



STUDYING THE HUMAN MIND USING ONLINE GAMES

Listen to us narrate:



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OUR APPROACH

- Online games**
 The far-reaching web of the internet allows us to collect a **large, rich data set** by making online games out of cognitive tasks.
- Radical Randomization (RR) (Baribault et al., 2018)**
 Traditional laboratory experiments usually have **generalizability concerns** because it is easy for them to see effects that simply land in a **few sweet spots** among a vast ocean of potential variables.



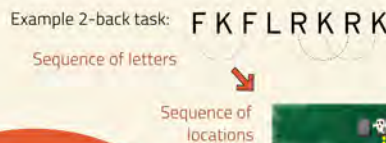
The RR approach investigates the variables that are **pertinent to the hypothesis** as well as those that **seem less relevant**.

A variety of those variables **get randomized** to explore more of the variable ocean and avoid coincidental sweet spots.

GAME 1 GRAVE MISTAKES

GOAL: Study **working memory** through the **N-Back Task**. (Kirchner, 1958)

- What is working memory?**
 A limited storage of **short-term information** to be processed and manipulated. This project focuses on **visual-spatial working memory**, which contains information about what you see and visualize, such as **shapes, colors, and locations**.
 We use working memory in many aspects of everyday life.
 For example, when you...
- What is the N-Back task?**
 Presented with a series of stimuli, like letters or pictures, the participant must determine whether the stimulus they are currently seeing is the same as the stimulus they have seen *n* stimuli ago.



Task: each letter is shown, one by one, in a sequence; indicate when the letter you are currently seeing is the same letter as the one you saw 2 letters ago.

- Gamification**
Task: memorize the locations of a sequence of ghosts.
Gameplay: after each ghost disappears in the fog, select the correct grave in which the ghost resides. The player is given as much time as needed to select each grave.



- Variables**
 - *n* steps back that must be recalled
 - number of graves presented at any given time
 - speed of presentation
 - shape/color of graves/ghosts
 - shape of rows (straight line vs. L shape)
 - visual separation of rows (how close one row is to another)
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GAME 2 RAINBOW RUN

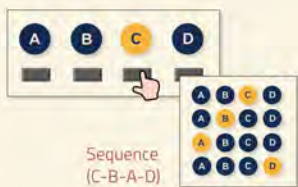
GOAL: Study the **Motor Sequence Learning** through the **Serial Reaction Time Task**.

- What is Motor Sequence Learning?**
 The process by which a **sequence of movements** comes to be performed faster and more accurately than before.
 This happens commonly in our daily life.
 For example, when you learn to...



- What is a Serial Reaction Time (SRT) Task?**
 In a SRT task, participants are asked to repeatedly respond to a fixed set of stimuli.
Faster reaction time suggests that the **learning** takes place.

Nissen & Bullemer (1984):



Task: press the button that corresponded to the light that went on in each trial as soon as possible.

Finding: when the lights went on in a **repeated sequence**, participants' reaction time became **faster** over time.

- Gamification**



Task: Run through a maze of colored tiles, where each color has a unique shape.
Gameplay: Tap on where the next tile appears. The tiles behind collapse in an increasing speed to urge the player to go as quickly as possible.

- Variables**



- number of tiles in a color sequence
- number of colors
- complexity of the shape (number of turns)

- color of the tiles
- shape of the tiles
- starting direction
-

PARTY MODE

- Join a room through a code
- Compete in a series of games
- Earn scores to rank high

Flexibility for radical randomization:
 Traditionally, games get more difficult as a player acquires more experience. In party mode, players are competing against each other, freeing us to select random levels every time a group plays.

TRY IT OUT WITH YOUR FRIENDS!

www.thebraingamelab.org

ACKNOWLEDGEMENT & REFERENCES

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