Loss Aversion and Risk for Cigarette Smoking and Substance Abuse
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Background

• Behavioral Economics has identified systematic biases in decision making.
• Losses loom larger than gains (Kahneman & Tversky, 1979).
• Might be related to risky or unhealthy behavior (e.g., substance use despite negative consequences).
• Is Loss Aversion a protective factor?
• Involvement of considerable loss of opportunity, money, relationships, etc.
• Low Loss Aversion has been found in SUD, but studies did not control for other decision-making biases in decision making.

Method

Design
• Adult (18-55) daily cigarette smokers (>10 per day) and adult never-smokers (<100 lifetime) from Mechanical Turk.

Measures
• General health items, Loss Aversion (coin flips; 2:1 or 5:1), Delay Discounting, or SUD risk (smoking), or sociodemographic (age, gender, education) factors.
• This experiment addressed the following:
  1. Are cigarette smokers less loss averse than non-smokers?
  2. Does Loss Aversion predict smoking?
  3. Does Loss Aversion predict other substance use (alcohol, other drugs) and other behavioral health problems (sleep disturbance, depressed mood)?

• Sample Characteristics

Results

• Low LA increased risk of substance use even in the presence of Low DD.
• Differences in Loss Aversion remained highly significant when accounting for socio-demographics and differences in Delay Discounting.

Discussion

• Smokers were less loss averse than never-smokers.
• Never smokers accepted half the gambles consistent with losses having twice the value of equivalent gains.
• Smoking systematically accepted more gambles which suggests that losses had a weaker influence on choice.
• Smokers discounted more steeply than never-smokers (a control measure).
• Differences in Loss Aversion were also observed among groups dichotomized on other substance use items (alcohol, other drugs), but not other behavioral health problems (sleep disturbance, depressed mood).
• Differences in Loss Aversion remained highly significant when accounting for socio-demographics and differences in Delay Discounting.
• Loss Aversion and Delay Discounting are strong and independent risk factors for cigarette smoking and other substance use.
• Crowdsourced sample limits strong conclusions.
• Additional work is underway to extend this procedure to a diverse and representative sample.
• Loss Aversion deserves attention as a possible preventive factor and intervention target.

Outcomes
• Differences in Loss Aversion were also observed among groups dichotomized on other substance use items (alcohol, other drugs), but not other behavioral health problems (sleep disturbance, depressed mood).

Analysis of Loss Aversion and Delay Discounting as risk factors
• With the entire sample, we created four groups based on median splits of Loss Aversion (High LA, Low LA) and Delay Discounting (High DD, Low DD).

• Logistic regression found that having low LA increased risk of substance use across each substance use category.
• Low DD increased risk of substance use even in the presence of High DD.

• Interestingly, the reverse was not observed: High DD did not increase risk for substance use in the presence of Low LA.
• Low loss aversion and high delay discounting may not be additive on risk for substance use.

• Other analysis suggest that LA is related to severity, but range is restricted in this dataset (>10 CPD criterion).
• Sample means were less loss averse than never smokers.

• Never smokers were less loss averse.
• Smokers were less loss averse than never smokers.

• At 2 levels of gambles value (2:1 Gains and 2:1 Losses)

• Difference was strong when accounting for Delay Discounting.
• At 2 levels of gambles value (2:1 Gains and 2:1 Losses)