

## Experiment Debrief

Thank you for your participation in this experiment. This experiment exposed you to simple line-drawings of real-world objects, such as animals, and asked you to make judgments about those objects, such as the size of those objects. You were asked to selectively respond to certain stimuli but not others. For example, you may have been asked to identify the size of all animals presented, or the size of mammals only.

We were interested in how difficult the task is (as measured by your accuracy and response time) based on different variations of which stimuli you were asked to respond to. We hypothesized that certain sets of objects may be easier to respond to than other sets. For example, consider a set of objects broken into 4 sub-sets: small animals, big animals, small instruments, and big instruments. We hypothesized that respond to “small animals and big animals” would be an easy condition, whereas responding to “small animals and big instruments” would be a harder condition. This condition corresponds to what’s known as an “exclusive-or”; completing the task requires your brain to combine two categories (animals and instruments) that are usually treated as separately. Scientists have recently demonstrated that learning this kind of task can be difficult (Bustamante, et al., 2021), so your brain uses short-cuts to make the problem a bit easier. We were interested in testing if these short-cuts also get applied in more natural settings, such as making decisions about animals and instruments (McClelland and Rogers, 2003). By participating in this research project, you have helped advance our understanding of how the brain manages complex cognitive tasks in real-world settings, with the hope of applying this understanding to help aid people with neurological and/or psychiatric conditions whose brains cannot manage these sorts of tasks naturally.

To learn more about this research, visit our website at <https://ncclab.princeton.edu> or contact the researchers at [tylerg@princeton.edu](mailto:tylerg@princeton.edu).

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## References

- Bustamante, L., Lieder, F., Musslick, S. et al. Learning to Overexert Cognitive Control in a Stroop Task. *Cogn Affect Behav Neurosci* 21, 453–471 (2021). <https://doi.org/10.3758/s13415-020-00845-x>
- McClelland, J., Rogers, T. The parallel distributed processing approach to semantic cognition. *Nat Rev Neurosci* 4, 310–322 (2003). <https://doi.org/10.1038/nrn1076>

Please keep this sheet in case you have any questions about this research project.

1. TITLE OF RESEARCH: The Intrinsic Cost of Cognitive Control: Neural Foundations and Implications for Decision Making
2. For answers to any questions you may have about this research, contact:  
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3. For answers to any questions you may have about your rights as a research subject, contact:  
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4. If you feel bothered or distressed by any of the questions you were asked, please call 1- 800-273-8255 or another free, confidential, anonymous hotline. Additionally, if you are a student, urgent walk-in appointments are available on the 3<sup>rd</sup> floor of McCosh Health Center at Counseling and Psychological Services during regular business hours.