

# Female and male pigs' performance in a judgement bias task

Sanne Roelofs<sup>1</sup> | Rebecca Nordquist<sup>1,2</sup> | Franz Josef van der Staay<sup>1,2</sup>

1. Utrecht University, Faculty of Veterinary Medicine, Department of Farm Animal Health, Emotion & Cognition Group

2. Utrecht University, Brain Center Rudolf Magnus

## Introduction

Judgement bias tasks have been recommended as potential instruments for farm animal welfare assessment<sup>1</sup>. Such tasks test the influence of affective state on subsequent judgement of ambiguous stimuli, e.g. a positive affective state will produce an optimistic judgement bias. Judgement bias tasks have previously been applied to pigs, producing mixed results<sup>2</sup>. Also, while both female and male pigs have been used as study subjects, a possible sex effect has never been systematically addressed.

## Objectives

- To compare baseline judgement bias of female and male pigs
- To examine the suitability of the judgement bias task as a welfare indicator

## Methods

Ten female and ten male pigs were socially housed in an enriched environment. An active choice task was used to measure judgement bias, using tones of different frequencies as conditioned and ambiguous stimuli (Fig. 1 & 2).

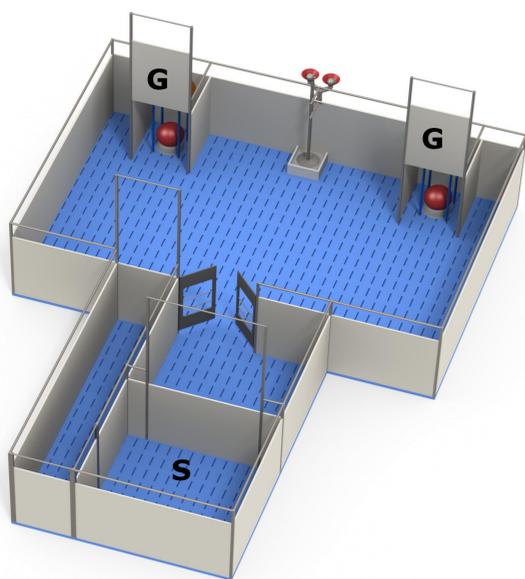


Figure 1 Judgement bias task apparatus with start box (S) and goal boxes (G).

## Results

A comparable number of trials were required to train female and male pigs (Mean ± SD: females 22.33 ± 6.16; males 22.11 ± 5.99).

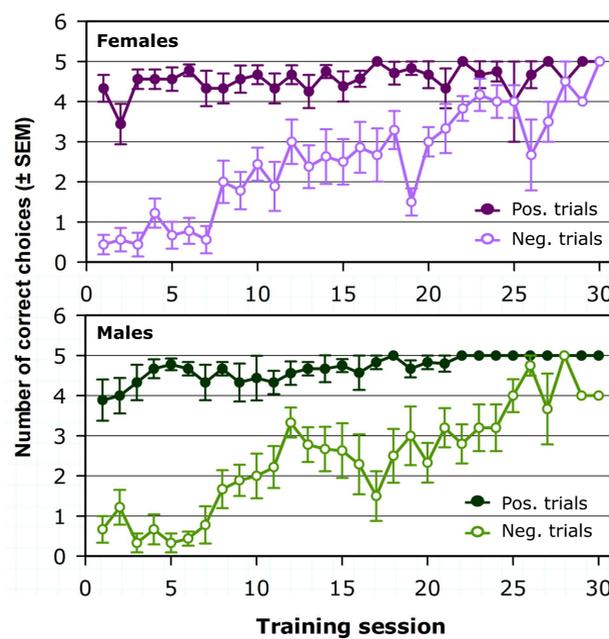


Figure 3 Mean number of correct goal-box choices per training session for positive and negative trials

During testing, no sex effect was found for optimistic choice percentages per tone-cue.

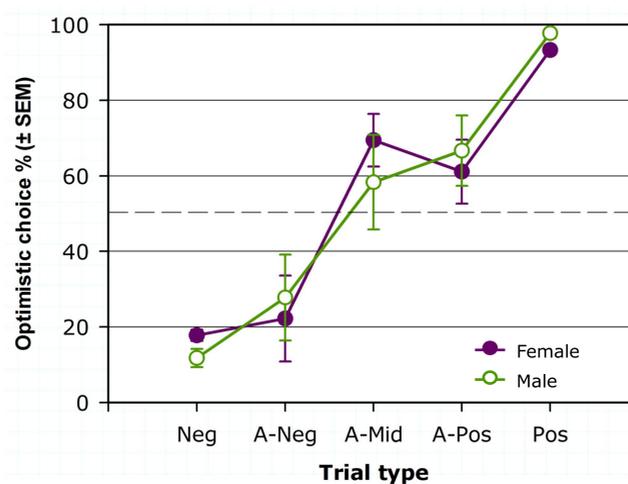


Figure 4 Mean percentages of optimistic choices in response to negative (Neg), near-negative ambiguous (A-Neg), intermediate ambiguous (A-Mid), near-positive ambiguous (A-Pos) and positive (Pos) tone-cues

Both females and males show a decrease in optimistic choice AUC as testing progressed.

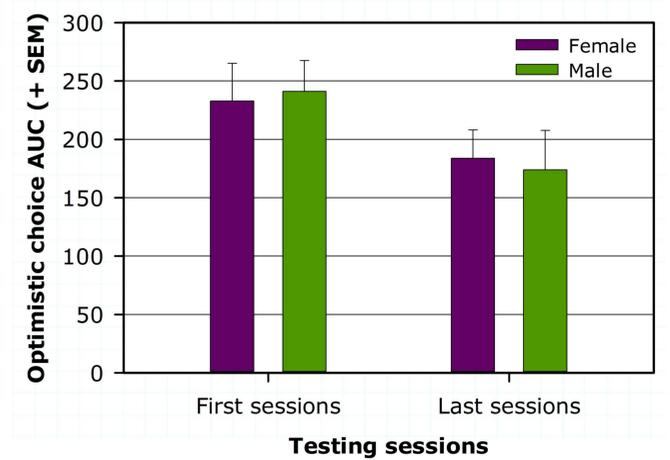


Figure 5 Optimistic choice AUC for first and last test sessions.

## Conclusions

Both females and males displayed a comparable baseline judgement bias, indicating either sex can be used in judgement bias tasks. However, a comparison of judgement bias in pigs with an assumed negative affective state would be valuable to further validate this result.

Several findings indicate further improvement of the judgement bias task as a welfare indicator for pigs remains necessary:

- Judgement bias tasks require an extensive training period before testing is possible.
- In spite of (social) enrichment, both female and male pigs showed only a slightly optimistic judgement bias.
- Pigs decreased their optimistic responses as testing progressed, indicating they learned that the ambiguous cues did not signal a rewarded outcome.

## References

<sup>1</sup> Baciadonna, L. & McElligott, A.G., 2015. The use of judgement bias to assess welfare in farm livestock. *Anim Welfare*, 24, pp. 81-91.

<sup>2</sup> Murphy, E., Nordquist, R.E., van der Staay, F. J., 2014. A review of behavioural methods to study emotion and mood in pigs, *Sus scrofa*. *Appl Anim Behav Sci*, 159, pp. 9-28.

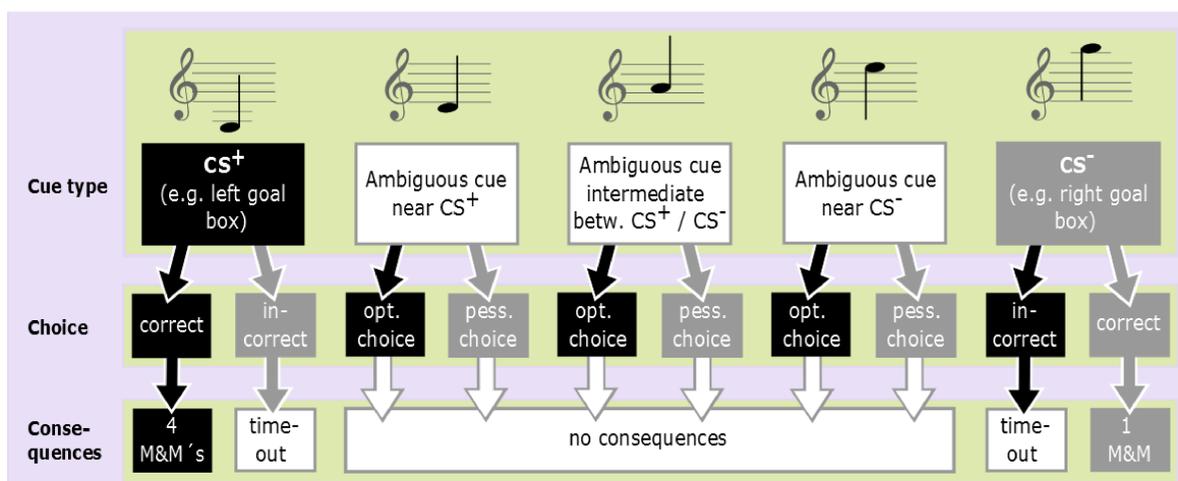


Figure 2 Schematic overview of judgement bias task. Pigs were trained to associate two different tone-cues with positive (large reward) or negative (small reward) consequences. During testing, responses to intermediate tone-cues were scored.