DELAY DISCOUNTING TASK

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REPORT

Github Link: https://github.com/twaritashah/PSY310\_TwaritaShah/tree/Delay\_Discounting\_Task

DELAY DISCOUNTING TASK

Delay discounting refers to decrease in the value of a potential reward when the delay to that reward increases. It is mainly used to measure the individual differences in impulsivity. Individual, situational and contextual factors influence the rate at which people discount future rewards, and greater delay discounting rates have been associated with harmful behaviors including substance abuse and excessive gambling.

Several studies have been conducted to measure the differences in impulsivity when behaviors like gambling, excessive eating and substance abuse take place. In a 2013 study by Price, Lee and Higgs, the relationship between the ability to delay gratification and excessive eating behavior has been investigated by using a monetary delay-discounting experiment. It found that obese participants showed higher discounting behavior than healthy weight participants.

Multiple studies on alcohol and substance abuse have found that higher impulsivity is associated with higher drug usage (Kollins, 2003; Mendez et al., 2010 & Moody et al., 2016). However, a study by Ortner, MacDonald and Olmstead (2003) found that inebriated participants tended to discount delayed rewards at lower rates than sober participants. Hence, impulsivity may not always be associated with alcohol abuse and can be determined by individual differences.

Gambling has also been associated with higher discounting abuse in several studies (Alessi and Petry, 2003). Therefore, it is essential to measure impulsivity and use delay discounting task to design interventions to combat such severe societal issues like eating disorder, substance abuse and gambling.

# Method

The aim of this priming experiment is to assess the participant’s impulsivity on the delay discounting task by calculating the k-value.

**Participant/s**

The test was performed by the experimenter as a part of the Lab in Psychology course at Ahmedabad University.

**Materials and Procedure**

The experimenter received the video explaining the study 24 hrs before it was created and performed. The material used during the creation of the experiment was the experimenter’s personal laptop equipped with the latest version of PsychoPy.

Using the ‘stimuli’ option a cross-shaped polygon indicator was added for the duration of 1 second. Then, in the text properties the following line defining various variables and display text was added:

$"GBP " + str(reward\_today) + " today" + " or" + " GBP " + str(future\_reward) + " after " + str(delay) + " days"

Next, the keyboard responses were defined as ‘l (later)’ or ‘t(today)’. Moreover, an Excel file defining the three variable conditions was added to the trial loop while the ‘nReps’ was kept equal to 3.

Lastly, the experiment was given a test run to see whether it worked reliably before the actual trials started.

**Testing Conditions**

The participant was asked to perform a total of 21 test trials in one session. Hence, she was told to ensure that she was not distracted or disturbed by her surroundings and could perform the task continuously without breaks. These conditions were met sufficiently.

**Data Collection**

PsychoPy directly stores the data it gathers during the experiment in a new Excel file within a predefined folder. Hence, the data was stored reliably and then, cleaned to retain values related to the motor sequence task. The data was categorized by the experimenter into current and future rewards as well as the delay by the participant, to find the estimated discounting value.

**Results**

Using the current and future reward values along with the delay, the k-value for each trial was calculated. It was then sorted from smallest to largest. The formula used for k-value was as follows:

**((Future rewards/rewards today)-1)/delay = k**

Then geometric mean was taken of the values at the point where the response to the rewards was changing from ‘l to t’, using an Excel function. After performing this step, the final k-value was found to be 0.015663621.

Higher the k-value, higher the impulsivity of a person. Hence, we can conclude that as the k-value is quite less, the participant has less impulsivity and is able to delay her gratification more.

**Discussion**

Every individual has a different reaction to the possibility of future rewards, depending on how they perceive them. If one participant has higher k-value, it is completely possible that the next participant has a lower one, as it mainly depends on their response towards rewards. Since, discounting delay task allows for individual differences when performing the task, the discounting value can be considered a good measure for understanding impulsivity in participants. One limitation of using discounting value can be that it only helps us understand how an individual perceives rewards but not why they perceive it in a certain way. Hence, while discounting value is an adequate measure of impulsivity, a better measure can be created in future to completely understand the construct.

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