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Games and Brains

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Can games be more than just fun? The National Institute of Mental Health (NIMH) and the Many Brains Project have partnered to create games that assess mental health through brain function. By collecting data on activity in the brain during games, a database of typical function is formed. Then, this data is compared with abnormal functions to diagnose mental disorders. This is a new way of analyzing mental health: using brain health instead of outside symptoms.

This project has become a part of the National Institute of Health *All Of Us* Research Program, which was created to develop a health database of US citizens. The NIMH Research Domain Criteria Initiative (RDoC) studies mental health based on cognition, mood, and social interactions. RDoC partnered with the *All of Us* Research Program to use their database to identify brain dysfunction and diagnose mental disorders. RDoC assesses brain function using six domains, and then rank function from normal to abnormal. They also consider how physical and social environments impact mental health. The goal of the project is to use deviations from regular brain function to understand symptoms of mental disorders, and learn how to better recognize and treat mental illnesses.

RDoC developed four games that were integrated into the *All of Us* program to collect data. The games are called Guess the Emotion, Left or Right, City or Mountain, and Now or Later. Guess the Emotion shows pictures of people to participants and asks them to identify the person's emotions, which measures their ability to communicate through expressions. Left or Right shows five arrows that change direction, and requires the person to say the direction of only the middle arrow. This analyzes the attention span of the person and their ability to focus. City or Mountain shows participants pictures of fading city and mountain scenes, then asks them to press a key when they see a city scene. This measures attention, control, and speed. Now or Later gives participants different options of money prizes, and requires them to choose whether they will wait a longer time for more money or take less money in a shorter time. This analyzes how people value rewards and how long they will wait.

This data will be put into the *All of Us* database and will be used for future research. These games allow researchers to understand how the functions shown during the games change with mental health. This shows how the brain is affected by mental disorders, and will allow mental disorders to more effectively be diagnosed and prevented in the future.

References:

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