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Do you like what you see? The role of first fixation and total fixation duration in consumer choice

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ABSTRACT

Although there has been recent growing interest in the associations between measures of visual attention and consumer choice, there is still uncertainty about the role of the first fixation in consumer choice and the factors that drive total fixation duration. The study aimed (1) to investigate the influence of the first fixation on consumer choice, and (2) to disentangle two factors driving total fixation duration, namely preference formation (the process of establishing a preference for one of the items of the choice set) and the decision goal (task instruction). Participants chose between two products while their eye movements were measured. To investigate the influence of first fixation location on choice, first fixation location was manipulated in half of the trials. To disentangle effects of preference formation and the decision goal, participants selected either the product they wanted, or the product they did not want. Our findings showed that manipulating the first fixation towards an alternative did not influence its likelihood of being chosen. Although total fixation duration was mainly determined by the decision goal, it was also influenced by preference formation. The results provide important implications for the interpretation of eye tracking results and in-store marketing.

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Introduction

It is generally known that a product has to be noticed on the shelf for it to have a chance of making it into the shopping basket. Consequently, commercial interest in the role of visual attention in consumer choice is growing.

Commonly reported measures of visual attention in consumer research are the location of the first fixation and also total fixation duration, which is the total duration of all fixations on a specific stimulus (Peschel & Orquin, 2013; Reisenberg, 2013). Factors influencing visual attention are commonly distinguished by bottom-up and top-down processes (Corbetta & Shulman, 2002). Bottom-up, or stimulus-oriented, attention refers to attention captured by visual saliency (e.g., color, contrast), surface size, visual clutter and location. The effect of visual saliency on attentional capture in consumer choice situations is well established: visually more salient advertisements and news articles are looked at longer and are more likely to be fixated on first, compared to less visually salient alternatives (Lohse et al., 1997, Bialkova & Van Trijp, 2011; Navalpakkam, Kumar, Li, & Sivakumar, 2012; Orquin, Mueller-Loose, & Scholderer, 2013). Top-down, or goal-oriented, attention refers to the voluntary allocation of attention and causes people to direct their attention to the objects that are most informative for their current goal or task. Examples of top-down factors in consumer choice situations are influences of pre-existing preferences, personal goals (e.g., the goal to eat healthy) and task instruction (in market research) on visual attention (Corbetta & Shulman, 2002; Rayner, Miller, & Rotello, 2008).

Down-stream effects of visual attention on consumer choice have gained much interest recently (Orquin & Mueller-Loose, 2013). Down-stream effects refer to causal effects of visual attention on decision-making. For example, it has been shown that manipulating the fixation duration towards an alternative can increase its likelihood of being chosen (Armel, Beaumel, & Rangel, 2008; Shimojo, Simion, Shimojo, & Scheier, 2003). A recent







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review suggested that attention might influence choice by three potential mechanisms: (1) by a mere exposure effect, (2) by limiting the decision to fixated alternatives, and (3) by increasing the influence of fixated alternatives (Orquin & Mueller-Loose, 2013). However, a lot remains unclear about down-stream effects. For example, it has been repeatedly shown that people have a choice bias towards visually salient alternatives that are also likely to be looked at first. Yet, the causal effect of the first fixation location on consumer choice was never tested and is thus still unknown. Secondly, looking longer at chosen items (often referred to as 'gaze bias' (Schotter, Berry, McKenzie, & Rayner, 2010)) in consumer choice situations is often attributed to down-stream effects of fixation duration (i.e., gaze allocation that accompanies preference formation: the process of establishing a preference for one of the items of the choice set, Krajbich, Armel, & Rangel, 2010; Shimojo et al., 2003), while it might also be caused by processes of topdown attention, such as pre-existing preference or decision-goals (Orquin & Mueller-Loose, 2013).

In the present study we aim to clarify the role of the first fixation location in consumer choice and to explain how decision-goals and preference formation influence the gaze bias for chosen alternatives. The following sections will elaborate on these two issues.

The role of the first fixation in down-stream effects on consumer choice

Packages are designed to catch your eye. As previously mentioned, visual salience captures attention more readily: visually salient items are more likely to be looked at first and they are looked at longer (Lohse et al., 1997; Navalpakkam et al., 2012). It has been shown that choices can be influenced by manipulating visual characteristics of a package, such that it 'pops out' (e.g., Milosavljevic, Navalpakkam, Koch, & Rangel, 2012). However, it is unknown through which mechanisms this occurs. Whereas a higher visual saliency could result in a higher likelihood that the product is the first to catch the eye (location of first fixation), it could also retain attention to this item (i.e., longer total fixation duration) and thereby increase preference (Bialkova & van Trijp, 2011: Kraibich et al., 2010: Lohse, 1997: Navalpakkam et al., 2012; Orquin et al., 2013). Moreover, the visual manipulation itself (making a package brighter/darker) could also influence preference by increasing attractiveness (Van der Laan, De Ridder, Viergever, & Smeets, 2012). While down-stream effects of attention on choice can occur via fixation duration (Armel et al., 2008; Shimojo et al., 2003), much less is known about the role of the first fixation.

Multiple models of visual attention in decision-making suggest that the location of the first fixation plays an important role in the decision-process. Studies concerning the gaze cascade effect and down-stream effects of visual attention on decision-making (Armel et al., 2008; Shimojo et al., 2003), have suggested that gaze allocation both reflects and influences preference through preferential looking and mere exposure respectively. Therefore, an alternative that is first looked at has an initial advantage through the mere exposure effect (Simion & Shimojo, 2006). Evidence accumulation models (e.g., the drift diffusion model, Krajbich et al., 2010) assume that evidence in favor of an alternative is accumulated during fixations. The decision is made when the accumulated evidence passes a certain threshold towards one of the alternatives. Therefore, Krajbich and colleagues (2010) posit that the alternative looked at first should have an advantage over the other alternative because initially more evidence is accumulated. Orguin and Mueller-Loose (2013) propose that the first fixation itself might not influence preference for an item but that that fixations driven by visual salience might influence choice by the process of gatekeeping: visually salient items are more likely to attract fixations and to enter the consideration set (the items that are under consideration for choice), while less visually salient items fail to capture attention and do not enter the consideration set and therefore are less likely to be chosen.

Although evidence accumulation models and the gaze cascade effect suggest an important role for the location of the first fixation, (i.e., the models predict that the alternative that is looked at first would be more likely to be chosen), empirical results on the association between first fixation and choice are mixed: some studies have shown that people are more likely to choose the item that they fixated on first (e.g., Glaholt & Reingold, 2011; Krajbich et al., 2010; Schotter et al., 2010) while other studies (e.g., Armel et al., 2008) have found no association between first fixation location and choice. Some authors have proposed that the location of the first fixation is influenced by top down effects of pre-existing preferences (e.g., for palatable high energy foods, Werthmann, Mogg, Bradley, & Jansen, 2011), while others posit that the location of the first fixation is mainly driven by factors that are uncorrelated with value, such as visual attributes (e.g., Bialkova & van Triip, 2011; Lohse, 1997; Milosavljevic et al., 2012; Navalpakkam et al., 2012; Wolfe & Horowitz, 2004), the place on the shelf (Chandon, Hutchinson, Bradlow, & Young, 2009), cultural norms (e.g., reading from left to right, Krajbich et al., 2010), or a person's decision goal (e.g., to identify the most effective versus the most liked advertisements, Rayner et al., 2008). Thus, it is unknown whether the first fixation indeed has a causal (down-stream) effect on choice, as the decision-making models described above would suggest.

To our knowledge no previous studies have experimentally investigated whether consumer choice can be influenced by manipulating the first fixation to a product. Therefore, our first aim was to investigate whether manipulating the first fixation towards an alternative increases its likelihood of being chosen. Investigating the influence of the first fixation on choice is relevant because it will elucidate how irrelevant cues (e.g., location on the shelf) can affect choices.

Disentangling the effects of decision goals and preference formation on the gaze bias for chosen alternatives

Several studies have shown that the ultimately chosen alternative is looked at longer (Atalay, Bodur, & Rasolofoarison, 2012; Chandon et al., 2009; Russo & Leclerc, 1994; Schotter et al., 2010). This phenomenon has been referred to as the 'gaze bias' (Schotter et al., 2010). The earlier mentioned models of visual attention in value-based decision making (Gaze cascade model, Shimojo et al., 2003; Simion & Shimojo, 2006; Evidence accumulation models, Krajbich et al., 2010) attribute the gaze bias towards chosen alternatives to a down-stream effect of fixation duration on choice, i.e., fixating longer on an alternative increases preference for it. These models attribute fixation duration solely to the build-up of preference or evidence for the stimulus that is fixated on. Preference formation is the process of establishing a preference for one of the items of the choice set. Basically, it involves establishing the value of the items in the choice set, and comparing them in order to reach a decision (e.g., Shimojo et al., 2003). The gaze bias for chosen alternatives is thought to reflect fixations accompanied by the process of preference formation. However, eventual selection of the item on which total fixation duration was longest is not specific for value-based decision making. It also occurs in perceptual decision making (Glaholt & Reingold, 2009a, 2009b, 2011), in which it is attributed to top-down factors such as the decision goals that results from a specific task instruction (e.g., Yarbus, 1967). For instance, when the decision goal is to indicate the roundest face from a range of faces, subjects look longer at the roundest face (Shimojo et al., 2003; Simion & Shimojo, 2006). Similarly, when the goal is to evaluate the healthiness of products, health logos are looked at longer (Orquin & Scholderer, 2011). Since it is not likely that total fixation duration is instigated by Download English Version:

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