

# KOGW-PM-KNP: Tutorial 2 - Güntürkün's Magpies

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Working in a pairs, read the paper by Prior, Schwarz and Güntürkün (2008) and answer the following questions:

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.