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Cognitive bias: Loss aversion.

**1.Definition of Loss aversion:**

*Loss aversion* is a cognitive bias that describes why the pain of losing is psychologically twice as powerful as the pleasure of gaining. The loss felt from money, or any other valuable object, can be worse than gaining that same amount or thing.

Loss aversion refers to a tendency to prefer avoiding losses over acquiring equivalent gains.

Example scenario 1:

A person has 2 stocks. Stock 1, which is currently at a 20% profit, and Stock 2, which is currently at a 20% loss. They need to sell one of the stocks.

Even though rational financial advice would be to sell the stock that is in losses (Stock 2) most people will tend to sell the 1st stock (which is at 20% profit), and not sell the 2nd stock (which is at 20% loss) to avoid realizing a loss.

For that person, the pain of accepting a loss (selling Stock 2 at a loss) is greater than the pleasure of securing a gain (selling Stock 1 at a profit).

In this way many people hold on losing stocks (stocks in loss) instead of selling them.

Example scenario 2:

A person at a casino has lost 1000 rupees and has two options:

Option A: Walk away, accepting the loss.

Option B: Continue gambling with a chance to win back the 1000 rupees or lose even more.

Many people continue gambling to win as soon as possible and avoid the pain of the loss, often leading to greater losses, demonstrating risk-seeking behavior to recover losses.

Example3:

Many people will stay in bad relationships because they are afraid of pain of break up

**2.Hypothesis:**

Participants who have experienced a financial loss at a casino are more likely to engage in risk-seeking behavior by continuing to play another time to recover their losses, rather than accepting the loss and walking away. This behavior is driven by the psychological principle of loss aversion, where the pain of losing some amount of money outweighs the potential risk of losing additional money.

**3.Experiment:**

Participants:

A sample of individuals who are regular casino visitors or players.

**Procedure:**

Participants are then informed to assume that they have lost $100().

Participants are presented 2options:

Option A: walk away, accepting the 1000 rupees loss.

Option B: Continue playing with a chance to win back 1000 rupees or lose even more.

Plan:

We will design an experiment in psychopy by displaying those 2 options and collecting the EEG data from participants while displaying the options to select. We should design the experiment such that they can press a(key) for option A and press b(key) for option B and store all the responses by the participants.

We can also change the amount (i.e. replacing 1000 by 100, profit of a 100, ...etc.) and observe the change in responses and eeg signal.

4.Data Analysis:

A person with loss aversion will choose option B because he/she will try to decrease pain of losing by taking risk to play again even if they may lose more. And a person without loss aversion will select option A. So, from the no.of responses (no.of people chosen option A and no.of people have chosen option B) we can conclude the bias.

We can observe the change in eeg signal pattern based on loss or profit and amount of loss or profit.