

# KOGW-PM-KNP:

## Tutorial 2 - Güntürkün's Magpies

1. What was the research question the authors wanted to address? [1]

Any 1 from below:

- Do magpies have self-awareness?
- Does a sense of self, characterised by social intelligence, follow convergent evolution?
- Is a laminated cortex a prerequisite for self-recognition?

2. What experimental hypothesis did they formulate in order to test their research questions? Try to express this hypothesis in “IF ..., then ...” form. [2]

- IF magpies exhibit self-directed behaviour, i.e. attempt to remove the mark from their bodies,
- THEN they exhibit self-recognition.

3. Identify the independent and dependent variables in the experiment. [5]

Independent (any 3)

- Identity of birds (Gerti, Goldie, etc.)
- Color of marks
- Presence of mirror
- Size of cage cell (1 or 2 compartments)

Dependent

- Contingency behaviour (self-recognition) vs conspecific behaviour (aggressive, social, etc.)
- Quantity of self directed behaviour (behavioural activity directed towards the marked region)

4. What type of realizations/operationalizations did the authors use to observe the dependent variable? [4]

Any 4:

- Measure time spent in mirrored vs unmirrored compartments.
- Number of close inspections of the mirror.
- Looks behind the mirror.
- Contingent vs Social behaviour.
- Frequency of spontaneous self-directed (mark-directed) behaviour

5. What variables did the authors identify as potentially confounding factors and how did they control for them? [2]

Any 2:

- Exhibit self-directed behaviour without a mirror -  $\hat{A}_i$  introduce a non-reflective sheet in place of the mirror in control trials
- Exhibit self-directed behaviour without seeing the mark -  $\hat{A}_i$  introduce a black (sham) mark
- Operant conditioning - use small number of trials so the birds don't become conditioned to the experimental setup and produce biased results.
- Handling - bird's eyes are shielded from seeing the mark being applied to their bodies.
- Influenced by colour of mark - introduce 3 different colours as well as sham.
- General increase in behavioural activity may result in more instances of apparent self-directed behaviour - measure quantity of behavioural activity in various trials.

6. What other potential confounds could you think of that the authors did not control and that could potentially invalidate their research? [2]

Any 2:

- Social upbringing of the birds (Hand raised vs Wild ("natural social conditioning")).
- Experimenters subjective rulings of displayed behaviours.
- Validation through comparison to other study that could potentially be flawed (a.k.a. Ape studies)
- Too small sample size to be definitive for a population
- Mark could be within magpies visual field.

7. Label the design as within- or between group design. [2]

Within-group design

8. Create an example design matrix, for one subject, that is, a matrix containing one row for each trial of the experiment, and one column each for the independent variable, the control variables and the trial number. [2]

TBC.

Please email me your answers (marianne.maertens@tu-berlin.de), together with a text file containing your design matrix including column names. Don't forget to include the names of both partners.

Maximum marks 20/20