

# Poverty and decision-making under risk: Poor are insensitive to losses but not to gains

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## Abstract

Poverty is one of the most urgent societal problems. It has been shown that poverty directly impedes cognitive functioning. Here, we compare decision making under risk of a sample of poor and a sample of rich individuals. We find that poor are selectively insensitive to losses but not to gains. Faced with the possibility of losing, poor people avoid risk, careless of the magnitude of the loss.

## Theoretical background

Poverty has been found to impede proper cognitive functioning (1, 2). Poor are also less likely to escape from poverty, a circular self-reinforcing mechanism known as the "poverty trap" (3). According to a recent view, poverty induces negative stress and this in turn leads to short-sighted and risk-averse decision making (4). A maladaptive decision making style is repeatedly found in other disadvantaged populations (substance-dependent individuals, at-risk adolescents, maltreated children) (5 - 8).

Poor seem to have a different pattern of decision-making behavior than rich, however, sometimes they are even more rational (9 - 13).

We explored the possibility that poverty impedes normal decision making ability under risk. In this study we compared poor and rich's ability to adapt their choices to variations in the gains, losses and probability of the loss.

## Procedure

Fifty poor and fifty rich individuals from the city of Lima, were asked to play the Columbia Card Task (CCT; cold version; 14), for real money (Fig. 1).

## Why Lima?



## The Risk-taking Task

The CCT (14) incorporates both rewards and penalties and both vary in magnitude and in probability.

On each trial, the individual chooses how many cards to turn from a matrix of 32 facedown cards. Each card is associated to an outcome. The possible outcomes were a large reward (1,5 Nuevos Soles), a small reward (S/.0.5), a small penalty (S/.6), and a large penalty (S/.18). The penalties are also associated to a high probability (3 cards in 32) or a small probability (1 card in 32).

On each trial the individual is informed about the entity of the reward, the entity of the penalty and the probability of encountering the penalty. When participants finish selecting cards they press the stop button and the cards that they have chosen are revealed. Participants receive the corresponding reward amount for all the gain-cards selected; however, if they have selected a loss-card, the round is over (i.e., the gain-cards turned over after the loss-card in that game are not paid) and the loss amount is subtracted from the gain they had accrued in the current round.

Gain amount, loss amount, and the probability to lose, were varied between trials in a full factorial within-subject design, presenting each of the 8 combinations of factor levels three times (3 blocks) resulting in 24 trials for each participant.

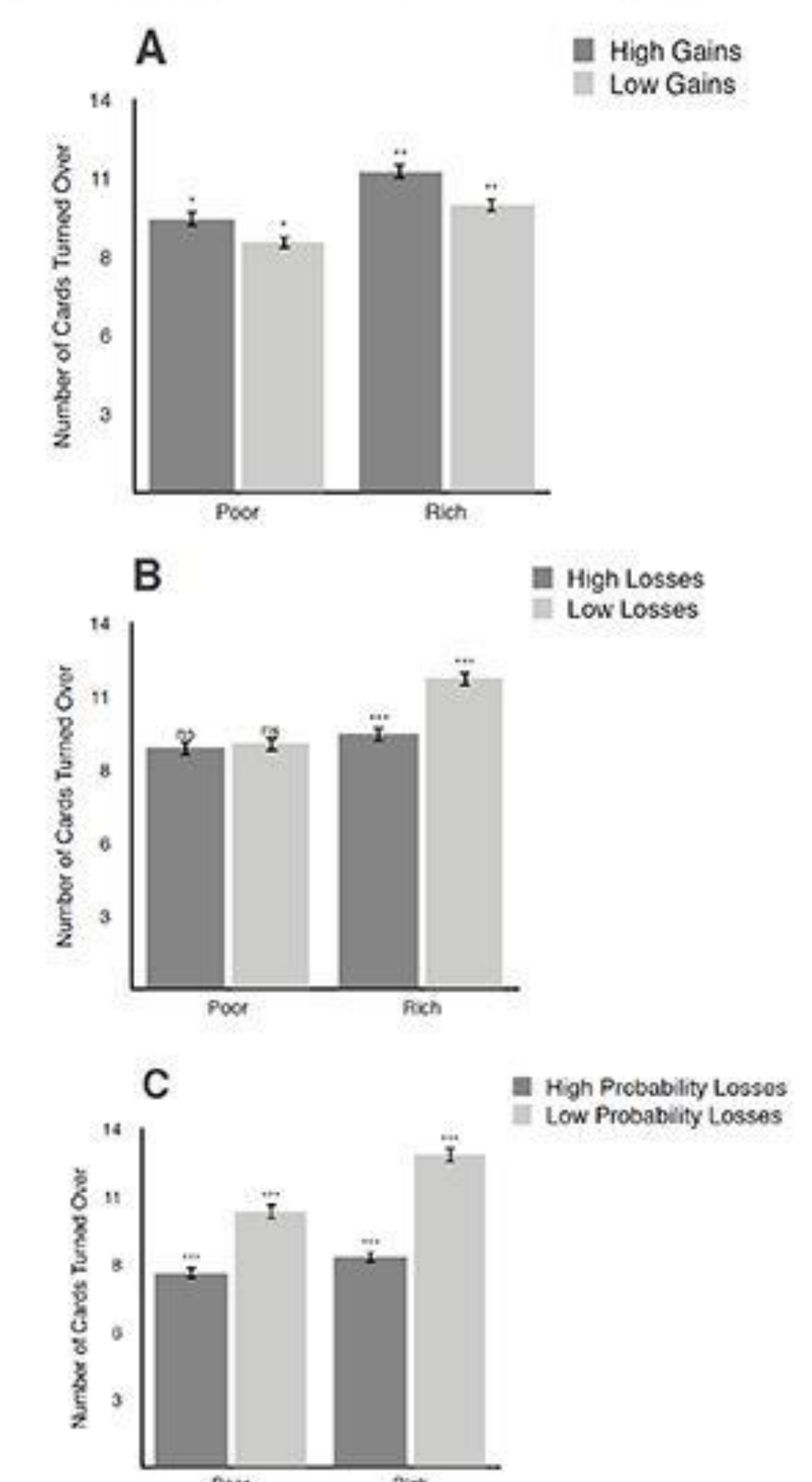
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## Results

Both poor and rich turned over more cards when the reward was large than when the reward was small, [F 1, 2286= 27.444, P = 0.000]. **Only rich turned over less cards in trials with a large penalty compared to trials with a small penalty, while poor turned the same amount of cards in both large penalty trials and small penalty trials, penalty \* group interaction [F 1, 2286= 26.460, P = 0.000].** Rich correctly turn over more cards in trials with a small probability of penalty than in trials with a large probability of penalty, while poor did it significantly less often, probability \* group interaction [F 1, 2286= 18.784, P = 0.000].

## Results

Fig. 2. Number of cards turned over (risk-taking) by poor and rich when the reward (A), the penalty (B) and the probability (C) varied



## Discussion

Poor individuals showed a specific decision making style: they respond only to variations in gains but not in losses. Our findings imply that poor might refuse to make any investment (study, work), if they think that there could be even a very small possibility that their time or effort will not be compensated.

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