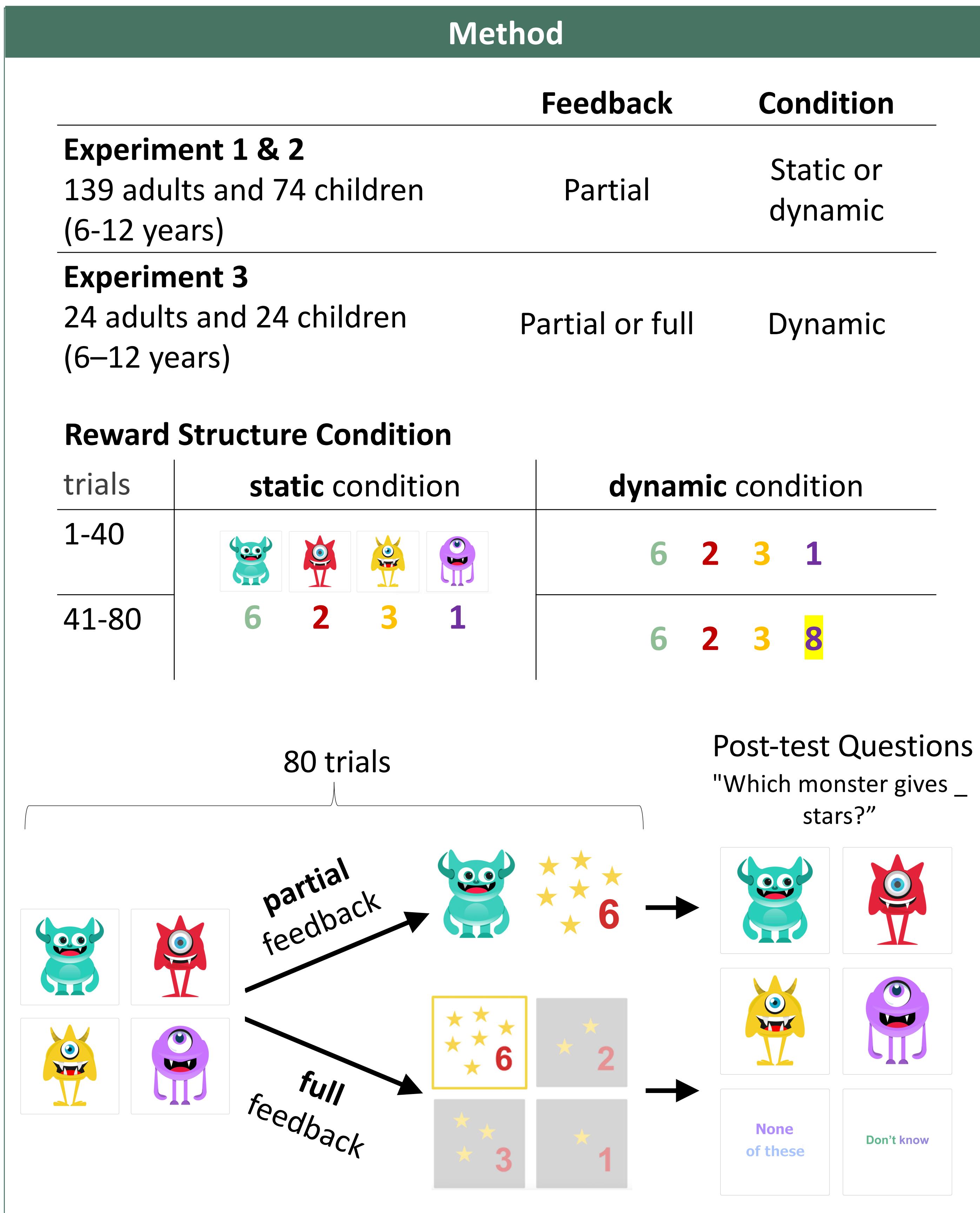


Expecting the unexpected: Children's over-exploration facilitates adaptation to a changing world

Amy X. Li¹, Emily Sumner², Brett K. Hayes¹, Amy Perfors³, Barbara W. Sarnecka², & Danielle J. Navarro¹

¹University of New South Wales, Sydney, ²University of California, Irvine, ³University of Melbourne

- Children exhibit a tendency to persistently explore suboptimal options, rather than exploit optimal options.
 - This 'over-exploration', although seemingly unnecessary, is systematic and non-random (e.g., Blanco & Sloutsky, 2019; Schulz, Wu, Ruggeri, & Meder, 2019).
- So why do children over-explore?
1) When could it be adaptive? 2) What might it be driven by?

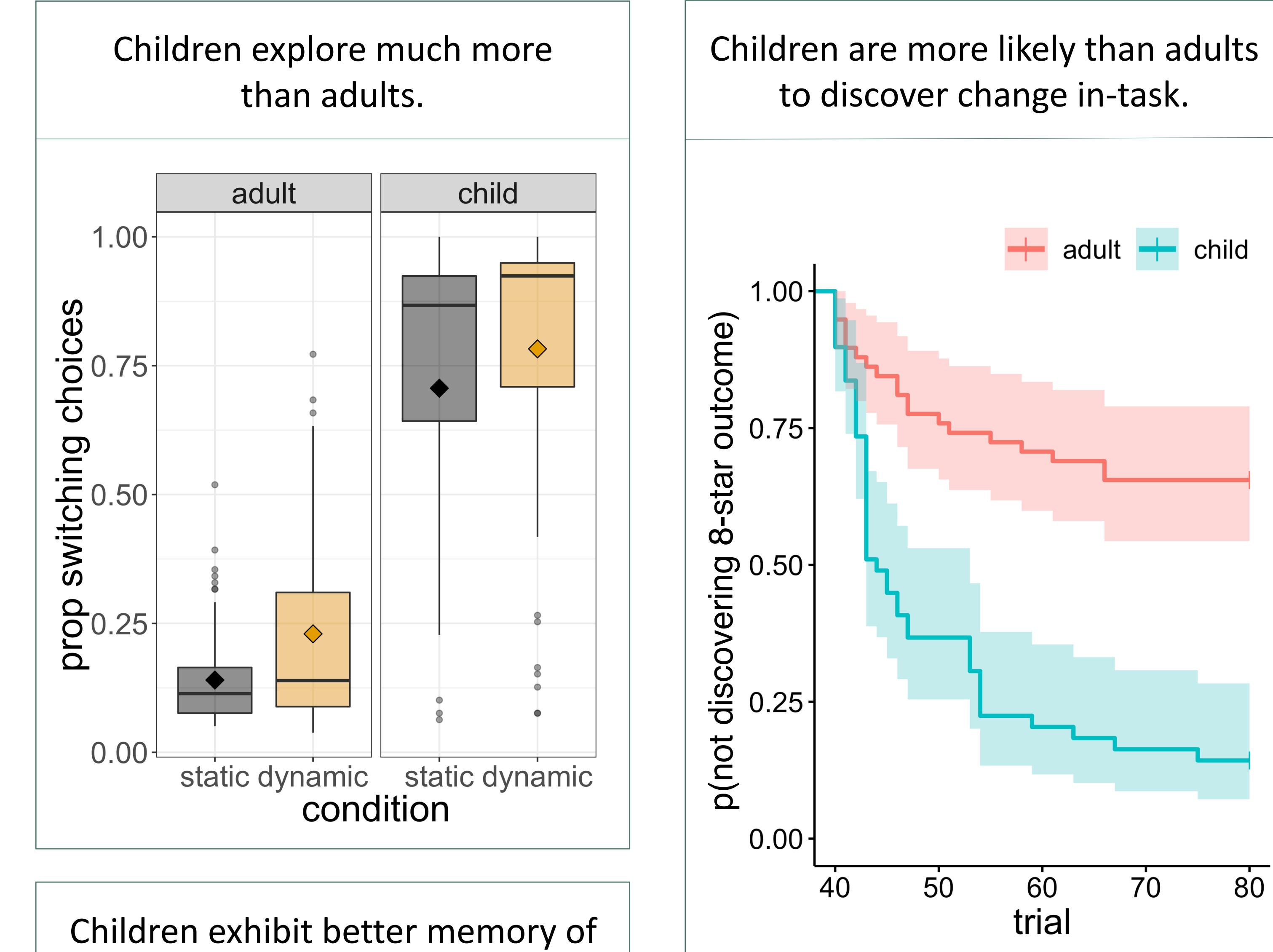


Acknowledgements

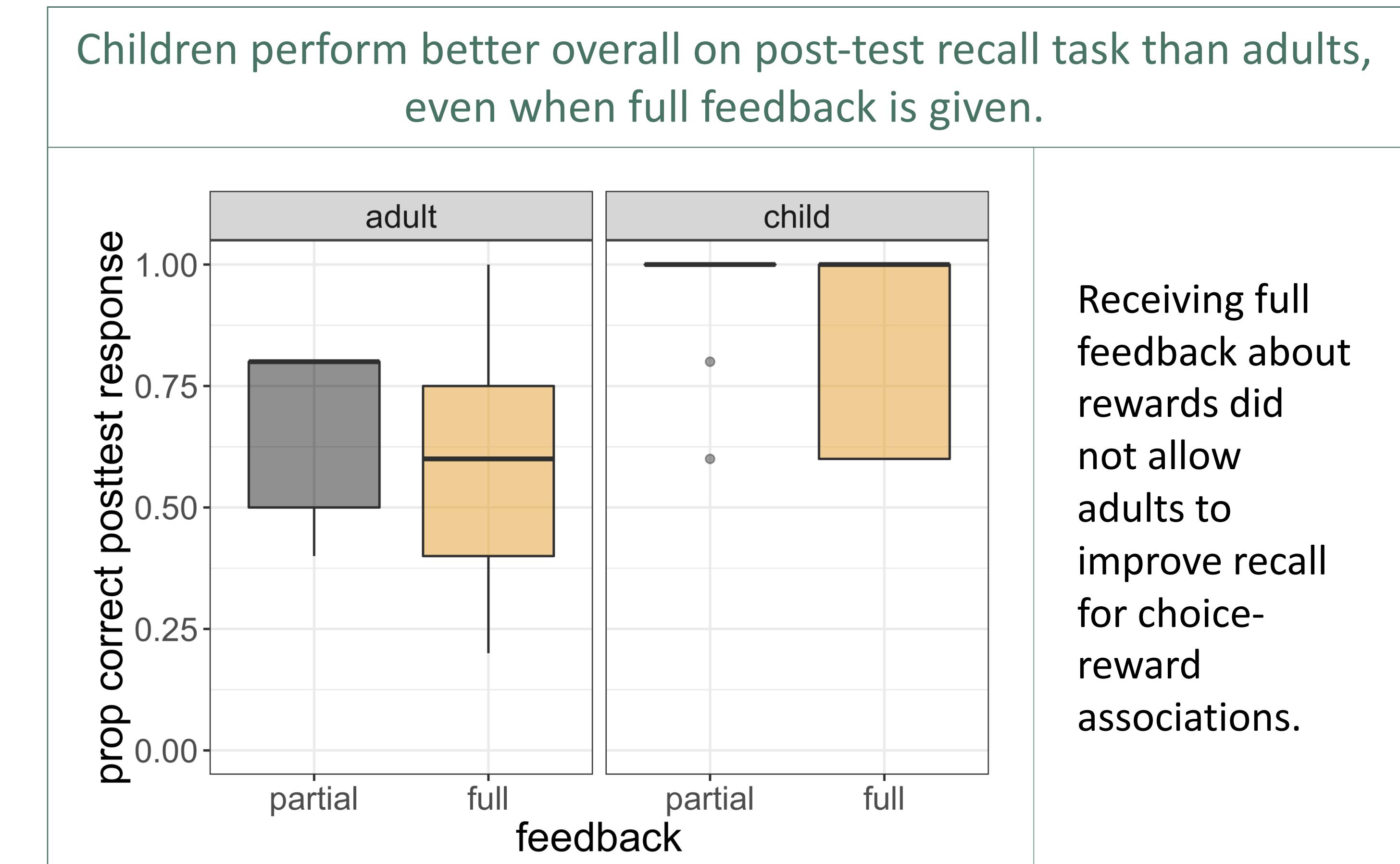
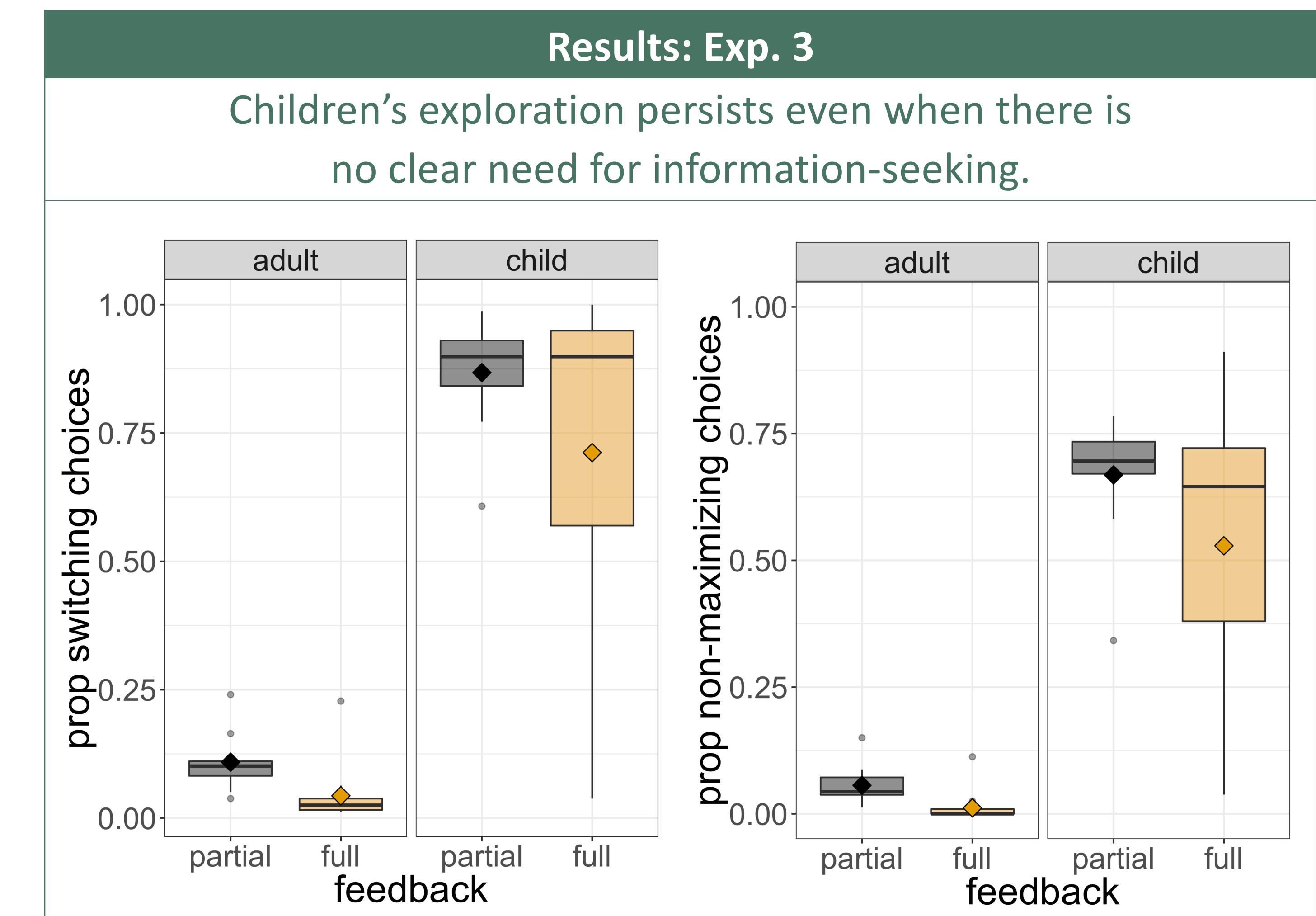
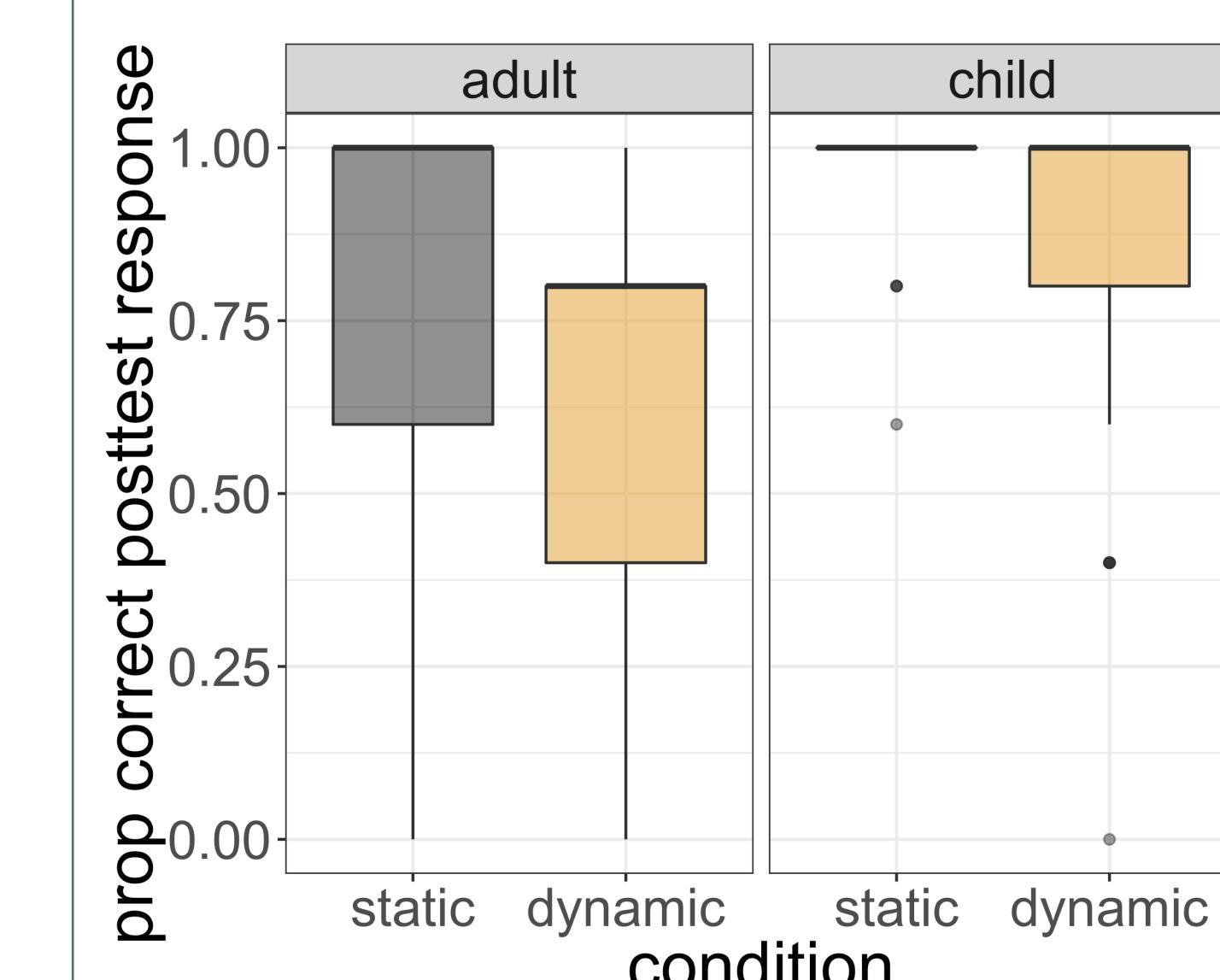
- We thank little scientists from Discovery Cube Orange County, and TASK Camdenville, Sydney, for making this work possible.
- AX Li thanks the School of Psychology, UNSW Sydney for providing support to present this work, and UNSW ResTech and the UNSW Cognition Group for ongoing feedback and assistance.

Children's over-exploration is advantageous in a changing environment, and persists even when there is no apparent need for information-seeking.

Results: Exp. 1 & 2
Over-exploration helps children discover changes that adults miss when the environment is dynamic.



Children exhibit better memory of reward outcomes associated with choice options (monsters) than adults.



Summary

- Children's over-exploration:
 - Enables them to better discover change in a dynamic environment than adults.
 - May not be solely driven by a need for information or memory limitations.
 - Receiving full feedback did not allow adults to outperform children in memory of choice-reward associations, and overall resulted in a performance decrement for both adults and children.
- Memory advantage for active learning vs. passive instruction?

