**Design for a categorization experiment using mouse tracking**

# Background

The past few decades, there were a lot of changes in theories about categorization, developing to nuanced approaches of fuzzy categories and unique memberships nowadays. Here, we will look at the relation between cognitive processes during categorization and the effectors responsible for manual action to investigate whether graded representations are involved in the real-time taxonomic categorization of names of animals. We will use a mouse tracking design which enables to collect participants’ mouse cursor positions on the computer. We will investigate track the continuous computer mouse trajectories to investigate the manual motor output during lexical categorization of atypical exemplars.

# Hypothesis

The participants’ mouse trajectories gravitate to the alternative (incorrect) category more when presented with an atypical exemplar than when presented with a typical instance.

Category members which are more typical instances are recognized more quickly than atypical exemplars.

Category members which are more typical instances are recognized more accurate than atypical exemplars.

When provided with atypical exemplars, the participants’ mouse movements show evidence of competition between the two categories, noticeable as bias toward the competing category.

# Design

**Materials:** We will use the following atypical and typical animal stimuli in the experiment. In total we have 19 instances, there are six atypical and thirteen typical exemplars. These stimuli will be presented as lexical representations in the bottom center of the screen, written in black color.

In the table below, the competing categories for the animal instance are given in parenthesis, the right category is here written in Italian.

|  |  |
| --- | --- |
| **Atypical** | **Typical** |
| Eel ( *fish*; reptile)  Whale (*mammal*; fish)  Sea lion (*mammal*; fish)  Penguin (*bird*; fish)  Butterfly (*insect*; bird)  Bat (*mammal*; bird) | Hawk (*bird*; reptile)  Dog (*mammal*; insect)  Horse (*mammal*; bird)  Shark ( *fish*; mammal)  Alligator (*reptile*; mammal)  Rabbit (*mammal*; reptile)  Chameleon (*reptile*; insect)  Cat (*mammal*; reptile)  Sparrow (*bird*; mammal)  Goldfish ( *fish*; amphibian)  Salmon ( *fish*; mammal)  Rattlesnake (*reptile*; amphibian)  Lion (*mammal*; fish) |

**Procedure:**

1. Instructions
2. 3 practice trials
3. 19 target trials
4. Post-experiment questionnaire

First, the participants read the written instructions about the task and confirm them by pressing the “Next”-Button. After the instructions, three practice trials follow. At first, the participants are presented with two different animal category names that appear on the two upper left and right corners of the screen, the side is assigned randomly. Then, there will be a 2ms-pause to get familiar with the category names. Now, a button appears at the bottom ("Click here") center of the screen, the participants have to click it and the animal stimulus appears at the same position. The animal stimulus will be a lexical representation of the animal (the atypical animal conditions involve competing categories). The participants have to choose the believed correct category the animal instance belongs to by moving the mouse to the appropriate corner and clicking on the respective animal category name.

After the three practice trials, the target trials begin. They run similar to the practice trials. The order in which the stimuli appear is completely random, this holds for the practice part as well as for the main trials.

After completing the 19 main trials, the participants have the possibility to fulfill a post-experiment questionnaire, but this is not obligatory. The participants can provide information regarding their age, gender and level of education as well as additional comments to make analysis easier for the scientists.