



Heuristics and resource depletion: eye-tracking customers' in situ gaze behavior in the field



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ABSTRACT

When we visit a retail outlet, we go there to complete some type of shopping goal. These goals may be very specific and precisely planned prior to entering the store, or more abstract, and something we think of on the spur of the moment. The stores may display tens of thousands of different products, making it difficult to achieve the shopping goal in a rational manner. As a result, we use different types of heuristics to meet our shopping goals. In this study, we investigate how a customer's visual attention is influenced by their shopping goal, based on the results of three field experiments in three different contexts—a gas station, a sports store, and a grocery store. Firstly we establish that differences do exist in viewing behavior based on whether shopping goals are planned or unplanned. A more complex and unplanned shopping goal leads to increased observations of in-store stimulus. We then study whether or not the complexity of the first shopping goal also influences the viewing behavior of the next shopping goal, independently of the characteristics of the second goal. The findings confirm that complex decision heuristics deplete cognitive recourse. This finding results in diminished visual attention during subsequent choices. In turn, this has implications for a customer's shopping behavior.

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1. Introduction

A successful trip to a store may be regarded as the completion of a series of shopping goals. These goals may be set before the shopping trip starts, or realized during the visit to the store (Inman, Winer, & Ferraro, 2009; Park, Iyer, & Smith, 1989). Either way, the completion of a goal, or series of goals, entails picking products that fulfill the current needs and wishes of the shopper. The goals themselves also differ in terms of their specificity, ranging from selecting a particular product of a specific brand to a more general goal, such as acquiring something to quench a suddenly thirst, or finding food items that could be a meal for a family. Even though goals may be specific and articulated before the store visit in the form of a shopping list, up to an estimated 80 percent of the final decisions are made in front of the store shelf (POPAL, 1996). Given the large number of products in any given section of a supermarket, a customer cannot evaluate the strengths and merits of

all available options. Instead, customers utilize some type of simplifying strategy, or heuristic, to narrow their visual attention, look at only a subset of the available products, and then make the choice in a fast and efficient manner; or, as Woodside, Krauss, Caldwell, & Cheba (2007, p. 17) state: 'Choices are created spontaneously as a result of subconscious heuristic processing, not as a result of the calculated pursuit of previously existing goals or preferences'.

In fact, customers often make product choices within seconds (Judd, Aalders, & Melis, 1988) and only consider a limited number of options before they make a choice (Hoyer, 1984; Nedungadi, 1990) and the selected option receives little visual attention during in-store decision making (cf. Otterbring, Wästlund, Gustafsson, & Shams, in press). As customers also make multiple choices one after the other, the question then becomes: what consequence does the use of one heuristic have on the up-coming choices? Specifically this question is important as the cognitive effort differs from one heuristic to another, hence influencing the depletion of cognitive resources. Although a few studies have explored visual attention during the process of choosing products from a shelf (e.g., Russo and Leclerc (1994)), no previous studies have investigated the effects of decision heuristics on visual attention during the choice process in a real store. There is probably no existing research that explores the relationship between heuristics decision making and resource depletion and the influence of this relationship on visual attention during the decision-making process. Understanding cognitive

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limitations is central to both theory and practical applications in consumer decision-making, because a better awareness of limitations would help us to understand information and choice overload (Johnson, 2008).

To fill this gap, the present study explores this relationship in three field experiments in different contexts by manipulating shopping tasks to influence heuristics decision making and resource depletion. Furthermore, process measures are used by measuring consumers' visual attention throughout the decision-making process. The purpose of the sequence of field experiments is as follows.

In the first field experiment, carried out at a gas station, we explored if there are differences in viewing behavior based on whether the customer has a pre-planned or unplanned (buy something that is not planned) shopping goal. The results from this field experiment suggest that customers seem to use different types of heuristics as a consequence of task specificity.

In the second field experiment, which was completed in a sports store, we drew on theories of heuristic decision making and resource depletion to compare decisions based on the take-the-best heuristic with regard to the selection of a specific pre-planned product. After completing the first task, we then studied its effect on a subsequent unplanned choice. The results show that the use of the take-the-best heuristic is more demanding and results in a more distributed gaze pattern. In support of the resource depletion theory, the results also show that take-the-best leads to a reduced gaze pattern during the subsequent choice.

This effect is reversed in the third field experiment that was carried out in a large food store. In this field experiment the selection of a pre-planned product was compared with a choice based on the satisfaction heuristic. In this case, a non-specific shopping goal resulted in less visual attention than a specific pre-planned shopping goal did. However, in support of the resource depletion theory, and consistent with the second field experiment, it was found that more visual attention on an initial choice task depletes resources on a second choice task.

1.1. Theoretical framework

The consumer choice process is most commonly viewed as a multi-stage process (Andrews & Srivivasan, 1995). Although there is a considerable variation in the number of proposed stages, the lowest common denominator is the notion that consumers screen and evaluate the alternatives before entering the choice stage (Bettman, Luce, & Payne, 1998; Shao, Lye, & Rundle-Thiele, 2008). During the initial screening phase, consumers gather information regarding the available options, and start eliminating inappropriate alternatives (Andrews & Srivivasan, 1995; Wedell & Senter, 1997).

The consideration phase follows the screening phase. In the consideration phase, the consideration set, a subset of the available alternatives (Payne, 1976), is actively evaluated (Bettman et al., 1998; Johnson & Payne, 1985). The consumer evaluates the products included in the consideration set and narrows the choices down to what is often described as the choice set (Roberts, 1989; Russo & Leclerc, 1994), repeating the process until only one final product remains. In many cases, however, customers do not go through one single choice process, but make several subsequent choices one after the other. This is typical for any trip to a grocery store. Earlier laboratory studies have shown that making a series of active choices leads to the depletion of resources. This makes people more susceptible to emotionally-laden product features (Bruyneel, Dewitte, Vohs, & Warlop, 2006), and more prone to impulse buying (Vohs & Faber, 2007). Resource depletion has also been shown to increase reliance on intuitive thinking at the expense of a more cognitively demanding consideration (Pochepstova, Amir, Dhar, & Baumeister, 2009).

Russo and Leclerc (1994) suggested that the choice process is viewed as a series of evaluations, comparisons, and eliminations that result in a single remaining alternative. Interestingly, in this process

customers actually do not look at all of the available options (Russo & Leclerc, 1994). Needless to say, a product cannot be selected unless it has actually been looked at. If customers view a greater selection of products, it follows that more products have a possibility of being included in the consideration set. Other studies have explored such findings. The research of Chandon, Hutchinson, Bradlow, & Young (2009) shows that any given product has an approximately 70 percent likelihood of being noted. In relation to the research topic, including more options leads to a more demanding decision effort, and a customer will have to work harder to come up with a solution.

1.2. Heuristic decision making

Also central to the field of heuristic decision making is the use and evaluation of decision cues. Instead of making a rational and formal choice based on all available information, Goldstein and Gigerenzer (1999) argued that the choice process is based on different heuristics, making the process swift and effective. They furthermore proposed that people have an adaptive toolbox of different types of heuristics and that, depending on the situation, different heuristics are used to solve the problem (Gigerenzer & Gaissmaier, 2011). The most basic heuristic is the recognition heuristic (Goldstein & Gigerenzer, 1999), which simply states that, given a choice between two options in which one is recognized and one is not, the recognized one is preferred. If a person recognizes more than one option, these options are evaluated according to the fluency heuristic (Jacoby & Dallas, 1981), which uses the speed of memory retrieval as a cue to compare the degree of familiarity. In both cases, the more familiar option is evaluated more favorably. These results also confirm the findings of Shams, Wästlund, & Witell (2012) that indicate that product familiarity is an important driver of visual attention.

In more complex situations involving several options, the decision is not based on recognition alone, but also involves the creation of decision criteria and the evaluation of cues. If the objective is to choose any product that meets a minimum requirement level, the satisfaction heuristic might be used (Simon, 1955; Todd, 1999). In contrast, if the objective is to select an option with the highest conformance to the decision criteria, the take-the-best heuristic (Gigerenzer & Goldstein, 1969) may be used to select the option that meets the highest-ranking unique criteria; alternatively the tallying heuristic (Dawes, 1979) may be used to select the option that meets the most non-ranked decision criteria.

Next, we will describe the three field experiments and what we tried to solve in each experiment.

2. Field experiment one: influence of shopping goal on breadth of visual search

The research on heuristic decision making shows how consumers can use fast and efficient decision strategies to solve the goals of their shopping trip. However, it is important to discriminate between goals that were set before the trip to the store and goals that arose during the visit. Planned purchases are the result of shopping goals that stem from needs that are recognized before the visit to the store (Bucklin & Lattin, 1991). In contrast, unplanned purchases are the result of shopping goals that stem from needs that were unrecognized before the shopping event (Park et al., 1989). These two conditions represent two different types of challenges. If we know what we are looking for before entering the store, the goal is to search for a specific target, or something we recognize as a solution to our current need. This should be easier compared with the more complex problem-solving process of setting goals and evaluating possible solutions at the same time. The first experiment is carried out in order to understand if a planned shopping process leads to a different search pattern compared with an unplanned shopping process where the goals are realized in the store. The primary aim of the first field study is to explore the influence of the shopping goal on the breadth of in-store visual search. The assumption is that consumers with predefined shopping goals display a narrow

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