

# Gambles vs. quasi-realistic scenarios: Expectations to find probability and risk-defusing information

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## Abstract

The paper investigates predecisional information search in risky decisions, specifically information concerning the probability of a negative outcome and whether a risk-defusing operator (RDO) is available. Experiment 1 (54 participants) tested the hypothesis that search for such information is triggered by expectations that it can be obtained in the situation. Cues for the availability of information were manipulated. It was predicted that cues mentioning possible information sources raise expectations and consequently increase search activity. Furthermore, gambles were expected to differ from other real world contexts, with lower expectations for RDOs and higher ones for probabilities. The Method of Active Information Search was employed. The number of questions asked about probability and RDOs in different conditions confirmed the hypotheses. Experiment 2 (36 participants) ruled out the alternative interpretation that the expectation to actually find favorable probabilities or applicable RDOs respectively, rather than the expectation to obtain information, determined information search.

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## 1. Introduction

Classical decision theory found decision behavior in a risky decision situation to be a function of the subjective values (utilities) of the outcomes and their subjective probabilities (cf. e.g., Fox & See, 2003). This general result has been obtained with experiments using gambles as alternatives or structuring the decision alternatives like gambles. Gambles are considered as abstract representations of risky decision tasks in general.

Recent experiments with quasi-realistic risky scenarios reveal, however, a different picture: most decision makers in a great variety of tasks do not search for probability information and often, risk-defusing behavior is a central component in the decision process (Huber, Beutter, Montoya, &

Huber, 2001; Huber & Huber, 2003; Huber & Macho, 2001; Huber, Wider, & Huber, 1997; Ranyard, Hinkley, & Williamson, 2001; Ranyard, Williamson, & Cuthbert, 1999; Schulte-Mecklenbeck & Huber, 2003; Tyszka & Zaleskiewicz, 2006; Williamson, Ranyard, & Cuthbert, 2000a; Williamson, Ranyard, & Cuthbert, 2000b). If decision makers realize that an otherwise attractive alternative may produce a negative outcome, they search for a risk-defusing operator that eliminates or reduces the risk involved. The experimental procedure of these experiments differs in two main respects from that in “standard” experiments in risky decision making: (1) the setting allows decision makers to search for the information they are interested in, and (2) in the initial presentation of the decision task, the *possibility* of a negative outcome is only mentioned, but probabilities are presented not before participants search that information. Huber (in press) reviews experimental results in connection with risk defusing.

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In these experiments with quasi-realistic scenarios, there is a large variability among tasks, in the search for probability information as well as in the search for possibilities to control the risk. In our view, an integrative descriptive theory of risky decision making is not only to explain the variability among quasi-realistic scenarios, but also the differences between results obtained with these scenarios and with gambles. The present paper proposes the expectation to find useful information about probability and about the existence of risk-defusing operators as components of such an integrative theory.

### 1.1. Risk defusing in the decision process

A *risk-defusing operator (RDO)* is an action anticipated by the decision maker to be performed *in addition* to an available alternative in order to decrease the risk. Consider, as an example, the *Post*-scenario used in Huber et al. (1997). In this scenario, the participant takes the role of the manager of a post office in a small town who has to decide in early summer whether to rent or not to rent additional space for the post office for November and December. The rent is CHF 12.000, – (about €7.800). This additional space would be necessary if the number of Christmas parcels to be handled is large but unnecessary otherwise. The number of Christmas parcels is uncertain. In this scenario, many decision makers prefer the alternative not to rent additional space. This alternative involves the risk that there is too little space to handle a large amount of Christmas parcels. Facing that risk, decision makers often come up with the solution that they would choose the alternative not to rent additional space but – for the case that the number of parcels would turn out to be high – they would order a contract to set up several office containers in the yard of the post office, which could be done at short notice. Ordering the contract to set up the containers is the RDO planned by the decision maker for the alternative not to rent additional space.

In everyday risky decision situations, RDOs are quite common. For example, people having to decide whether or not to travel into a region where an epidemic infectious disease rages, often inquire whether one can get vaccinated against that disease instead of passively contemplating probabilities. A person wanting to buy a new car but not being certain whether she can meet the monthly installments, may take out a consumer credit repayment insurance. Classifications of types of RDOs can be found in Huber (in press), Huber and Huber (2003) and Huber and Wicki (2004).

The decision process involving an RDO can be sketched as follows (e.g., Huber, in press): After an initial evaluation of the alternatives, the decision maker detects that an otherwise attractive alternative *may* also lead to a negative consequence. Now he or she has to make the process decision whether to search for an RDO or not (search decision). Some of the factors affecting the search decision are summarized in Huber (in press). If the decision maker

decided to search for an RDO and the search was successful, a second process decision has to be made: whether or not to *accept* the detected RDO. The available results concerning this topic are also reviewed in Huber (in press). If the RDO is acceptable, the decision maker chooses the alternative. If it is not acceptable then one of the decision heuristics like, for example, MAXIMIN, is applied to come to a decision (Bär & Huber, submitted for publication).

### 1.2. Variability in search for probability and in search for RDOs

The type of information a decision maker searches for is an indicator for the specific decision process involved. If the decision task is not a routine task for the participant, non-automatic processing is required in particular for the construction of the cognitive representation. Therefore, we can assume information searched by the decision makers to be relevant for their subjective cognitive representation of the decision task and thus correspond to central aspects of both the representation and the process of decision making.

In the experiments mentioned above, a large variability between quasi-realistic scenarios was found, in the search for probability information as well as the search for RDOs. For example, in the *Post*-scenario in Huber et al. (1997), only 6% of participants actively searched for probability information, in contrast to 60% in a medical scenario applied in Huber and Macho (2001). In Huber et al. (2001), more than 50% of the decision makers searched actively for RDOs in the Ticks scenario (basic condition), but no one in the Precision mechanics scenario. The reasons for these task dependent differences are not known yet. For decisions among gambles, we know that *presented* probabilities obviously are taken into account<sup>1</sup> by the decision maker but risk defusing has not been investigated in the available research. For both types of information, however, we do not have data as to how decision makers search *spontaneously* for information.

In the following we discuss situations in which the decision maker does not already definitively know (correctly or not), whether an RDO exists or whether the probability is favorable or not. Such situations are common in everyday decision processes. In such situations, decision makers can get to know this information only if they search for it. Information search entails some costs (time, effort, money, ...). Decision makers should be more likely to bear these costs if their expectation to successfully find the information is larger. We presume two types of expectations to have impact on the process decision to initiate search for an RDO or probability information, respectively: (a) the expectation to find relevant information (e.g., about

<sup>1</sup> Huber and Huber (2003) found for quasi-realistic tasks, that information about the probability of success of an RDO is taken into account if it is presented. However, if it was not presented, participants did not actively search for probability information.

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