

Beat the Bots: Exploring the Effects of Placebo Manipulation on Performance During Video Gameplay

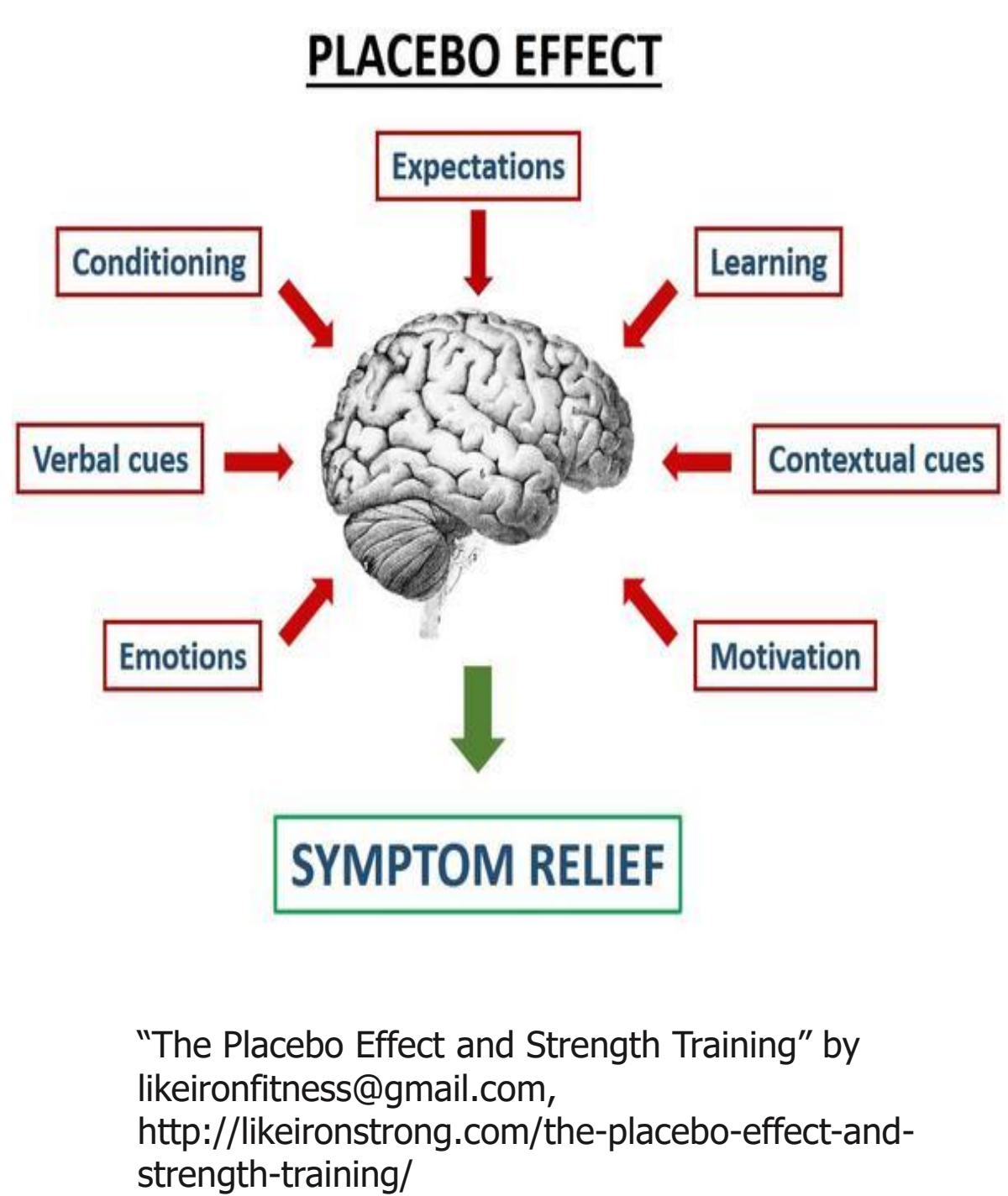
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Introduction

Placebos

- Placebos are **inert** ergogenic aids that elicit performance increases or symptom relief above a control.^{1,2}
- Expectation** of events and environmental **contextual cues** are hypothesized mechanisms of action.^{1,2}
- Expectancy effects may or may not increase cognitive performance.^{3,4}



Video Games

- Real-time strategy games may serve cognitive science as a manipulatable task environments by offering:⁵
- Dynamic task environment
 - Motivated participants
 - Accurate measures of motor performance and attention allocation
 - Noninvasive measure of performance
 - Large datasets
 - Numerous variables
 - Large range of expertise

Hypothesis

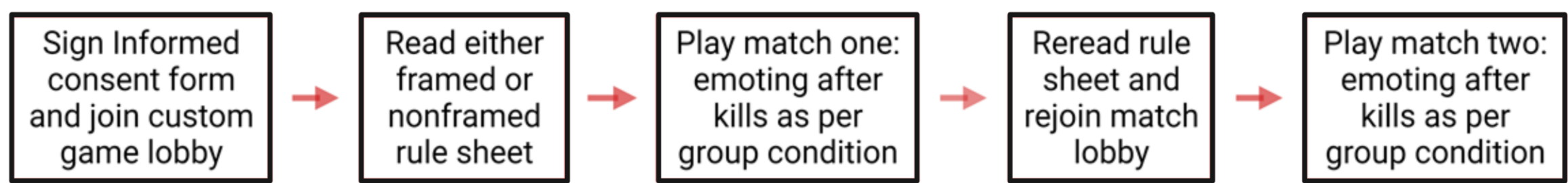
The expectation of increased performance introduced via an instructional contextual cue will lead to disparate performance outcomes between control vs. placebo groups.

Methods

Participants

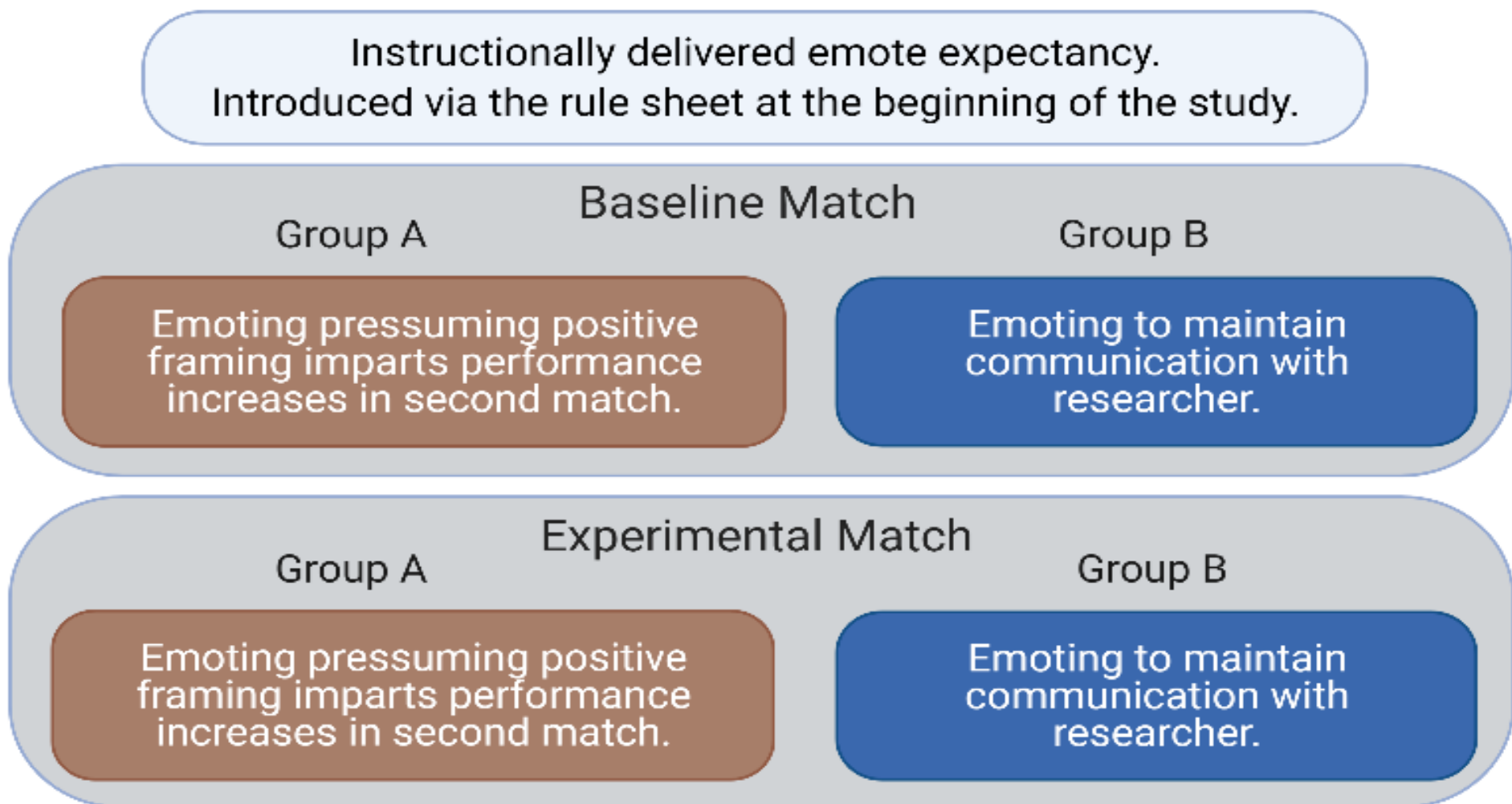
- Forty-one gold-platinum players with over 30,000 mastery points were recruited (37 males, 4 females). Matches were excluded if players did not follow instructions.

Procedure



Created with BioRender.com

Design



Created with BioRender.com

Measures

- First kill time – a measure of decision-making and speed.
- Creep score after first eight waves – a measure of mouse accuracy and timing.

Research question

Can an expectancy effect be demonstrated in an online game?

Main finding

The manipulation of participant **expectation** via pre-match written instructions **did not significantly alter any in-game performance metric** against teams of League of Legends AIs.

Take a picture of the QR code to download the full paper.

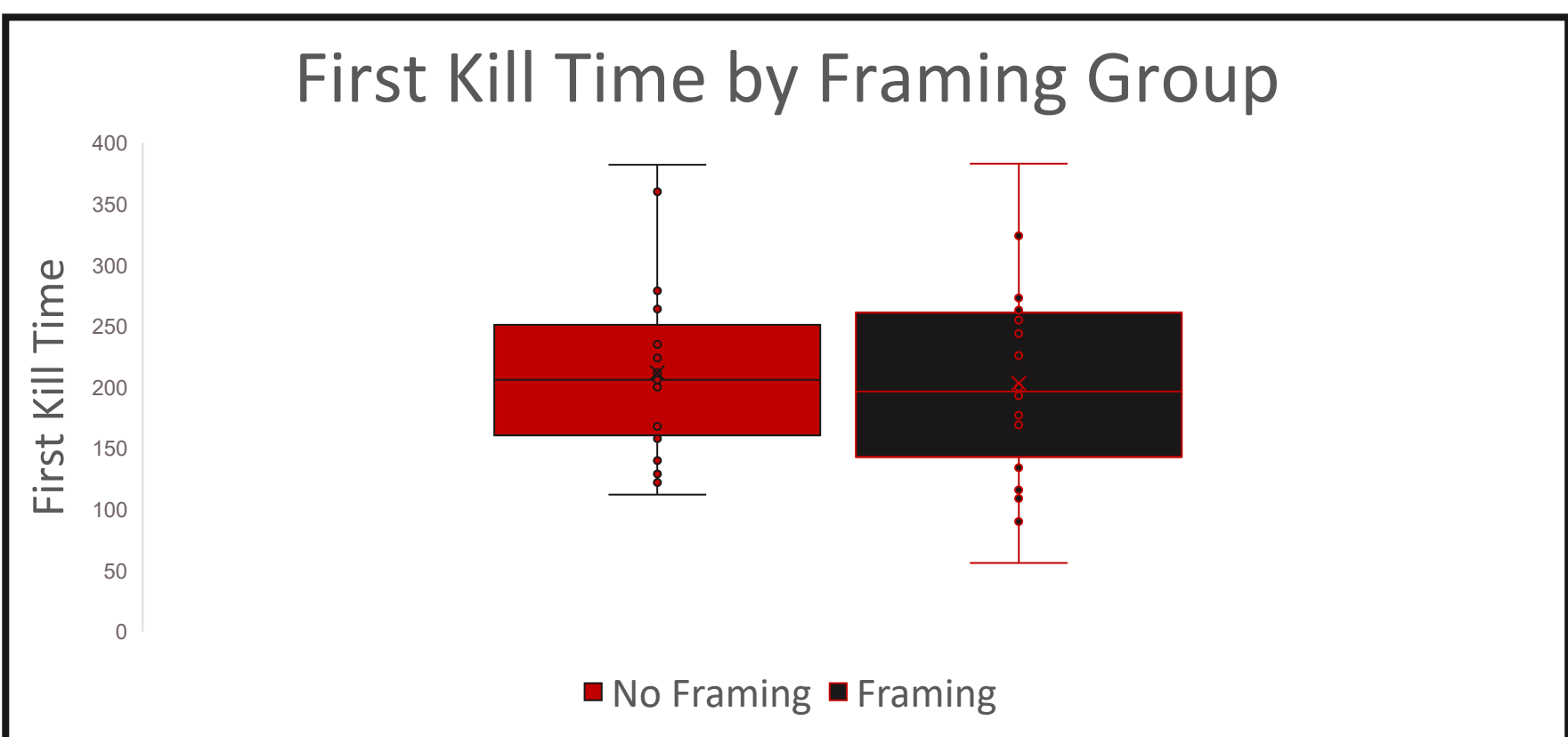


References and Acknowledgements

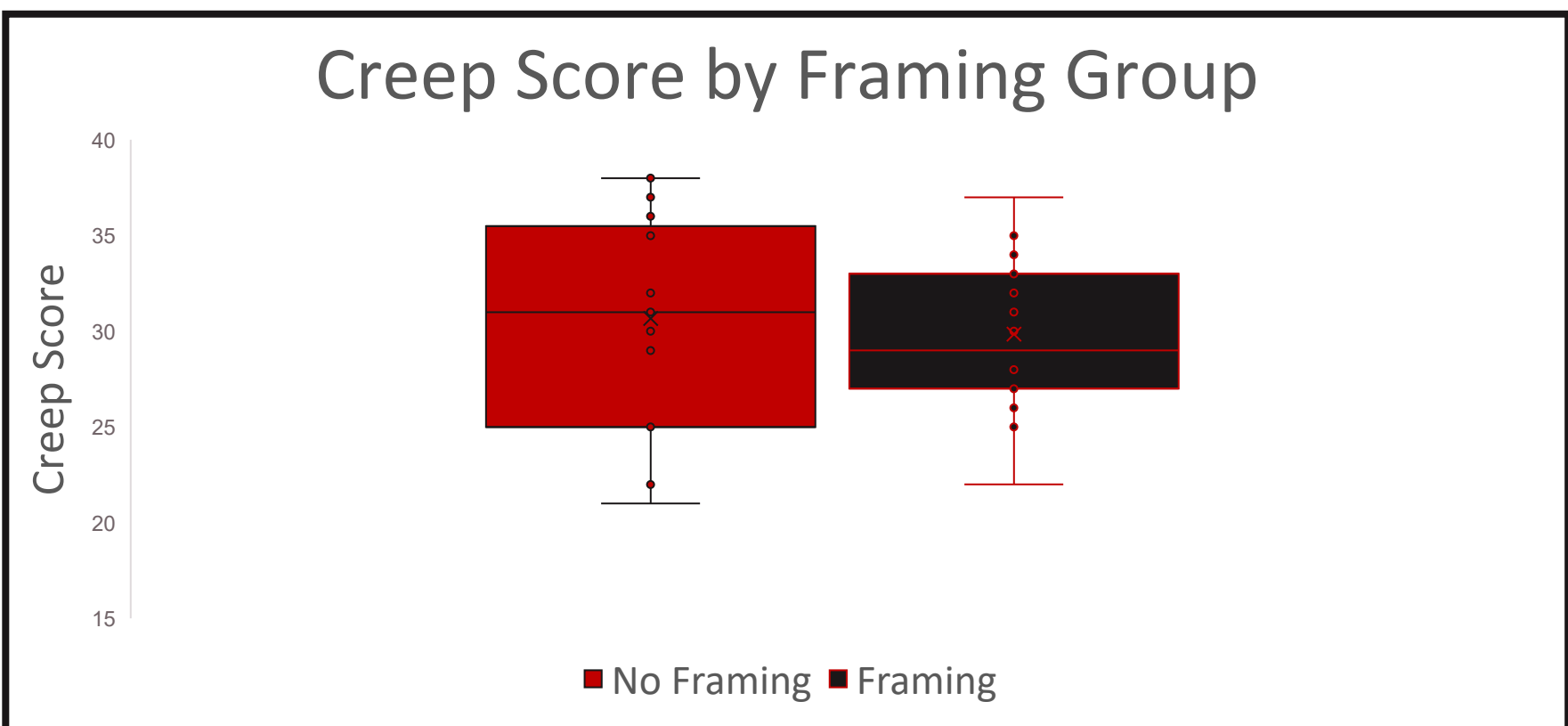
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Results



$t(39) = 0.36, p = 0.72$



$t(39) = 1.14, p = 0.27$

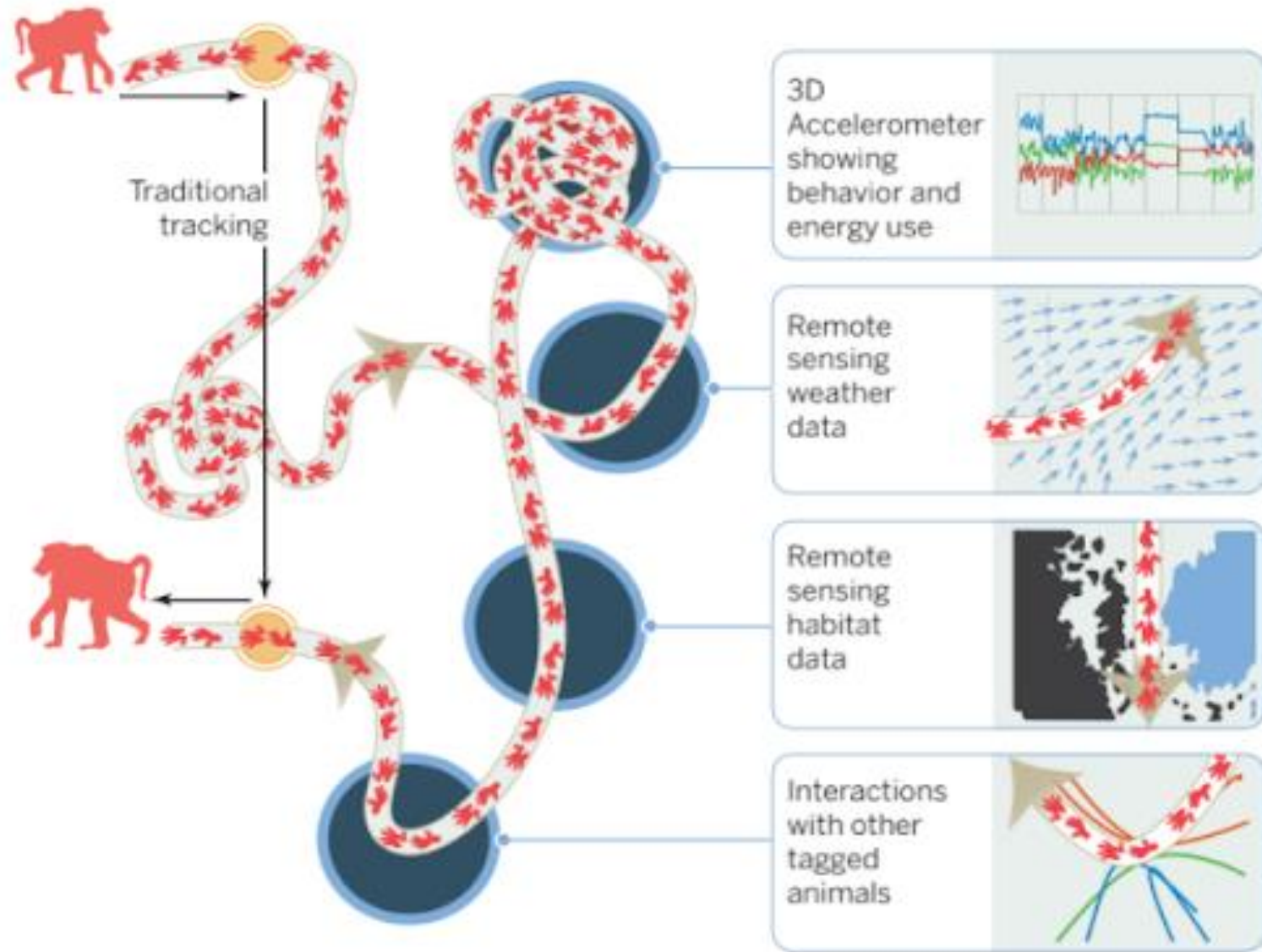
Discussion

Proposed reasons for lack of significant findings

- Expectation does not affect cognitive tasks
- RTS games are not viable psychological tasks
- The effect size for this manipulation is small
- Framing instructions were too weak
- Subpopulations was resilient to expectancy effects as per Atkinson's expectancy-value theory

Future Direction

- With the creation of third-party tracking software akin to high-resolution big data animal tracking an ethogram of in-game behavior could be added to psychological analysis.⁶



Traditional Animal Tracking (Yellow Dots) vs. High-Resolution BigData Animal Tracking (Grey and Red Line). Reproduced from "Terrestrial animal tracking as an eye on life and planet," by R. Kay, 2015, *Science*, 348(6240). DOI: 10.1126/science.aaa2478. Copyright 2015 by American Association for the Advancement of Science

Final thought

- Despite the lack of significant findings, our group still suggests that video games as task environments are ideal for exploring classic psychological phenomenon like placebos through a more objective lens, as this media enables the collection of large amounts high-definition data of a naturalistic activity.