Testing the Elicitation Procedure of the Minimum Acceptable Probability

Maria Polipciuc* Martin Strobel*

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Abstract

*Maastricht University. Email: m.polipciuc@maastrichtuniversity.nl. We thank Elias Tsakas and participants in the BEELab proposal meeting for valuable comments.

1 Introduction

Individuals have often been found to prefer exposure to a randomly generated risk than to an equiprobable risk generated by an opponent in a strategic situation. This strategic risk premium has been dubbed *betrayal aversion* (**?**). Many papers find that betrayal aversion is an important determinant of trust CITE.

A recent paper has shown theoretically that the elicitation procedure of minimum acceptable probabilities (MAPs, from which betrayal aversion is identified) used in most papers leaves the door open to potential confounds such as "ambiguity attitudes, complexity, different beliefs, and dynamic optimization" (**?**) if players are not rational expected utility maximizers. Moreover, a couple of empirical papers which use more stringent identification procedures for betrayal aversion by controlling for beliefs do not find betrayal aversion (**??**), or find it to play a role for trusting only when beliefs are far more optimistic than is generally the case (**?**).

In this note, we use an online experiment to measure how much of what has been called betrayal aversion is due to distributional dependence, regardless of the source of risk being random or strategic. To do this, we show participants complete distributions over probabilities of the good (bad) outcome of a lottery, and ask them for their cutoff value probability of the favorable outcome for preferring the lottery to a safe payoff. Should the numerical example in **?** be applicable to our setting, we expect participants to more readily accept the lottery when it comes from a distribution with a higher expected value. We find the opposite to be true: the higher the expected value of the probability of the favorable outcome, the higher the minimum acceptable probability required by participants to accept the

lottery.

While this is at odds with our expectations, it ties in with some results from the empirical literature on distributional dependence of willingness to pay (WTP). To make this clear, we first explain how betrayal aversion is related to WTP. I need something here... Betrayal aversion is identified as the difference between two minimum acceptable probabilities: the minimum required probability of trustworthiness in order to trust in a trust game, and the minimum required probability of a favorable outcome in an equiprobable control game, where risk is generated by a randomization device. The MAPs are elicited through a variant of the Becker-Degroot-Marschak (BDM) (**?**) mechanism, which an often used mechanism for eliciting valuations. There a couple of differences: (1) the auctioned good is a lottery, (2) instead of giving a maximum price for which they prefer the good to a safe payment, participants are asked to state a minimum probability of the favorable outcome of the lottery for which they prefer the lottery to a safe payment and (3) the underlying distribution of the probability of the favorable outcome is not explicitly uniform, as in the case of the distribution of potential prices for the good.

Theoretical literature has pointed out that the BDM mechanism is not incentive compatible if players are not rational expected utility maximizers (**??**). This is because individuals face uncertainty regarding the price of the good and additional uncertainty about whether they will buy the good or not. If their utility function is influenced by these uncertainties, changing the price distribution of the good might influence their MAP.

Several empirical papers find this to be the case: generally, the higher the expected price of the good, the higher the WTP (**?**, for a short review of this

literature, see).

Imagine a lottery and a sure payment. You know how much you receive if you win or lose the lottery, but you don't know the chances of each outcome. Now imagine you have to write a contract specifying how good the lottery minimally has to be for you to prefer the lottery over the sure payment. Would the requirement you set in the contract be independent of how likely you think more (less) favorable lotteries are? As an example: would you set the same requirement in two situations, one in which favorable lotteries are more likely, and the other in which unfavorable lotteries are more likely?

From a theoretical point of view, things are clear. If you are a rational expected utility maximizer, the requirement should be the same in both situations. If you're not and the context influences your decisions, it is not so clear which way things will go. Will you require a better or a lesser chance to take the lottery in a world of better opportunities?

This note reports the findings of an online experiment designed to test whether a more favorable underlying distribution of the chances of the lottery influences the threshold people require. Our interest in this question was sparked by previous work on betrayal aversion. Betrayal aversion has been identified as one of the factors influencing the decision to trust. It is defined as an anticipatory disutility from expecting one's trust to be betrayed. Betrayal aversion has been identified as the premium required to trust someone relative to accepting an equiprobable lottery with equal payoff consequences for an uninvolved other.

Most older papers on the subject of betrayal aversion find a positive strategic premium. Some papers however do not. **?** propose that the original BZ design might have miss-classified the premium as betrayal aversion. They argue that,

should participants not be rational expected utility maximizers, the premium could be attributed to "ambiguity attitudes, complexity, different beliefs, and dynamic optimization".

In this note, we examine the effect of one of these potential confounds: different underlying distributions of the lottery's winning chances.

2 Procedures

We use three distributions, which are ordered in terms of the expected payoff over the entire distribution, as their name suggests: the Good, the Bad, and the Uniform. Two of the three distributions were selected to emulate treatments in papers on betrayal aversion. The Uniform treatment has equal chances of occurrence for each of the possible lotteries. We assume that this is what participants expect to face in treatments with computer drawn lotteries, unless specified otherwise. The Bad treatment has an overall chance of a high payoff equal to the percentage of trustworthy respondents in papers on betrayal aversion. The distribution in the Good treatment mirrors the one in the Bad treatment: it has the same variance, and minus the skewness of the Bad distribution.

include table describing distributions

Participants have to state a *minimum acceptable probability* (MAP): the lowest chance of a favorable outcome of the lottery such that they prefer the lottery to a sure payoff.

Several papers CITE find that when dealing with complex risks, participants in experiments require an extra premium compared to simple risk aversion. This premium is positively correlated with ambiguity aversion. (ARE EFFECT size

similar?)