Chapter 3
Strategic Diffusion of Information and Preference Manipulation

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ABSTRACT
This paper bridges the existing gap between the empirical consumer choice literature and the theoretical structures built to account for information manipulation between a sender and a decision maker. The authors define a theoretical structure that allows for the analysis of preference manipulation in multiattribute environments via information multifunctions when the information transmitted is verifiable. A series of examples are provided that illustrate numerically the behaviour and validity of this theoretical structure. A concrete application of this theoretical framework is the possibility for an information sender to induce any predetermined preference relation on a decision maker, and, in particular, how lexicographic preferences can be induced starting from non-lexicographic additive ones.

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INTRODUCTION
The dispersion of information among different sources constitutes an important economic phenomenon whose study was introduced by Stigler in 1961. Stigler states that no one knows all the prices that various sellers quote at any given time, and that such price dispersion reflects the ignorance existing in the market. Besides, he shows that the search process of decision makers (economic agents) for the expected minimum price exhibits diminishing returns. While prices are directly observable, other characteristics defining the overall quality of goods require consumption. Search processes are therefore defined by price and experience components, the latter requiring
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the actual consumption of the good to be observed (Nelson, 1970). These two uncertainty levels allow for the design of optimal search mechanisms based on standard dynamic programming techniques. Wilde (1980) derives an optimal algorithmic structure in such a setting, where repurchasing options become available after a time delay generated by the consumption process. The temporal cost required to verify experience components limits endogenously the amount of observed characteristics per purchase. Such a theoretical environment is partially reflected in the current empirical literature on consumer choice.

The empirical and experimental literature on consumer choice deals currently with multiattribute goods and the influence of increasingly larger information sets on preferences and choice. The lack of a well-defined set of preferences allows for the choice context to influence final choices, and several manipulative effects on preferences have been identified in the literature. Among them, we emphasize the asymmetric dominance effect due to Huber et al. (1982), who found that adding an option dominated by only one alternative in the original choice set can increase the preference for the dominating option. In a related setting, Hamilton et al. (2007) showed that intuitive choice processes are indeed affected by perceptually similar options. Moreover, Novemsky et al. (2007) illustrate how the construction of preferences is subject to modifications by third-parties through context effects: increasing the subjective difficulties found by consumers when forming their preferences, without modifying the attributes of the choice objects, or the choice sets themselves, leads to an increase of deferral and compromise effects. Finally, Diehl (2005) finds that the screening tools used in electronic shopping to facilitate choices in unordered environments degrade the quality of choice in ordered ones. When used in ordered environments, these tools decrease the average quality of the choice set and lead the attention of decision makers towards the more mediocre options.

The psychological and context based approaches defined by the previous papers constitute the qualitative side of any search and evaluation process. Bounded rationality principles outline the main empirical findings of a complementary quantitative side. Building on the work of Slovic and MacPhillamy (1974), who showed that decision makers weigh more heavily commonly known characteristics than unknown ones, Kivetz and Simonson (2000) find that choosing from sets with missing information affects the tastes of decision makers and their purchase decision, leading to intransitive preferences. It therefore follows that the information given to decision makers can be strategically designed such that some predetermined options appear more attractive to them. In particular, an increase in the amount of superfluous information presented to decision makers would decrease their ability to make good decisions, see the corresponding literature cited in Ariely (2000). At the same time, while controlling the flow of information should help decision makers match their preferences better, it would also increase the demand on the cognitive capacities required to process the additional information obtained (Ariely, 2000). Indeed, the existing tradeoffs between information acquisition costs and the progress achieved during the search process should define the stopping criteria of decision makers. Saad and Russo (1996) found an effort-reducing heuristic in search processes, where decision makers stop searching after all attributes in a predetermined set of core attributes have been acquired. They show that this heuristic decision rule is stronger when agents control the order in which information is acquired, that is, the information flow.

The findings reported by the previous literature should lead to a theoretical re-examination of the basic bidimensional search models of consumer choice. Some initial theoretical attempts at modeling multidimensional search environments in consumer choice were made by Moorthy et al. (1997), who studied how prior beliefs affect the