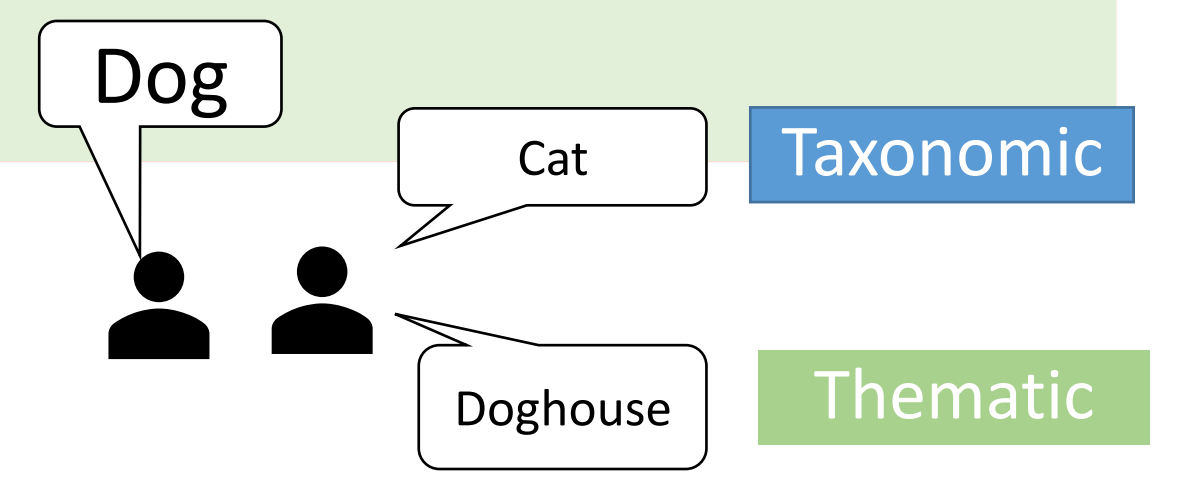


#### 3. Semantic knowledge questionnaire (SKQ)

(only for 9 years old children and adults)  
Answer to taxonomic and thematic questions

#### 2. Lexical fluency task

Say the first 3 words that come to your mind when you hear...

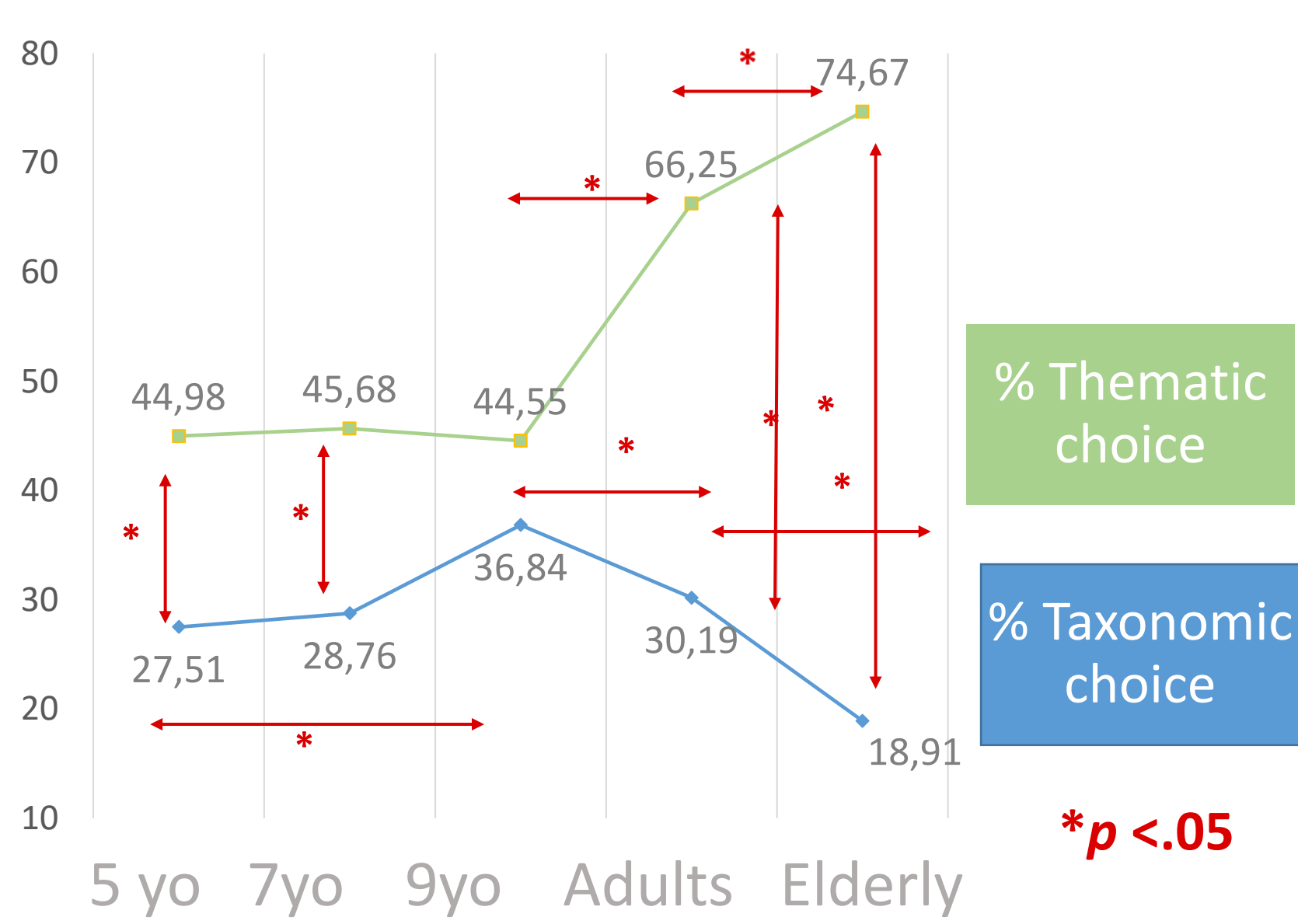


To which common category do a dog and a guinea pig belong?

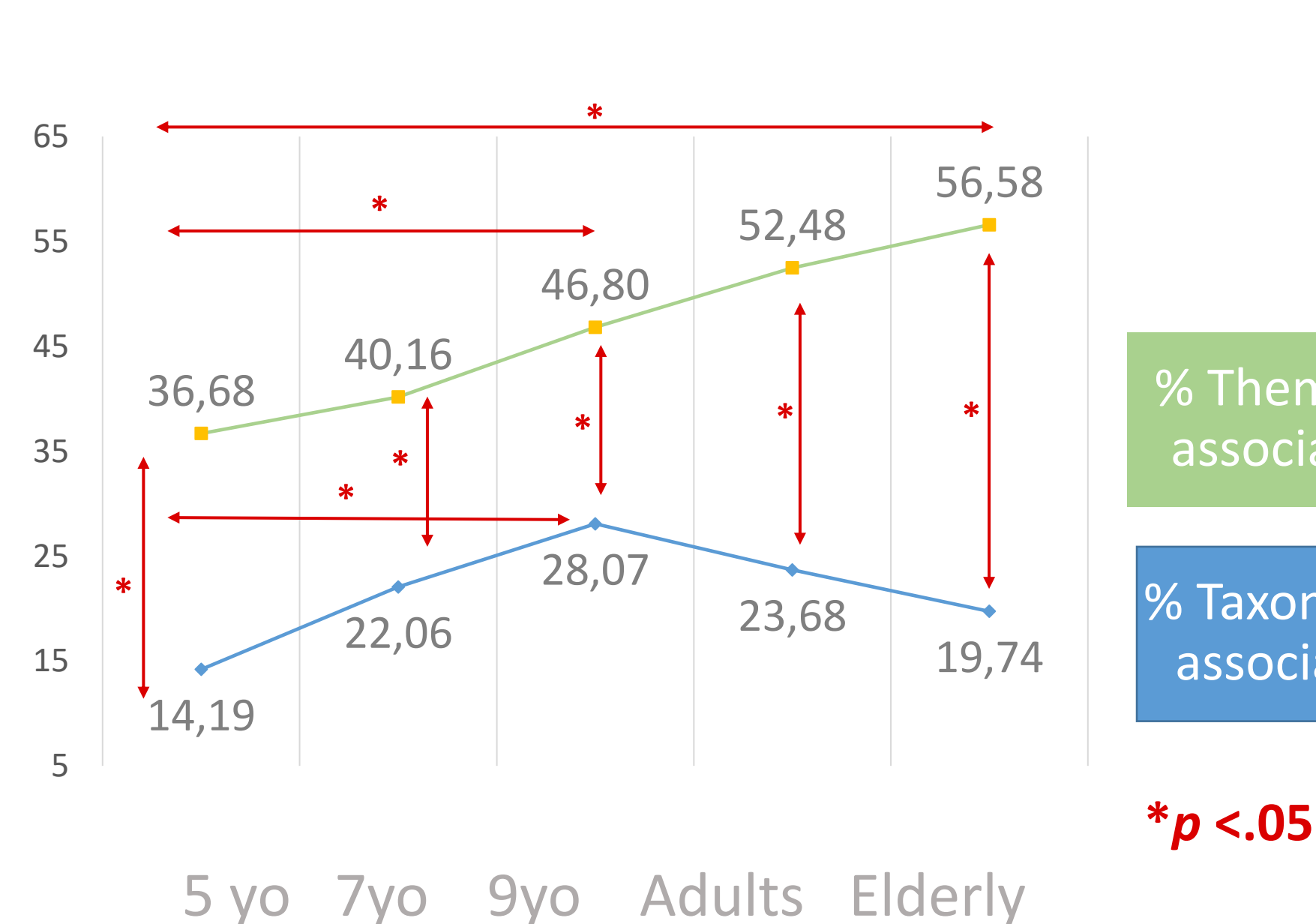
What is the name of the place where the dog sleeps?

**Results** Kruskal-Wallis and Mann-Whitney tests were used to screen inter-groups differences. Wilcoxon tests were computed to check the differences between taxonomic and thematic answers in each group.

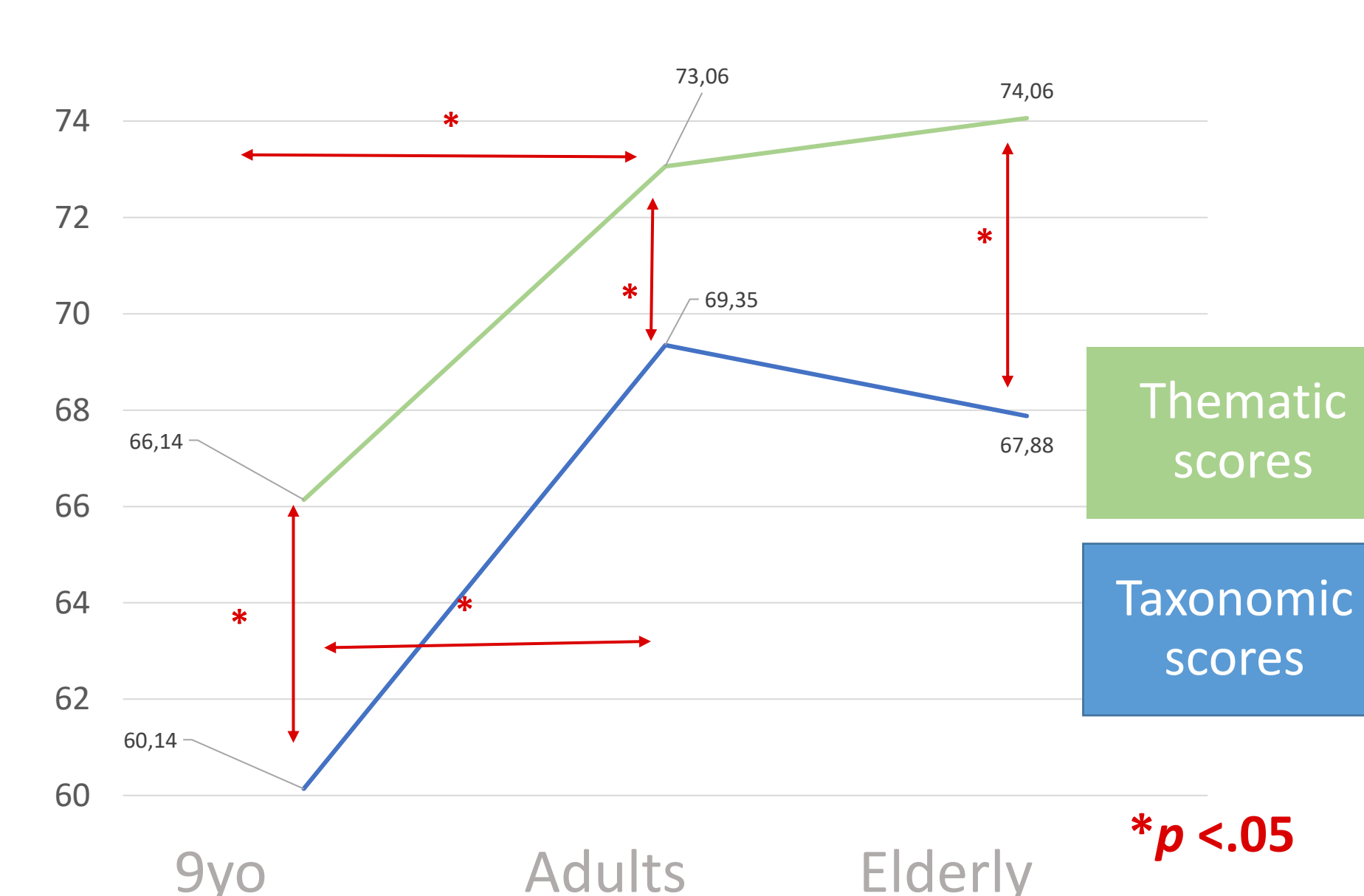
#### 1. Match-to-sample task



#### 2. Lexical fluency task



#### 3. Semantic knowledge questionnaire (SKQ)



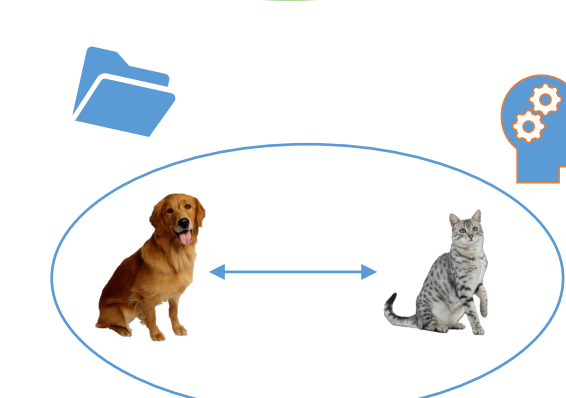
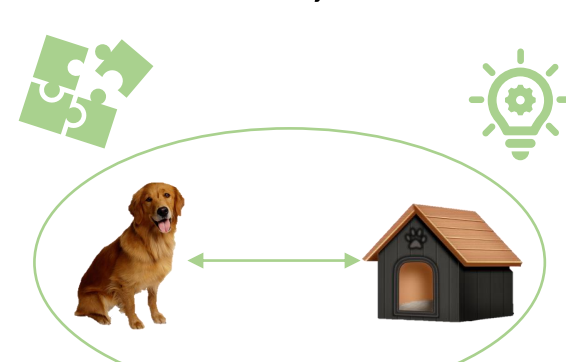
### Discussion and conclusions

Results show the evolution and predominance of the thematic system across the lifespan while taxonomic system only evolves in childhood. However, only at age 9, we observe a balance between taxonomic and thematic choices in the match-to-sample task. We believe that learning of formal knowledge at school at this age would make taxonomic knowledge more readily available, allowing a balance between taxonomic and thematic answers.

Saliency of thematic links across the lifespan for all tasks (excepted for 9 years old children in the match-to-sample task)

Increase of the taxonomic choices between 5 and 9 years old in all the tasks

Preservation of taxonomic and thematic knowledge (SKQ) in elderly but decrease of the taxonomic choices in the match-to-sample task.



Taxonomic Thematic → Complementarity of both systems

Taxonomic and thematic systems are two important but distinct systems in the lexico-semantic network in the lifespan, as demonstrated by separated evolution curves across the age.

Some limits can be pointed : cross-sectional comparisons of the groups can reflect educational, cultural or environmental differences.