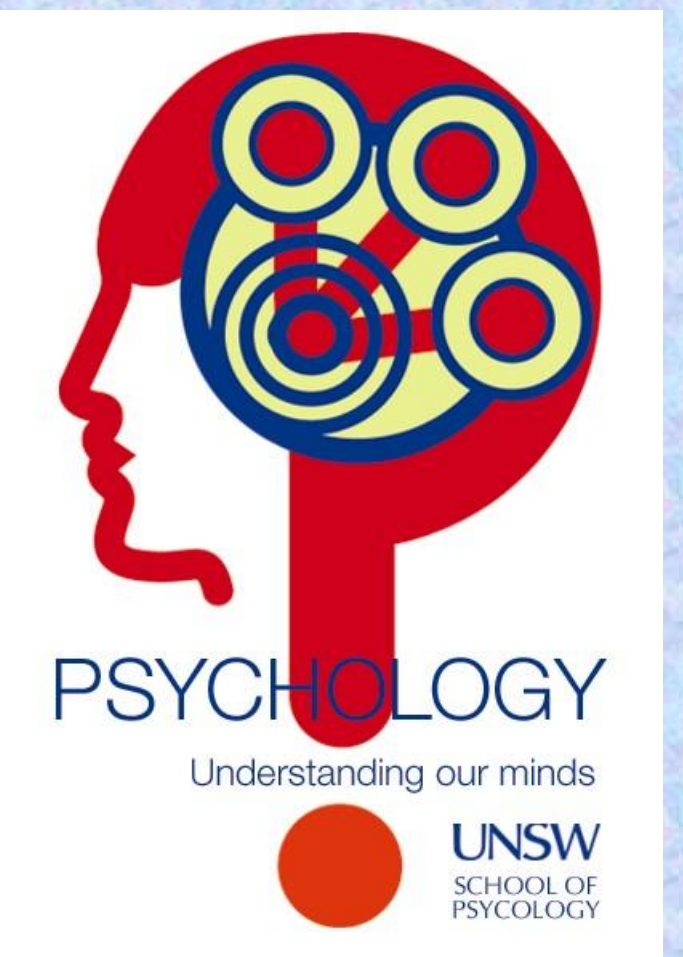




Mind the Gap: Within-subject Preference Reversals in Description and Experience-based Choice

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Two Ways of Acquiring Information

- In the field of risky choice, the classic research by Kahneman and Tversky remains significant. They found that choice behavior does not adhere to rational choice axioms, but instead follows the fourfold-pattern:
 - Risk averse for gains and risk seeking for losses of high probability.
 - Risk seeking for gains and risk averse for losses of low probability.
- Accordingly, people prefer sure wins to riskier options with higher expected values, and make decisions as if options with very low probabilities are overweighted but options with moderate and high probabilities are underweighted.
- For years it was assumed that these behaviours generalized to all formats of risky choice. A number of recent studies have challenged this assumption, and argued that the means by which information about potential outcomes and their relative likelihoods is acquired can influence the decision made.

Decision-from-Description

- Outcomes and their respective likelihoods are clearly described from the outset.
- In the lab, participants are presented with two labeled gambling machines and are asked to select their preferred option to play from (Figure 1).

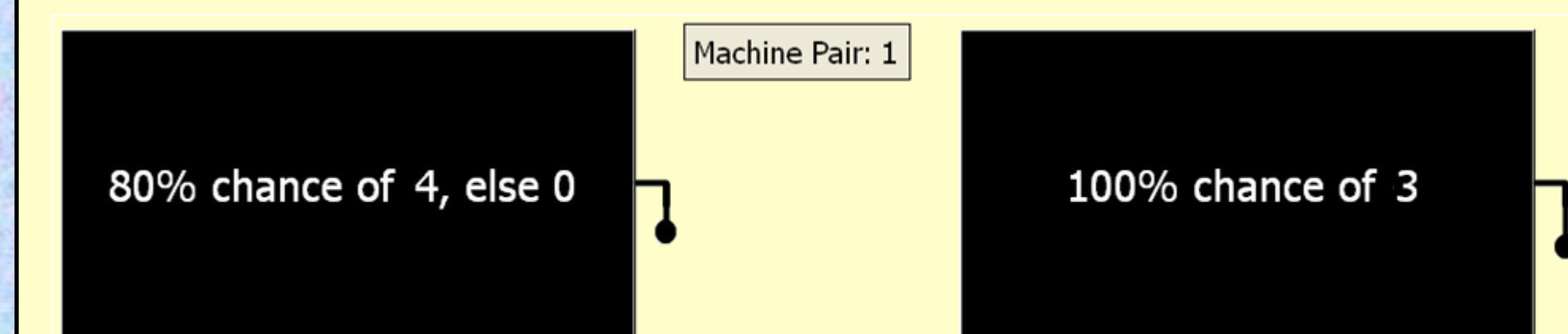


Figure 1. Screenshot of Description-based choice task

Decision-from-Experience

- Outcomes and their respective likelihoods are initially unknown and are learned through exploration and feedback.
- In the lab, participants are presented with two unlabeled gambling machines that they are asked to sample from (Figure 2). Each sample returns a value randomly selected from a static payoff distribution corresponding to an objective probability that is unknown to the decision-maker (e.g., machine A's distribution might be "80%: 4, 20%: 0"). After the decision maker is satisfied with their exploration, they select their preferred option to play from.

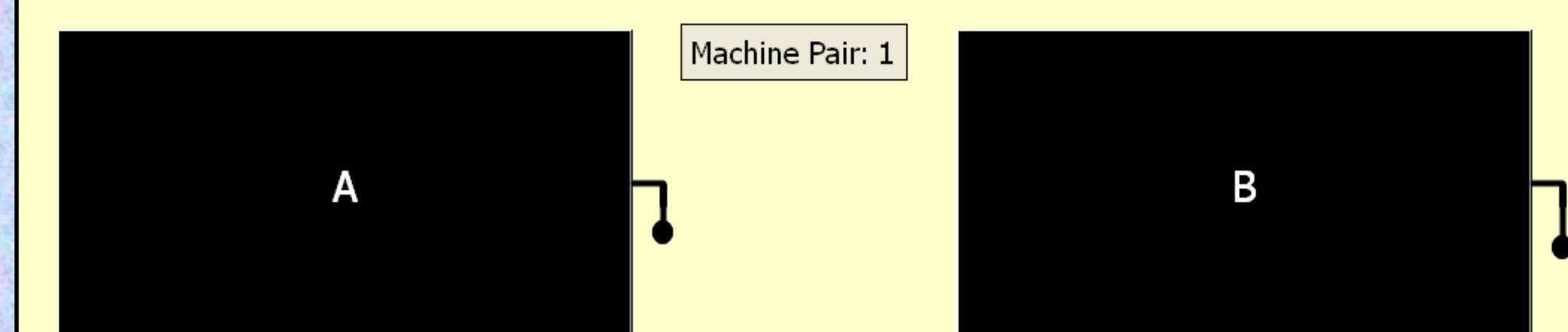


Figure 2. Screenshot of Experience-based choice task

Does Choice Depend on Mode of Acquisition?

When the same gamble is presented to two groups of people – differing only in the mode of information acquisition – striking differences in the patterns of choice are observed:

- In the description-based format, the large majority of people prefer the option containing the rare event, when the rare event is desirable (henceforth, "favoured" option).
- In the experience-based format, the exact opposite is true.
- This Description-Experience 'gap' has been replicated on numerous occasions with a range of gamble problems. Curiously, they have all used a between-subjects design.

➤ **Aim 1: Examine individual preference reversals to equivalent gamble problems as a function of how information about the gamble is acquired.**

What Causes the Gap?

- Small, and therefore, biased samples that under-represent rare outcomes may be a key driver of the 'gap'.
- Does the gap remain when sampling bias is controlled? Existing evidence is equivocal.

➤ **Aim 2: Examine whether the gap is a statistical phenomenon by conditionalising only on trials where the participants' experienced distribution is approximately equal to the objective distribution.**

Are there Mediating Individual Differences?

- In the context of risky choice, one of the most interesting individual difference is risk attitude, that is, the degree to which an individual engages in risky behaviors.
- **Aim 3: Examine the relation between individual differences in risk attitude and choice, and investigate the possibility that the size of the gap is mediated by risk attitude.**

Methods

- N = 40
- Four-stage (counterbalanced) within-subjects design:
 - Description-based choice task
 - Filler task
 - Experience-based choice task
 - Risk Attitude Measure
- I.V.: Ten binary-choice problems (each with a safe and risky option) presented in either description format (Figure 1) or experienced via a sequential sampling paradigm (Figure 2).
- D.V.: Choice made for each gamble problem.
- Risk attitude measured using the self-report Domain Specific Risk-Taking Scale (DOSPERT; Weber et al., 2002).

Results

1. Does Choice Depend on Mode of Acquisition?

- A preference switch occurred between structurally equivalent Description- and Experience-based choices on 48.2% of gambles. When a change in preference did occur, 72.5% of these switches were in the predicted direction.
- Individual Description-Experience gap scores were calculated for each participant (Figure 3):
 - 32 participants showed a gap in the predicted direction.
 - 5 participants showed no gap.
 - 3 participants showed a gap in the non-predicted direction.

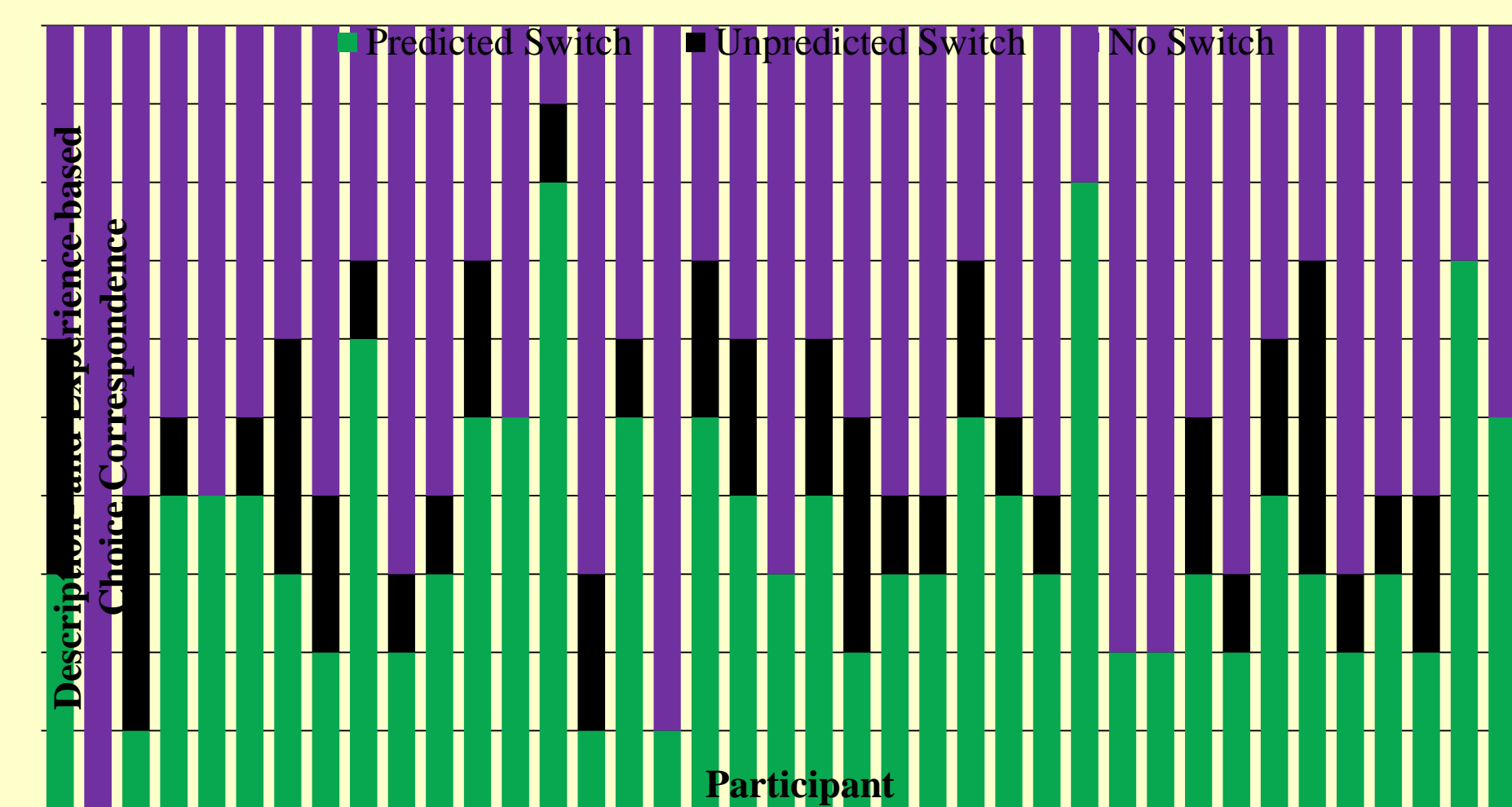


Figure 3. Degree of choice correspondence between description- and experience-based choices for each participant across the ten gambles.

2. What Causes the Gap?

- Averaging across problems and individuals, the favoured option was selected on 53.3% of trials in the Description condition and on 31.3% of trials in the Experience condition: the Description-Experience 'gap' (Figure 4, leftmost).
- To try and account for the impact of sampling bias, the data was reanalysed to include only trials where participants' experienced distribution was nearly equal to the objective distribution. Now, when averaging across problems and individuals, the favoured choice was selected on 52.3% of trials in the Experience condition, entirely eliminating the gap ($p > 1$, one-tailed; Figure 4, rightmost).

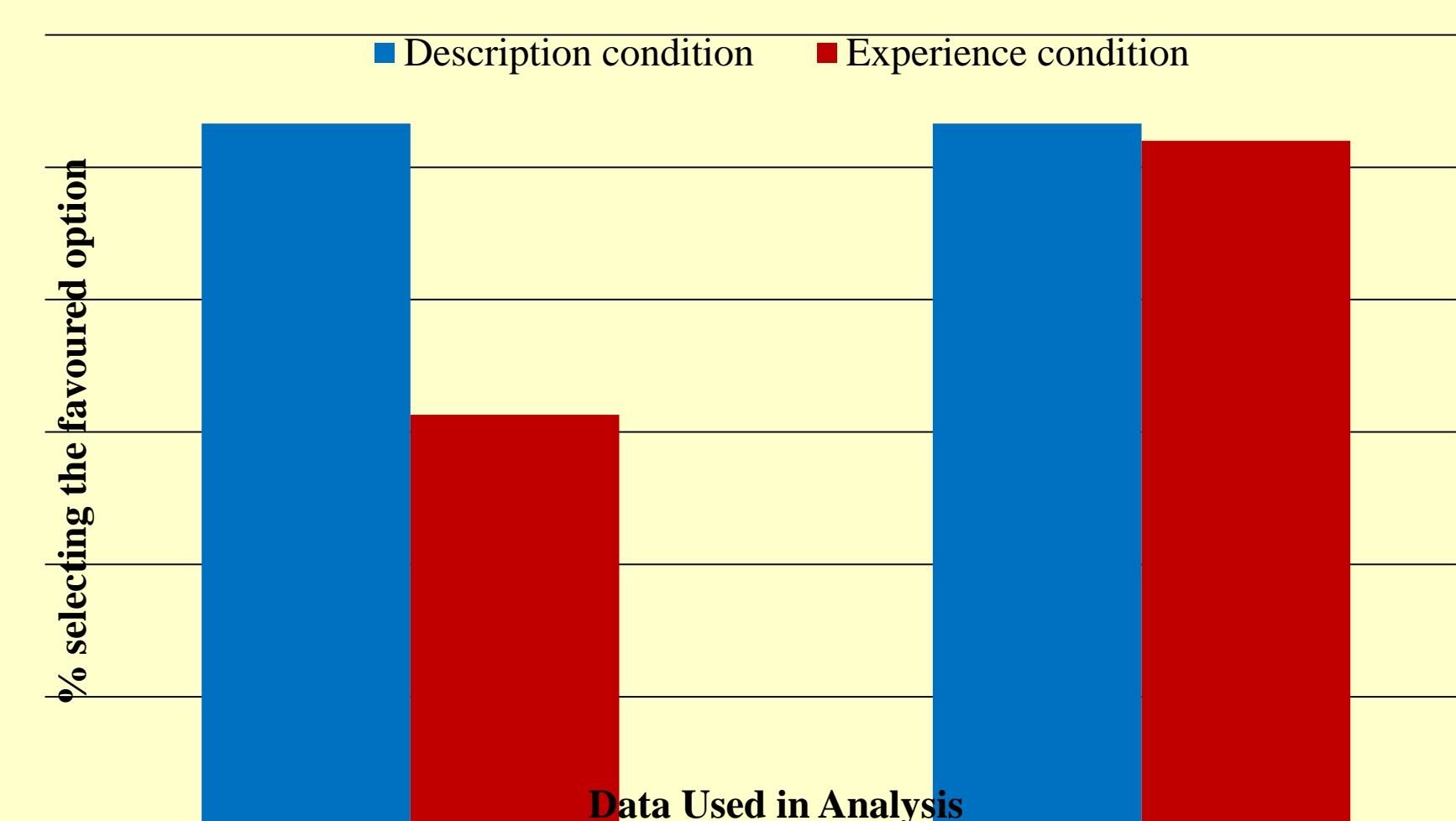


Figure 4. Percentage selecting the favoured option (i.e., the option containing the rare event when the rare event is desirable).

Results

3. Are there Mediating Individual Differences?

- Participants' average number of risky choices made in the decision-from-description paradigm was significantly positively correlated with their average behavioural risk score ($r = .40, p < .05$; Figure 5) and negatively correlated with their average perceived risk score ($r = -.37, p < .05$).
- There were no significant correlations between participants' average number of risky choices made in the decision-from-experience paradigm and scores on the DOSPERT.
 - When sampling bias was taken into account and the data trimmed, participants' average number of risky choices was non-significantly positively correlated with their averaged behavioural risk score ($r = .30, p = .12$) and negatively correlated with their averaged perceived risk score ($r = -.36, p = .06$).
- Risk attitude did not mediate choice preference reversals, sampling strategy adopted, or propensity to make decisions in accordance with EV.

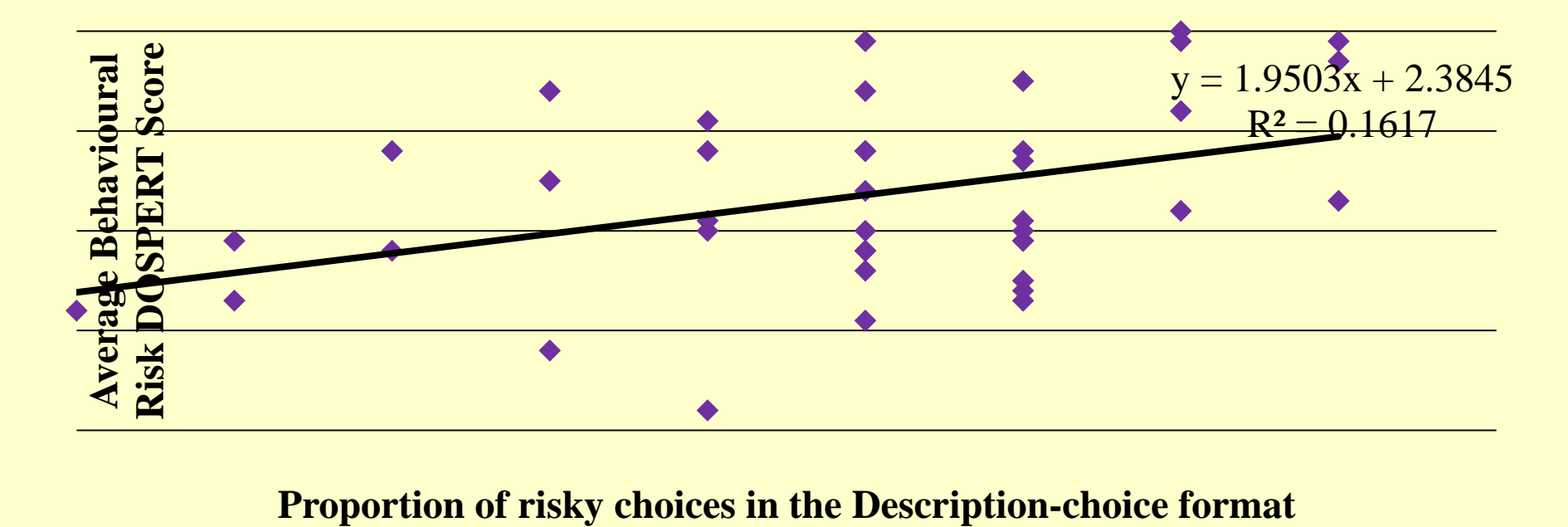


Figure 5. Scatter plot of risk attitude and propensity to select the risky option when choice was presented in the description format.

Conclusions and Implications

- There exists a difference, or 'gap', between people's choice preferences depending on whether their decision is made from experience or description. This difference has implications for a range of issues including the development of organisational strategy, the formation of social impressions, the use of safety devices, and tourist responses to terrorist attacks.
- The gap can be eliminated when controlling for sampling variability. This observation suggests that sampling bias is a primary cause of the gap, and has implications for theory and model development.
- Riskier decisions are made by those with greater risk attitudes. More evidence is needed to discover if risk attitudes are good predictors regardless of format.