Delay Discounting Experiment
PSY310: Lab in Psychology
Lab Report

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GitHub link:

https://github.com/devanship-stack/PSY310

Introduction

The delay discounting experiment is an experiment that is used to test the degree of impulsiveness in the subjects. It assesses how the perceived value of a commodity reduces because of a delay in a delivery. According to this definition, the more discounting the more impulsive (Reynolds and Schiffbauer, 2004). In an ideal delay discounting task, the participants are offered a choice between smaller and more immediate rewards and larger and delayed rewards. In this case, preference of smaller and immediate reward is associated with higher degree of impulsiveness, and this also contributes towards examining the tendency of human beings to prefer immediate gratification over long-term gains.

To measure the extent of discounting, this activity approximates a parameter which is usually denoted by the letter ke. This is a parameter that determines the level of discounting of future rewards by an individual. With all these variables, it can be noted that the individuals that have larger kk constants are easier to be affected by the early reward and with a shorter temporal perspective, compared with those that have lower kk constants that are much more self-regulating and patient.

One of the potentials and an important transdiagnostic process in psychopathology has been found in delay discounting. Meta-analyses have been done to contrast the performance of healthy controls on delay discounting tasks with performance of numerous clinical disorders such as ADHD, addiction disorders, depression, disordered eating, as well as psychotic disorders. It was explained that the steeper or higher rates of discounting delay is a sign of a variety of common mental health conditions since it has been associated with numerous disorders (Bailey et al., 2021).

Method

Participants

The experiment was conducted among a group of four 19 year-old students studying in Ahmedabad University. They were briefed about the experiment, and their consent was taken. The purpose of the experiment was to understand human decision-making by examining how individuals weigh immediate rewards against more enormous, delayed rewards, revealing insights into impulsivity and self-control.

Materials required

This experiment was created using PsychoPy3 Experiment Builder (v2021.2.3), on a laptop window of 1440 x 900 pixels. The participants were presented with two reward choices, one

consisting of a smaller immediate reward and the other, a larger delayed reward, as shown in Figure 1 below. The participants were supposed to decide and choose which reward they would prefer. 98 trials were conducted for each participant and their responses were measured which helped in estimating their respective discounting parameters (kk).

Figure 1: Smaller immediate reward option v/s larger delayed reward option

Results

Participant 1 (DD1): k = **0.0001582779361**

Participant 2 (DD2): k = **0.001590879958**

Participant 3 (DD3): k = **0.003905917701**

Participant 4 (DD4): k = **0.01566362141**

A smaller k suggests lesser discounting rates, which indicates more patience and future-oriented thinking, whereas a higher k suggests greater discounting rates, which indicates high impulsivity and present-oriented thinking. As per the findings, we see that participant 1 has a very low discounting rate, which shows that they are extremely patient, and value delayed rewards almost

equally to immediate ones. Participant 2 has a low discounting rate, indicating that they are fairly patient, and have a mild preference for immediate rewards. Participant 3 has a moderate discounting rate, which suggests that they are moderately impulsive and we see a noticeable devaluation of delayed rewards. In the case of the 4th participant, we see that they have a high discounting rate. This means that they are highly impulsive, and strongly prefer immediate rewards more.

Discussion

The final delay discounting value (kk) in the delay discounting task has become a significant measure of difference in impulsivity and time preferences at the individual level. Since it offers a quantitative index with an infinite range of possible values, it is therefore most useful for systematic comparisons of individuals or status on the impulsivity dimension.

The four participants' discounting parameters (k values) show significant individual differences in time preference. Participant 4 had the greatest rate, indicating high impulsivity and a greater tendency for instant gratification, whereas participant 1 had the lowest rate, indicating strong patience and a future oriented approach. A distinct gradient from patient to impulsive decision-making tendencies can be seen in the progression of k values between all the participants (DD1 → DD4).

One sample relates to the evaluation of the brain function, where people with higher kk scores are described as quite impulsive and unwilling to wait, as can be seen in behaviours such as addictions or spending sprees. Even though kk is certainly a good measure of impulsivity, it however, is likely that it does not fully account for the variances. Impulsivity is clouded by a variety of pre-impulsive and post-impulsive processes because it is a complicated construct that reflects several facets of cognition, emotion, and context. In order to provide additional perception of impulsivity, kk should be utilized in conjunction with other behavioural and psychological indices.

References

Bailey, A. J., Romeu, R. J., & Finn, P. R. (2021). The problems with delay discounting: a critical review of current practices and clinical applications. *Psychological Medicine*, *51*(11), 1799-1806. https://www.cambridge.org/core/journals/psychological-medicine/article/problems-with-d

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