



# In search of a preferred preference elicitation method: A test of the internal consistency of choice and matching tasks



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## ABSTRACT

The numerous reports on preference reversals in preference elicitations pose a great challenge to empirical economics. Many studies have found that different tasks may generate substantially different preferences. However, little is known about whether one task is more susceptible to preference reversals than another. Therefore, taking the preference reversals as a robust behavioral pattern, guidelines are called for to provide directions regarding a preferred preference elicitation task. This paper puts forward a new test of the internal consistency of choice and matching tasks, based on “internal preference reversals”. We replicate the preference reversal phenomenon and find a significantly higher consistency within choice tasks than within matching tasks.

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## 1. Introduction

A major problem for classical decision theory is the frequent finding of *preference reversals*, i.e., the phenomenon that the relative evaluation of two or more items by an individual depends systematically on the elicitation method used (Cubitt, Munro, & Starmer, 2004). Starting with Lindman (1971) and Lichtenstein and Slovic (1971), preference reversals have been extensively investigated in the context of lotteries (Tversky & Thaler, 1990). The early studies on preference reversals compared a choice between two gambles and the selling prices of these gambles. If a specific gamble is preferred to another, economic theory predicts that this gamble should also be sold at a higher price than the other. If someone prefers prospect A over B, one would expect that person to be willing to pay more for A too. However, it turned out that, when offering one gamble with a high probability of winning a modest amount of money (a *\$-bet*) and one gamble with a low probability of winning a relatively large amount of money (a *P-bet*), many individuals chose the first option but at the same time stated a higher price for the second one. Preference reversals were found in several other tasks as well, and in a variety of different environments (Seidl, 2002). Moreover, they were found to be persistent in repeated markets (Loomes, Starmer, & Sugden, 2010).

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Because of the robust nature of this phenomenon, alternative theories were developed to explain it (Fishburn, 1984, 1985; Holt, 1986; Karni & Safra, 1987; Loomes & Sugden, 1982, 1983; Tversky, Sattath, & Slovic, 1988). Tversky, Slovic, and Kahneman (1990) empirically tested these theories in a carefully designed experiment, and found convincing evidence in favor of a theory that drops the procedural invariance assumption (Tversky et al., 1988). They claimed that the violation of procedural invariance to a large extent explained the preference reversal phenomenon. The main causes of violation of procedural invariance are scale compatibility and loss aversion.<sup>1</sup> *Scale compatibility* means that people assign greater weight to attributes represented in units similar to those of the response variable, which can generate a large distorting influence (Borchering, Epstein, & von Winterfeldt, 1991; Delquié, 1993; Huber, Ariely, & Fischer, 2002; Tversky et al., 1988). *Loss aversion* is the phenomenon that individuals handle gains and losses as seen from a reference point differently, with losses looming larger than gains (Tversky & Kahneman, 1991, 1992).

In this paper we focus on the kind of preference reversal that is caused by differences in matching and choice tasks, because these are the two most common elicitation tasks. In a choice task, an individual has to choose one option, possibly consisting of multiple attributes, out of a set of options. In matching, one attribute in one of the options is left blank and the subject is asked to give a value for this attribute that makes him indifferent between the options. Instead of just testing for the existence of preference reversals, however, we pursue another line of research.

Since the literature on preference reversals is large, we can be confident that the task used in assessing preferences exerts a substantial influence on the outcomes (Maafi, 2011). But, even if we are certain about the existence and the causes of preference reversals, what does this imply for the practical use of different assessment procedures? Is there one task that elicits preferences more consistently than others? Indeed, while one may prefer revealed over stated preference, the latter is commonly used in situations where revealed preference data cannot be ethically or meaningfully obtained, such as in the context of health. Hence, the question of a preferred elicitation method remains pivotal.

The differences between choice and matching elicitation tasks have been investigated before (Bostic, Herrnstein, & Luce, 1990; Huber et al., 2002; Loomes, 1988; Stalmeier, Wakker, & Bezembinder, 1997). The major conclusion from these studies was that elicitation of indifferences by means of choices yields better results than indifferences obtained by matching, in the sense that series of choices generated fewer inconsistencies than matching questions (Bostic et al., 1990), although Loomes (1988) and Loomes, Starmer, & Sugden, 1989 found preference reversals for both tasks in a monetary lottery setting. Arrow et al. (1993) recommended the use of choices instead of open-ended question in contingent valuation studies, because they consider the open-ended questions not realistic and sensitive to strategic responses.

This paper seeks to extend the above research by performing a specific test of the internal consistency of choice and matching tasks. Our test relies on the observation that in tasks with two options, each consisting of two attributes, there are actually two ways to perform the matching task, and two ways to perform the choice task. These four different procedures are all *strategically equivalent*, i.e., they should generate the same preference orderings according to standard economic theory. Now, given the finding of systematically different results *between* choice and matching procedures, we can investigate the results of the two procedures *within* matching and the results of the two procedures *within* choice. This allows us to test whether choice or matching generates more inconsistencies (i.e., preference reversals) across different variations. If preference reversals are also found within methods, this seems to be an even more elementary violation. If the choice task for example generates the same results for its two strategically equivalent variants, whereas the matching task generates systematic differences, this would suggest that the former has a higher internal consistency than the latter. It is known, for instance, that the two different matching procedures cause significantly different results (Delquié, 1993).

We perform this test in a health valuation setting, where these procedures are frequently used (also to inform actual decisions). In particular, we use a time tradeoff (TTO) valuation, which is a popular method to elicit preferences for health states (Dolan, Gudex, Kind, & Williams, 1996a, 1996b; Lamers, McDonnell, Stalmeier, Krabbe, & Busschbach, 2006) and has been used to derive value sets in a number of countries, including Denmark, Germany, Japan, the Netherlands, Spain and the UK (<http://www.euroqol.org>). In short, the method asks an individual to trade off life years in order to improve health status. We use the aforementioned four procedures to test the internal consistency of choice and matching tasks in this setting.

The main contribution of this study is that it provides a criterion (internal consistency) that can be used to assess the relative performance of different elicitation methods. Although this is of course merely one out of several possible evaluation criteria, it is a first step in developing these criteria, which may help to develop more guidance in the choice between alternative elicitation methods. The results of this study are relevant for scholars as well as for budget allocations in health care and the allocation of other public resources. These allocations often rely on stated preference methods to estimate values generated by different interventions, and different elicited values can have profound consequences.

We introduce terminology and explain underlying theory in Section 2. Section 3 describes the details of our experiment. The results of the experiment are presented in Section 4. Finally, Section 5 contains a discussion of the results and concludes this paper.

<sup>1</sup> Recently, however (Butler & Loomes, 2007; Schmidt & Hey, 2004) casted doubt on the validity of the scale compatibility hypothesis and suggested that preference reversals are partly caused by a higher error frequency among pricing than among choices.

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