Journal of Retailing and Consumer Services 28 (2016) 165–170

Contents lists available at ScienceDirect

Journal of Retailing and Consumer Services

journal homepage: www.elsevier.com/locate/jretconser

Eye-tracking customers' visual attention in the wild: Dynamic gaze behavior moderates the effect of store familiarity on navigational fluency

Tobias Otterbring [a,*], Erik Wästlund [a], Anders Gustafsson [b,c]

[a] Department of Psychology & CTF – Service Research Center, Karlstad University, Universitetsgatan 2, SE-65281 Karlstad, Sweden
[b] Department of Marketing & CTF – Service Research Center, Karlstad University, Universitetsgatan 2, SE-65281 Karlstad, Sweden
[c] Department of Marketing, BI, Norwegian Business School, Nydalsveien 37, NO-0442 Oslo, Norway

ARTICLE INFO

Article history:
Received 3 February 2015
Received in revised form
19 September 2015
Accepted 20 September 2015

Keywords:
Eye tracking
Visual attention
Navigation
Navigational fluency
Store familiarity
Field study

ABSTRACT

A retail store is a multi-sensory environment filled with messages to tempt customers into making unplanned purchases. The purpose of this field study was to examine the interplay between three factors claimed to precede and influence unplanned purchases: store familiarity, visual attention, and navigational fluency (the subjective ease of navigating). Eye-tracking recordings and post-study questionnaires from 100 grocery store shoppers showed that store familiarity was positively associated with navigational fluency. However, customers' levels of dynamic gaze behavior (a frequent, widely distributed viewing pattern) moderated this effect. Dynamic gaze behavior significantly predicted navigational fluency among customers with low and moderate store familiarity, but not among customers familiar with the store. These findings challenge the formerly held assumption that store familiarity automatically implies navigational ease, and store unfamiliarity implies navigational difficulty. The results have implications for navigational aspects in stores.

1. Introduction

Approximately 80% of a shopper's in-store time is spent navigating, and the remaining 20% is spent deciding which items to purchase (Sorensen, 2009). The present research focuses on the 80% of time when customers navigate through the store. In today's retail environment, one type of in-store stimulus that customers frequently encounter during navigation is digital signage – screens displaying digitally linked messages, advertisements, and promotions. According to the Outdoor Advertising Association of America (Outdoor Advertising Association of America, 2007), the number of digital signs in the United States will increase by approximately 900% within 10 years. The digital signage market is projected to generate 15 billion USD in revenue in 2016 (Want and Schillit, 2012), and retailers spend millions of dollars each year on distributing and monitoring in-store signage stimuli (Kiran et al., 2012). This development is not surprising given the positive effects of signage on recall and recognition of advertised brands and products, as well as on brand familiarity and purchase intentions (Yim et al., 2010). Studies further suggest that digital signage leads to increased consumption, higher levels of approach behavior (drawing customers towards merchandise), and a more favorable shopping atmosphere.

Signage stimuli are also crucial to customers' initial impressions of their physical surroundings (Bitner, 1992), and facilitate their navigation (O'Neill, 1991); therefore, customers are highly likely to be exposed to and influenced by such stimuli during navigation. In support of this notion, in-store stimulus exposure during navigation is considered a main contributor to unplanned buying behavior (Park et al., 1989). However, the results of existing research are inconsistent.

Iyer (1989) and Park et al. (1989) found that customers who visited a store where they had not previously shopped made significantly more unplanned purchases when available shopping time was unlimited. This was because they relied more on in-store stimuli such as signage material. Customers with limited knowledge of the store's layout would be more likely to direct their attention towards in-store cues than customers who are familiar with the store. The latter group does not need to rely on such stimuli to navigate around the store, or to find products or store sections.

On the other hand, Inman et al. (2009) found that store

* Corresponding author.
E-mail addresses: tobias.otterbring@kau.se (T. Otterbring), erik.wastlund@kau.se (E. Wästlund), anders.gustafsson@kau.se (A. Gustafsson).

http://dx.doi.org/10.1016/j.jretconser.2015.09.004
0969-6989/

familiarity had a significant positive effect on unplanned purchases. They concluded that store-familiar customers (customers familiar with the store) had a greater ability to use the store environment to guide their shopping needs. Without having to spend time and effort on search activities, store-familiar customers would use in-store stimuli for purposes other than navigation. Therefore, exposure to such stimuli would have a stronger influence on their decision-making.

The main objective of this field study was to investigate the interplay between three factors that tend to precede and influence unplanned purchases: store familiarity, visual attention, and navigational fluency (the subjective ease of navigating in a particular area). Iyer (1989), Park et al. (1989), and Inman et al. (2009) relied on these factors to interpret and discuss their findings. Although they used customers' presumed different levels of, and needs for, search activities to explain unplanned buying behavior, they never explicitly measured visual attention or navigational ease.[1] Instead, they measured familiarity with the store environment, which was defined as the number of times that customers shopped in a particular grocery store. This measure was then used to infer that store familiarity would translate into navigational ease, and store unfamiliarity into navigational difficulty. However, these claims were unexplored, and cannot be taken for granted.

2. Theory and hypotheses development

Store-familiar customers are better at identifying their location in the shopping environment (Dogu and Erkip, 2000; Titus and Everett, 1996), and therefore should find the search process less cognitively demanding than store-unfamiliar customers (Inman et al., 2009; Park et al., 1989). Consequently, store-familiar customers should be more likely to report navigational fluency. Research on processing fluency (the relative ease of processing information) support this reasoning by showing that familiar stimuli are more fluently processed than new stimuli (Jacoby and Dallas, 1981; Weaver et al., 2007; Winkielman et al., 2003). In addition, a large body of research in the areas of environmental psychology, architecture, marketing, and consumer behavior has consistently indicated that familiarity improves a person's performance in navigational tasks (Chebat et al., 2005; Dogu and Erkip, 2000; Gärling et al., 1983; Hölscher et al., 2006; O'Neill, 1992; Prestopnik and Roskos-Ewoldsen, 2000; Titus and Everett, 1995, 1996). Therefore, we hypothesize:

H1. : *Store-familiar customers are more navigationally fluent than customers who have lower levels of store familiarity.*

Previous studies on navigation have typically overlooked aspects such as processing visual information regarding the environment (Spiers and Maguire, 2008). Despite this lack of research, visual attention can be assumed to have a positive effect on navigational fluency. Even though this effect should be more pronounced among customers with lower levels of store familiarity (as described in H3), it is reasonable to think of navigational fluency as being partly determined by the amount of attention people pay to stimuli in their surrounding environment. A more dynamic gaze behavior (a frequent, widely distributed viewing pattern) with more visual attention towards various in-store cues should result in more fluent navigation (and vice versa). Accordingly, we hypothesize:

H2. : *Customers with dynamic gaze behavior are more navigationally fluent than customers with lower levels of dynamic gaze behavior.*

However, due to the knowledge possessed by store-familiar customers regarding store layout, floor configurations, and product locations (Park et al., 1989), visual attention should be less important for their navigational fluency than it is for customers who are unfamiliar with the store. The latter group of customers must pay more attention to visual in-store cues, and therefore should display a more dynamic gaze behavior in order to successfully navigate through the store (for example, see Titus and Everett (1995)). People unfamiliar with a place primarily use external sources of information (such as visual stimuli) in their navigation, whereas those familiar with the environment rely more heavily on their internal long-term memory (Chebat et al., 2005; Gärling et al., 1983). In addition, unfamiliar stimuli elicit more attentional orienting than familiar stimuli do (Desimonde et al., 1995). Therefore, we hypothesize:

H3. : *The assumed effect of store familiarity on navigational fluency (H1) is moderated by customers' levels of dynamic gaze behavior. Store-familiar customers are navigationally fluent, independent of dynamic gaze behavior. Conversely, dynamic gaze behavior has a significant positive impact on navigational fluency among customers with lower levels of store familiarity.*

3. Methodology

We measured visual attention by eye tracking, which is less influenced by response bias than self-reporting is, and has a more standardized way of investigating cognitive processes than memory-based measures (Krajewski et al., 2011). Eye tracking is also one way of collecting detailed data about a customer's search behavior (Shankar et al., 2011). To record participants' eye fixations (the points at which the eye fixates upon an object and acquires information) (Russo, 2011), we used a head-mounted eye-tracking system (Tobii glasses), which look similar to a regular pair of glasses. The sampling frequency was 30 Hz (Tobii Eye-Tracking Research, 2012). In addition to the eye-tracking recordings, we obtained data from post-experiment questionnaires.

3.1. Participants

The sample consisted of 100 shoppers (61 male) at a grocery store. Participants with *z*-scores more than 2 standard deviations above or below the mean on the visual attention measure were treated as outliers ($n=8$), and were excluded from the dataset (for instance, see Mussweiler and Strack (2000) and Otterbring et al. (2014)). After completing the session, which lasted approximately 10–15 min, participants were given a lottery ticket (valued at approximately 2 USD), and were offered a 5% discount off all food they purchased in the store that day.

3.2. Design, stimuli and procedure

The study used a quasi-experimental design. All customers were given an overview of the study's purpose, including the stated aim of investigating how visual attention is directed when completing an ordinary shopping task. The shopping task, referred to as the *shopping-list procedure*, served as a cover story. It was also designed to maximize the probability that participants took approximately the same route around the store, and were exposed to an equal number of digital signs (for a similar approach, see Titus and Everett (1996)).

At the store entrance, each customer was fitted with a pair of

[1] Admittedly, Iyer (1989) and Park et al. (1989) partially covered the navigational aspects of the shopping experience with a manipulation check.