

My PhD journey: why blinding and standing up for reproducibility matter



Dr Fiona Ramage

CAMARADES

(Centre for Clinical Brain Sciences, College of
Medicine and Veterinary Medicine)

PhD project: how do (short-term) high-fat diets impact cognition in mice?



Ketogenic diet



High-fat diet



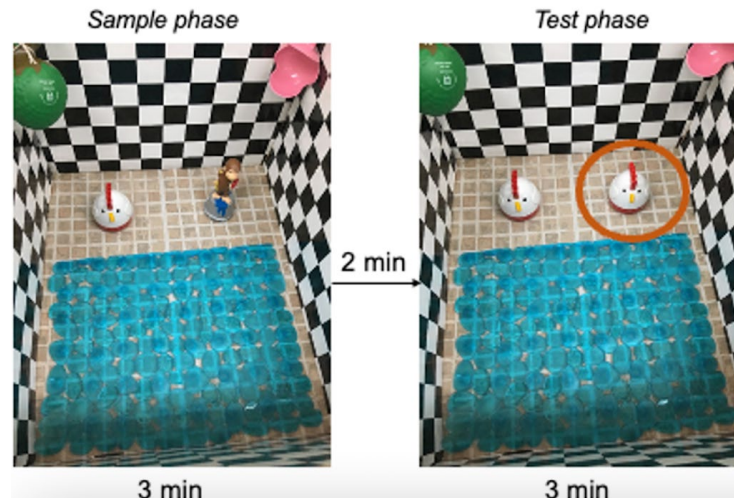
Low-fat diet



Standard chow

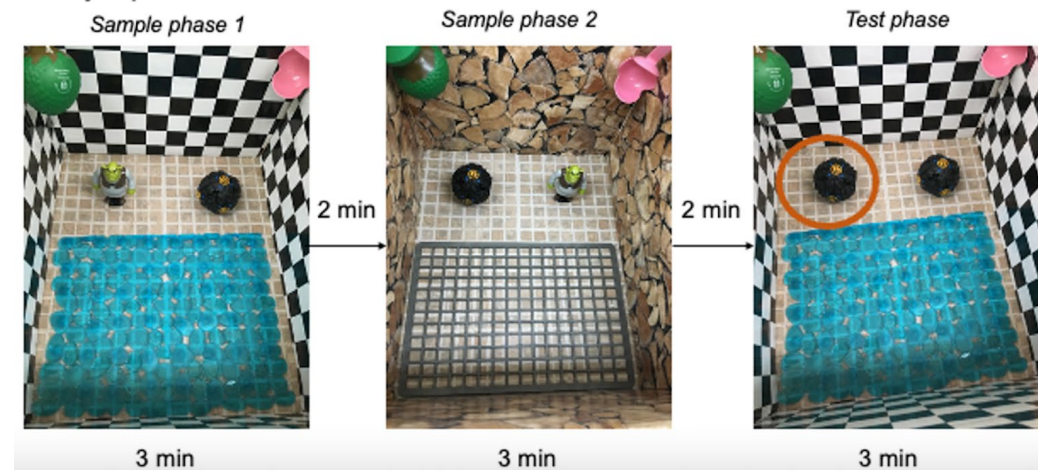
Place memory

B. Object-place task



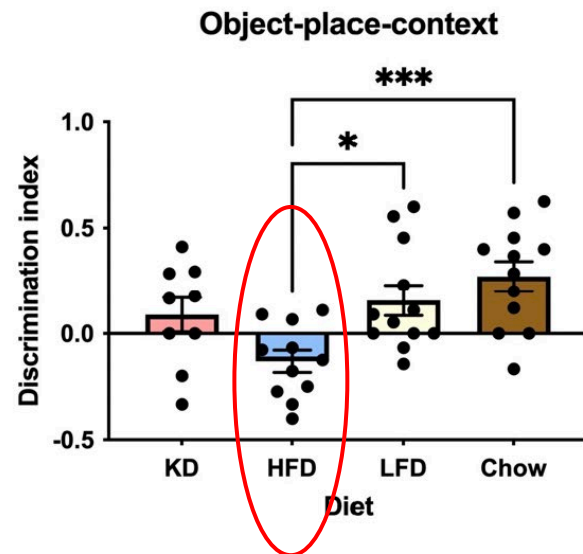
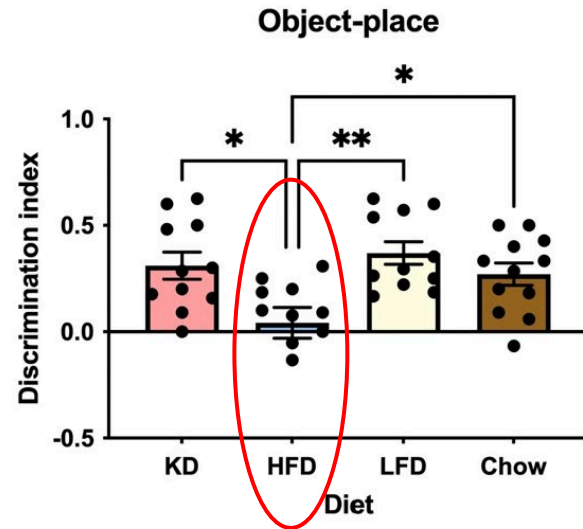
Episodic-like memory

D. Object-place-context task

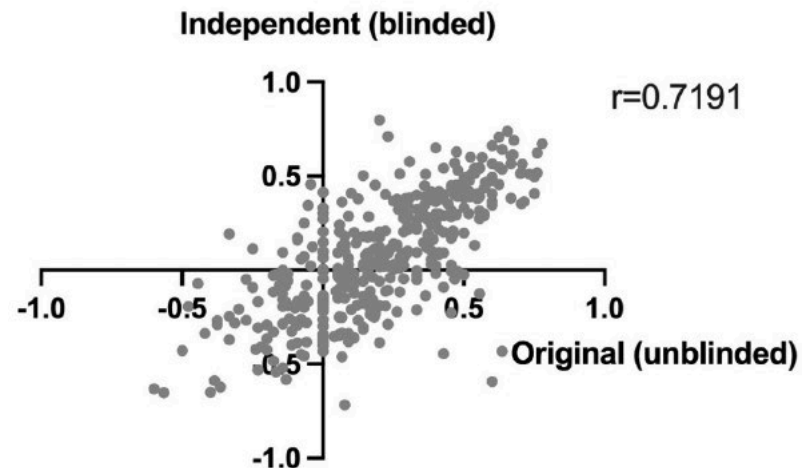


Results: 4-5 days of HFD impairs memory

...or does it?

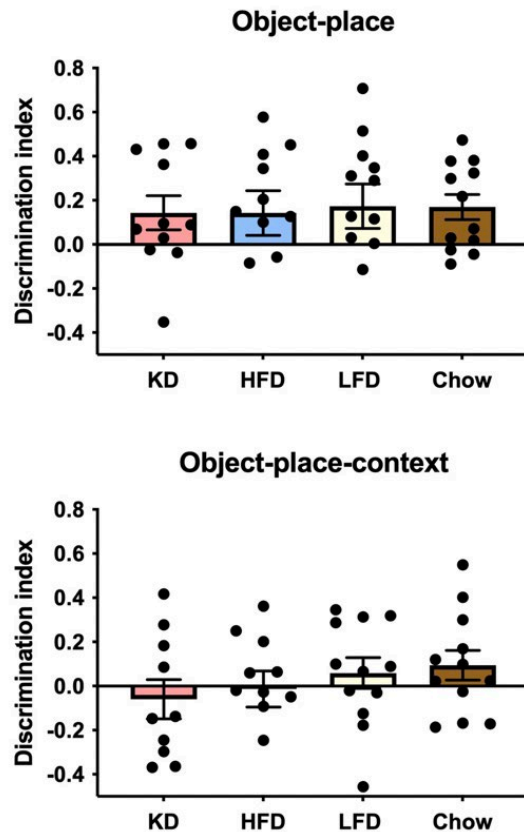


- Outcome assessment not blinded to mouse/diet group identity
 - Subjective behaviour tasks (what counts as exploration?)
- Need validation of results

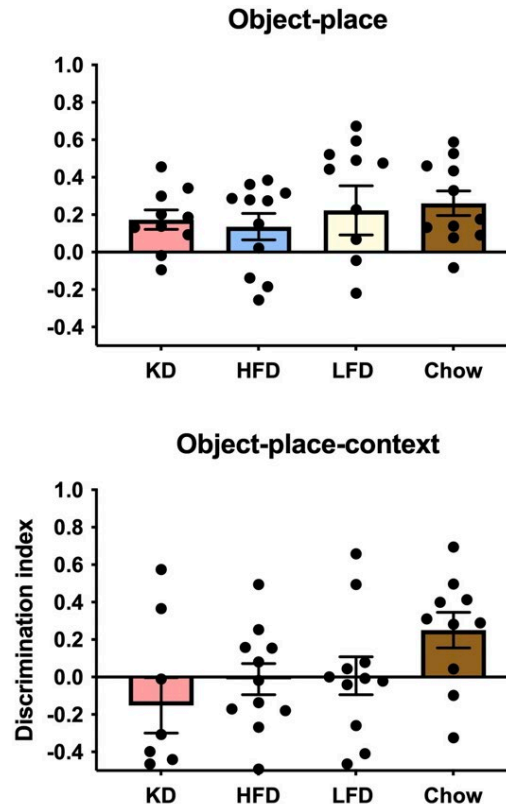


Digging deeper...

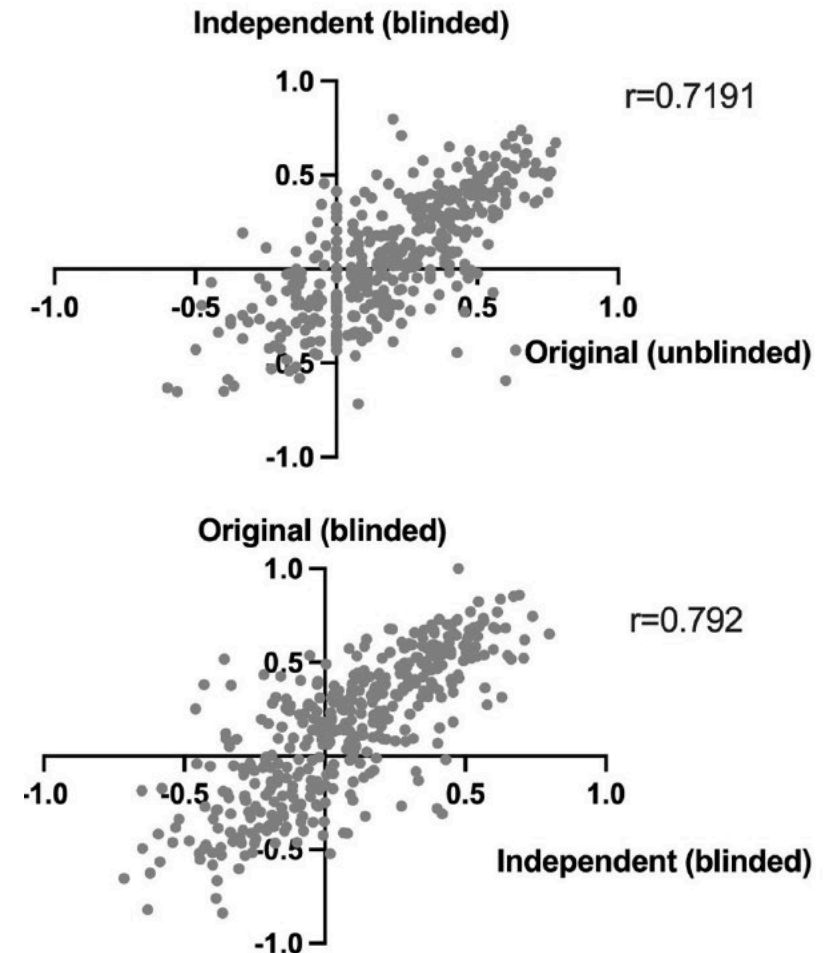
1. Plot behaviour by blinded independent observer



2. Rescore blinded by original observer (me)



3. Correlations



The outcome

- Unable to replicate previous results
 - But...previous results were also unblinded
 - Blinded outcome assessment reported in $\leq 30\%$ of nutritional neuroscience literature
 - Object recognition tests are very subjective
- Major problem in neuroscience literature?

Option 1a: Continue
with “validated”
unblinded results

Option 1b: Repeat
experiment until we get
the results we want

Option 2: ????

Next steps?

Summarise nutritional neuroscience literature?

- Effects of diet on cognition under heterogeneous conditions
- Effects of measures such as blinding on results
- Quantify prevalence of blinding and other issues...

The problem...

“There is an issue with my PhD research”

- Cool project to explore
- Publishable findings
- Impact on field
- Promote good practice

“There is an issue with previous work from the group”

“There is an issue with the whole field and all the work in it”

+ not doing what I originally set out to do/was funded to do...

Consequences

- Ill health → temporary break needed from intense lab work
- Combined with overall direction of PhD...



Termination of studies

- Advised not to write up blinding results for Mres
- 6 months unpaid leave before formal termination

Stubbornness...

Resolution

- Unpaid sick leave
- Guidance on pre

Professor Malcolm Macleod FRSE

Professor of Neurology and Translational Neuroscience, University of Edinburgh

Malcolm Macleod is Professor of Neurology and Translational Neurosciences at the University of Edinburgh; Honorary Consultant Neurologist at NHS Forth Valley; and a former Rector of Edinburgh University. His current research focusses on addressing the gap between promising laboratory findings and their real work exploitation, understanding the reasons for failed translation and testing interventions to improve research processes and their implementation. He is currently co-director of Edinburgh Neuroscience, committed to cultivating a research culture where every researcher can realise their maximum potential.



BNA Credibility Prize winners

Fiona Ramage

Student Researcher Credibility Prize winner

Fiona is a PhD neuroscience student at the University of Dundee, studying the short-term memory impairments caused by a high-fat diet, and the mechanisms

work in her issues with wellbeing. She and turned i credibility in

Fiona now c cognition, te process edu research. He Open Scienc raising the is journal club.

Effect of lack of blinding on outcome assessment in rodent object recognition tasks

Registration OSF Preregistration

template:

Registry: OSF Registries

Registered: Thu Mar 10 2022 15:39:19 GMT+0000

Last updated: Thu Mar 10 2022 15:30:12 GMT+0000

Contributors: Ramage, Martin, McCann, and 4 more

Description: Background: Blinding of the outcome assessor in experimental research...

[View](#)

[Update](#)

Work on reproducibility

Postdoc with CAMARADES

Open resources



Data



Analytic code



Materials



Papers



Supplements



Take-home messages

1. Reproducibility matters

- Why are we doing research in the first place?
- What happens if it's not reproducible?

2. Stand up for science/good practice

...though not necessarily in the way I did(!)

Acknowledgements



University
of Dundee

Dr Ros Langston

Prof Lynda Williams
(University of Aberdeen)

Alex Polanski

Animal unit staff @ UoD

Prof David Martin



THE UNIVERSITY
of EDINBURGH

CAMARADES team

In particular:

Prof Malcolm Macleod

Dr Kaitlyn Hair

Emma Wilson

Dr Gillian Currie



eastbio
the East of Scotland Bioscience Doctoral Training Partnership



BBSRC Doctoral
Training Partnerships



Collaborative Approach to Meta Analysis and

•C•A•M•A•R•A•D•E•S•

Review of Animal Data from Experimental Studies