



The role of incentives on preference revelations in auctions versus rankings



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ABSTRACT

The literature carries an extensive account of discrepancies in preference parameter estimates across different value elicitation methods. This study provides a detailed analysis of the effect of incentive compatibility on discrepancies in reported preferences. Specifically, we construct several partial ranking models (for best and worst alternatives) and conduct various statistical tests to determine where, how, and why discrepancies occur between an incentive compatible auction and a non-incentive compatible ranking task. While most previous comparisons were done using consumer valuation, this study uses *preference orderings* to provide a more robust comparison. For this purpose, the bids reported under the auction exercise were recoded as implied ranks. Our results highlight the importance of different incentive structures on the way people report their preferences in the presence and absence of incentive compatibility. In general, individuals were following different behavioral rules to evaluate the alternatives under the two elicitation mechanisms. However, preference parameter estimates for the best and worst alternatives seem to be more immune, although for different reasons, to the effect of different incentive structures than for middle ranked alternatives. This suggests that incentive compatibility and incentive structure should not be ignored when the analysis of preferences over the middle ranked alternatives is desired.

1. Introduction

Consumer preferences have been of prominent interest in several fields. In fact, significant resources have been directed towards understanding the consumer's decision process and the factors that influence his valuation for different products and services. Furthermore, researchers have constructed and compared various value elicitation mechanisms to analyze consumer preferences. However, one issue that arises is the apparent discrepancy in the reported preferences across different value elicitation mechanisms, arriving from differences in their design, nature, and incentive compatibility (Tversky et al., 1990; Lichtenstein and Slovic, 1973; Lusk and Schroeder 2006, Berg et al., 2010). This paper is aimed at examining the effect of incentive compatibility on discrepancies in consumer preferences between different valuation mechanisms. Specifically, we analyze and compare preferences for fruit products between a non-hypothetical, incentive compatible auction and a non-hypothetical, but non-incentive compatible ranking procedure.¹

The literature carries an extensive account of discrepancies in the preferences reported under different value elicitation mechanisms. This phenomenon, which is often termed preference inconsistency, has been observed between several types of

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¹ The non-incentive compatibility of the ranking procedure is a direct result of the Gibbard–Satterthwaite Theorem, which states that any ranking mechanism with more than two alternatives is non-incentive compatible in nature (Gibbard, 1973; Satterthwaite, 1975).

mechanisms including auction versus choice (Loomes and Sugden, 1983, Su et al., 2011, Lusk and Schroeder 2006, Corrigan et al., 2009), choice versus ranking (Boyle et al., 2001), and contingent rating (CR) versus contingent valuation (CV) (Siikamäki and Layton, 2007, Su et al., 2011). Preference inconsistencies have also been demonstrated using incentive compatible and non-incentive compatible versions of those mechanisms. For instance, Berg et al. (2010) highlighted the role of incentive compatibility in changing the response pattern and decisions of individuals, while Rutström (1998) reported a divergence in behavior between different auction mechanisms even in the presence of incentive compatibility. Furthermore, Carson and Groves (2007) showed that mechanism design theory predicts that parameter estimates consistent with difference preferences will generally result from the use of different preference elicitation mechanisms, with Carson et al. (2014) providing an empirical demonstration of this prediction in the case of a binary discrete choice question.

Careful comparison of preferences between different value elicitation mechanisms has enabled researchers to propose several possible explanations for the reported preference inconsistencies. For example, Loomes and Sugden (1983) attributed the inconsistencies in preference ordering between auction/bids and choice experiments to an underlying regret-utility hypothesis. They argued that choice experiments, which require the rejection of all non-chosen alternatives, impose more cognitive dissonance on the participant. Given appropriate assumptions about the underlying utility, this might lead participants to choose an alternative with a lower bid.

Some other plausible causes of preference inconsistencies include experimental design and information treatments. Caparrós et al. (2008) argue that it is hard to discern if the inconsistencies are actually caused by the experimental design itself. In addition, it is argued that different designs stimulate different attributes of the alternatives and that confusion and misperception lead to inconsistencies especially when the participants are not well trained in advance (Lusk and Schroeder, 2006, Plott and Zeiler, 2005). On the other hand, Su et al. (2011) concluded that inconsistencies could arise from the fact that individuals don't have enough information about the alternatives. This means that providing more information could help generate more consistent preferences.

The analysis of preference reversals, a special case of inconsistency, has helped provide more insightful explanations of this behavior. According to the *New Palgrave Dictionary of Economics* (2008), preference reversal is a widespread behavioral property. It refers to situations where subjects report opposite or contradictory preferences for two alternatives when facing different elicitation methods or contexts.

A sizeable portion of the literature has been directed towards the analysis of preference reversals (Grether and Plott, 1979, Holt, 1986, Tversky and Thaler, 1990). One of the predominant causes of this phenomenon, often argued by researchers, is the change in consumers' views at different stages of the decision process. For example, Tversky et al. (1988) argued that participants weighed the attributes lexicographically, which caused them to switch their preferences between stages. Alternatively, Mellers et al. (1992) asserted that changes in the way attributes are combined, for example additively or multiplicatively, resulted in significant discrepancies which gave rise to inconsistencies. Finally, Goldstein and Einhorn (1987) attributed preference reversals to changes in how a formed valuation is expressed or translated into a response.

Despite the wide literature on preference inconsistencies, there are some incidents where preferences were shown to be similar across different valuation mechanisms (Caparrós et al., 2008; Harrison and Rutström, 2006). Harrison and Rutström (2006), for example, examined individual preferences for mortality risk and found them to be consistent under an incentivized and a non-incentivized version of a ranking mechanism. It is worthwhile to note that while Harrison and Rutström (2006) used an incentivized ranking procedure as the incentive compatible mechanism, our study uses the implied rankings from an incentive compatible auction to be compared with a non-incentive compatible ranking procedure.

Several partial rankings have been previously used to elicit consumer preferences including top ranks, bottom ranks and best-worst ranking (Böckenholt, 1992; Pavan and Todeschini, 2004; Hensher and Ho, 2016). On the other hand, researchers have also studied consumer preferences under various types of auction mechanisms including Dutch auctions, English auctions, Vickrey first-, second-, and nth price auctions, and Becker et al., 1964 (BDM) auctions (Katok and Roth, 2004; Rutström, 1998; Kagel and Levin, 1993, Shogren et al., 2001, Lusk, 2003). In this regard, Rutström (1998) found behavioral differences between various incentive compatible auctions. She argued that reported bids in the English auction were lower and had significantly less variance than the ones in Vickrey auctions. She also found that the elicited bids in the BDM auction differed from the ones in Vickrey and English auctions.

An 11th price sealed bid Vickrey (1961) auction was used as the incentive compatible mechanism in this study, which was compared with a non-incentive compatible ranking procedure.² As detailed later in the paper, the mechanisms were designed to be equivalent in almost all aspects besides incentive compatibility. The comparison was conducted using several top (best) and bottom (worst) partial rankings in order to determine where, how, and why the discrepancies arise between the two valuation mechanisms. While most comparisons have focused on the actual consumer valuation, like willingness to pay, our study uses consumer *preference orderings* to explore this issue (i.e., is the most preferred option the same across the elicitation mechanisms? what about the second best option, or the worst?). This was done by recoding the bids in the auction into implied rankings. By using ordinal data, we comply with the notion of an ordinal utility measure, which allows for a more robust comparison.

We find evidence that individuals employ different behavioral rules under the two elicitation mechanisms, especially when expressing mild feelings about certain alternatives (middle rankings). Although the experimental design tried to align the incentives

² Although the incentive compatibility of this auction format has been theoretically proven, it is important to mention that empirical deviations from theory have been reported for this auction format (Shogren et al., 2001). Moreover, while it can be more difficult and confusing to explain to the subjects than the second price auction (Shogren et al., 2001; Jaeger et al., 2004), it discourages overbidding as the subjects have a higher probability of purchasing the product in an nth price auction.

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