1. ABOUT THE DATASET

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Title: Rodent behavioural data and Matlab codes for repeated textured Novel Object Recognition tests (tNORTs)

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Rights-holders: Yurie Hayashi, University of Reading

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Description: This study designed repeated tNORTs to investigate whisker sensitivity of rodents. It consisted of 2 sets of tests. (1) Object shape bias tests (OSBTs). (2) tNORTs. Eight rats were used throughout the study.

The OSBTs were conducted in 8 days (Test day1 ~ day8) using 8 different objects (Object I ~ Object VIII). Each test involved 2 objects of the same shape placed in an arena (positioned at Left and Right).

After OSBTs, rats performed five tNORTs (Test 1 ~ Test 5), with different grit-size sandpapers used for each test. The stopping criterion was when rats failed to discriminate different textures in two tests with finer grit sizes. Each tNORT consisted of a sample phase with two objects (L and R) covered by the same sandpaper, and a test phase with two objects covered by the same sandpaper (F) and a novel sandpaper (N).

The behaviour of the rat was recorded via a video camera for all tests. The video was analysed using ‘The Observer XT’ from Noldus to find rat exploration times (in seconds) of the Left and the Right objects, or the Familiar and Novel objects.

The two data sets were analysed using two pieces of Matlab code (Matlab R2023b): Code\_ObjBiasAnalysis\_v1.m and Code\_tNORT\_Analysis\_v1.m respectively. All figures used in the paper can be drawn by running the Matlab files.

Cite as:

Hayashi, Y. and Zheng, Y. (2024): Rodent behavioural data and Matlab codes for repeated textured Novel Object Recognition tests (tNORTs). University of Reading. Dataset: http://dx.doi.org/10.17864/1947.000538

Related publication:

Hayashi, Y., Alamir, N., Sun, G., Tamagnini, F., Hayashi, Y., Williams, C. and Zheng, Y. (2024) **An effective textured Novel Object Recognition Test (tNORT) for repeated measure of whisker sensitivity of rodents***.* Behavioural Brain Research, 472. 115153. DOI: https://doi.org/10.1016/j.bbr.2024.115153

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2. TERMS OF USE

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This dataset is © Yurie Hayashi and University of Reading.

Matlab code files are © University of Reading except code for function RMAOV1.m, which is © Antonio Trujillo-Ortiz.

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RMAOV1.m code is © Antonio Trujillo-Ortiz.

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Cite as: Antonio Trujillo-Ortiz (2024). RMAOV1 (https://www.mathworks.com/matlabcentral/fileexchange/5576-rmaov1), MATLAB Central File Exchange.

3. PROJECT AND FUNDING INFORMATION

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Research grant:

Title: **Understanding neural excitation and inhibition: implications for the interpretation of extracellular field potentials and neurovascular coupling**

Dates: 1 January 2013 – 31 June 2016

Funding organisation: BBSRC

Grant no.: BB/K010123/1, BB/K010123/2

University of Reading regional PhD bursaries for PhD fees for Yurie Hayashi on the PhD project ‘A preclinical model of the effect of dietary supplementation of vitamin B12 on cognition and neural activity’.

Dates: Jan 2019 – Dec 2022.

4. CONTENTS

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File listing:

Data\_ObjBiasTest.xlsx,

Data\_tNORTs.xlsx

Code\_ObjBiasAnalysis\_v1.m

Code\_tNORT\_Analysis\_v1.m

SamplePhaseVideo1.mp4

TestPhaseVideo1.mp4

5. METHODS

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Description: The data in the MS Excel files Data\_ObjBiasTest.xlsx and Data\_tNORTs.xlsx were collected from two sets of behavioural tests of rats:

(1) Object Shape bias tests

(2) textured Novel Object Recognition Tasks (tNORTs)

All tests were performed on the same eight rats.

Object shape bias tests: These were conducted on eight rats (column A) using eight object shapes from shape I to shape VIII (row 3). There were eight test days as indicated by columns titled ‘Test day#’ in Data\_ObjBiasTest.xlsx. The number in each cell is the amount of time in seconds the rat spent exploring the specified object.

tNORTs: These were conducted on the same eight rats as above and the data was stored in the file Data\_tNORTs.xlsx. There were 5 tests, all involving a sample phase with a left (L) and a right (R) object, and a test phase with a familiar (F) and a novel (N) object. Texture of the sandpaper for the novel object and the position of the novel object were in columns titled ‘N texture’ and ‘N pos’ respectively. The number in each cell is the amount of time in seconds the rat spent exploring the specified object.

All tests involved the use of an open field arena and a camera. Details of the experimental procedure are provided in the paper.

To analyse data in Data\_ObjBiasTest.xlsx, type in Matlab:

>> Code\_ObjBiasAnalysis\_v1

To analyse data in Data\_tNORTs.xlsx, type in Matlab:

>> Code\_tNORT\_Analysis\_v1

Video files: The two video files are from a tNORT experiment in the sample and test phases respectively. It was selected at random.