Undergraduate Research Opportunities Programme

University of Reading

LEVERHULME TRUST

Does a lack of control over pain lead to learned helplessness?

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Context of Research

- **Aim:** To characterize the brain mechanisms leading to the development of learned helplessness when exposed to uncontrollable pain. To explain individual differences in the vulnerability/resilience of developing learned helplessness.
- **Pilot Test:** To establish a novel lab-based task to elicit signs of learned helplessness as a consequence of being exposed to uncontrollable pain that can be easily translated to an fMRI brain scan study.

Experiment Development

- The experiment consisted of an introduction (and consent forms), contact information, and multiple questionnaires including the STAI and PANAS. The STAI and PANAS were completed before and after the 'Where's Wally' task, which involved trains of electric shocks applied via an electrode on their right arm.

- PANAS measures positive & negative affect, while STAI measures state and trait anxiety within participants.

- The 'Where's Wally' task consisted of 50 impossible 'Where's Wally' images, each lasting 7sec whilst a train of five painful stimuli was applied. After each trial participants were asked to provide a pain rating, and after every 5 trials an effort rating. Participants were deceived by the experimenter, believing they had control over their pain if they could find Wally.

- I have coded this experiment and the future study in Eprime 2 and 3.

Participant Information

- 30 participants were recruited with an age range of 19 - 62 years (M= 27.83 years; SD = 11.12years).
- 9 identified as male, 21 as female.
- Participants were recruited through social media and SONA.
- Participants with diagnosed chronic pain conditions were excluded from the study.

Research Question

Does the 'Where's Wally' task elicit signs of learned helplessness (increases in negative affect, increases in anxiety, increases in pain ratings, and decreases in motivation)?

Where's Wally Scene

This image is an example of one of the impossible Wally scenes that were presented to the participants.

Key Words

- **Learned Helplessness:** can occur after a person has experienced a stressful situation repeatedly. They believe that they are unable to control or change the situation, so they no longer try
- **Anhedonia:** the inability to feel pleasure, often associated with depression and reduced motivation (DSM-V, 2013)
- **Negative Affect:** Feelings of emotional distress

Results

1. There was a significant increase in anxiety after completing the 'Where's Wally' task (as measured by the STAI score).
2. There was a small trending increase in negative affect after completing the 'Where's Wally?' (as measured by PANAS score).
3. There was no significant effect for pain ratings over time.
4. There was a trending decrease in effort over time.

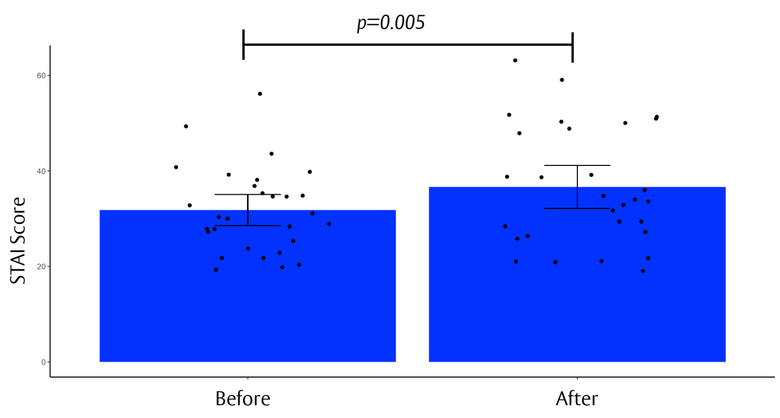

Fig 1. Bar Chart to show mean STAI scores with individual data points and 95% confidence intervals

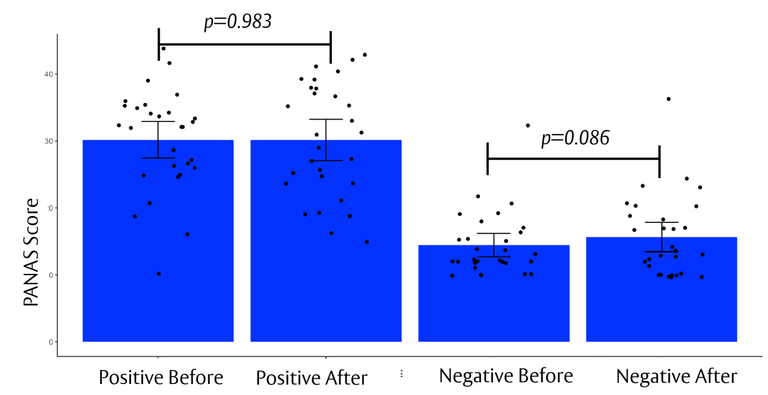

Fig 2. Bar Chart to show mean PANAS scores with individual data points and 95% confidence intervals

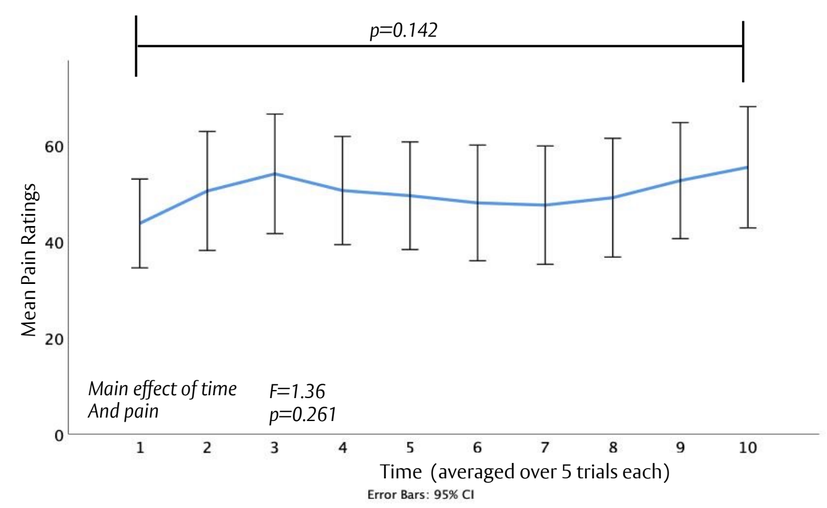

Fig 3. Line graph to show mean pain ratings over time with 95% confidence interval error bars

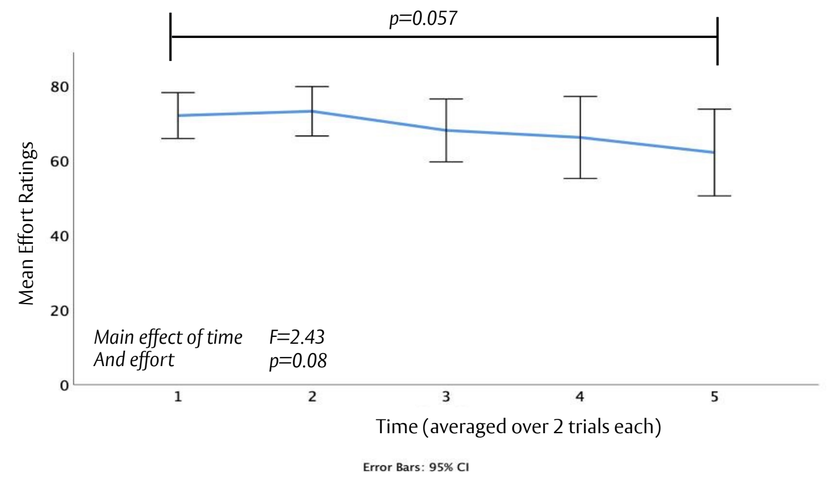

Fig 4. Line graph to show mean effort ratings over time with 95% confidence interval error bars

Future Research

As a pilot study, this experiment has shown that the task does elicit signs of learned helplessness. As a result, future research will examine whether individual reward characteristics predict (1) the magnitude of learned helplessness; (2) individual levels of anhedonia; and (3) explore the brain mechanisms leading to the development of learned helplessness.

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