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Consumer processing of mobile online stores: Sources and effects of processing fluency

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ABSTRACT

This research explores the role of processing fluency perceptions in consumer experiences of mobile online shopping. Processing fluency refers to the ease with which information is processed, and plays a pivotal role in the short, interactive sessions that characterize interactions with mobile devices. The findings from two empirical studies suggest that perceived visual complexity reduces fluency perceptions, while perceived visual congruence (between the mobile online store and the conventional, computer-accessible online store) has the opposite effect. No differences were found in the effects of visual congruence perceptions between mobile shopping touchpoints. Processing fluency, in turn, positively affects both satisfaction with the mobile online store and choice satisfaction.

1. Introduction

Online stores can be accessed through an increasing number of electronic channels (i.e. e-channels)[1] (Wagner, 2015; Wagner et al., 2016). In addition to Internet-enabled computers (e.g. desktop PCs), mobile devices (i.e. smartphones and tablets) offer access at all times and in all places (Groß, 2016). Mobile online stores provide consumers with the opportunity to perform shopping-related tasks during the pre-purchase, transaction, and post-transaction stage (Holmes et al., 2014). Hardware, software and network improvements mean that mobile devices are increasingly used for such tasks (eMarketer, 2016) (Fig. 1).

Current studies demonstrate that retailers should focus their attention on promoting mobile online shopping. Both Huang et al. (2016) and Wang et al. (2015) found that the consumers who adopt mobile devices for online transactions spend more. As consumer satisfaction represents a focal antecedent to loyalty (Bitner, 1990), there is a growing need for practitioners and academics to understand the factors that foster and strengthen consumer satisfaction resulting from mobile online shopping. Hew (2017) notes a significant lack of research in this regard. Shankar et al. (2016) encourages researchers to shed light on consumer experience of mobile online shopping because positive experiences enhance, among others, consumer satisfaction (Morgan-Thomas and Veloutsou, 2013). Therefore, this research illuminates consumer experience of mobile online shopping and, more specifically, consumers' perceptions of processing fluency during mobile online shopping. Processing fluency is generally understood as the ease with which a stimulus or an experience (e.g. mobile online store use) is processed; it is a metacognitive cue that accompanies human thought processes and prepares judgements (Alter and Oppenheimer, 2009). Since processing ease is positively marked (Winkielman and Cacioppo, 2001), it seems to be a reasonable starting point for creating a positive retail experience (e.g. Orth and Wirtz, 2014). Given the aforementioned nature of mobile device use, perceived processing fluency might play a pivotal role as a metacognitive experience that creates an agreeable shopping experience. Channel-specific particularities and their impact on consumer responses and behaviour further justify a targeted view of consumer experience of mobile online stores (e.g. Riquelme et al., 2016; Wagner, 2015). Unlike an Internet-enabled computer use, mobile use is characterized by short, interactive sessions that are subject to various situational distractors, including poor lighting and tiny input functions (Oulasvirta et al., 2012). Several studies indicate that the characteristics of these electronic devices impact how consumers perceive and interact with online content (Brasel and Gips, 2014; Ghose et al., 2013; Koenigstorfer and Groeppel-Klein, 2012). Despite these important device-related qualities, current research often neglects to specify the e-channel that consumers use to perform online transactions (e.g. Riquelme et al., 2016).

Against this backdrop, this study develops a comprehensive model

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[1] Here, an e-channel refers to a "category of Internet-enabled devices [...] that consumers can use to interact with and purchase from an online retailer" (Wagner, 2015). An e-channel touchpoint refers to a specific shopping format (e.g. a mobile shopping app) that retailers can use to promote their products and services (Wagner, 2015).

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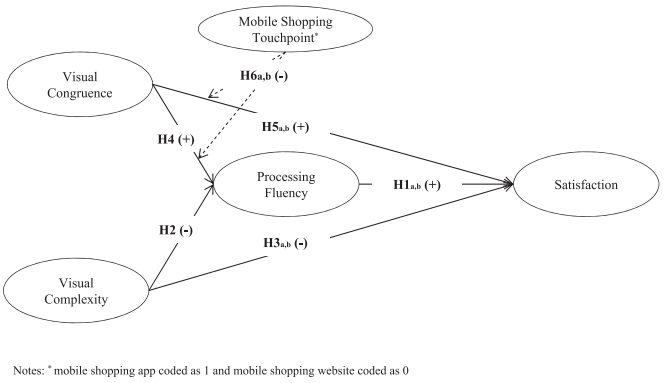

Fig. 1. Conceptual Model.

of the sources and effects of perceived processing fluency during mobile online shopping. Based on affect-as-information theory (Schwarz, 1990), this research aims to examine the predictive power of processing fluency on experience outcomes. Specifically, it addresses the following question: *How does perceived processing fluency impact consumers' responses?* Its antecedents are examined in terms of environmental theory (Mehrabian and Russell, 1974) in order to understand consumers' perceptions of visual design parameters, and to analyse their influence. This leads to the following, secondary question: *How do consumers' perceptions of mobile online store visual design enable or inhibit their perception of processing fluency?* Finally, and to broaden the perspective on the sources of processing fluency, the study sheds light on situational parameters that moderate consumers' perceptions of the mobile store environment and addresses a third question: *To what extent do situational parameters moderate consumers' perceptions of the mobile online store environment?*

This study contributes to the current body of literature on consumers' information processing in online retail environments (e.g. Mosteller et al., 2014). Scholars have paid little attention to how information and visual design cues provided by online stores affects visitors. Although extant research demonstrates that the screen size of the device on which information are displayed influences human information processing (Reeves et al., 1999), scholars fail to shed light on how consumers process information presented on mobile devices. Mobile devices are typically equipped with relatively small screens on which information are presented. Hence, compared to other electronic devices (e.g. computers), mobile devices might cause specific mechanisms of information processing (Kahn, 2016). Moreover, existing research into processing fluency has only considered either inhibitors (Wu et al., 2016) or enablers (van Rompay et al., 2010) of fluent information processing. Unlike earlier work, this research examines both, in order to understand the balance between them. Drawing upon current work on channel congruence (Badrinarayanan et al., 2014), this study introduces the concept of visual e-channel congruence and tests its predictive power. Situational variables are also central in this research, as they contribute to understanding heterogeneity. In turn, these variables are useful for marketers as they help to explain the purchase funnel, from online store information to consumer responses, in more detail. This research further contributes to the literature on mobile online shopping. Prior work has focused on exploring acceptance of mobile devices for online shopping (e.g. Hung et al., 2012) without examining the consumer experience of mobile online shopping. Initial work reveals that satisfaction positively influences reuse intentions of mobile online shopping (Agrebi and Jallais, 2015; Thakur, 2016). This study goes one step further, by analysing the drivers of consumer satisfaction. Such research is particularly valuable for marketers, as satisfaction affects both customer loyalty (Bitner, 1990) and firm value (Luo et al., 2010).

2. Conceptual framework and hypotheses

2.1. Perceived processing fluency

Processing fluency refers to the ease with which information is brought to mind (Schwarz, 2004) or with which "externally presented stimuli are processed" (Novemsky et al., 2007). It is a metacognitive experience (Alter and Oppenheimer, 2009) that accompanies human thought processes and judgement. In general, theories of human judgement assume that individuals do not exclusively evaluate environmental stimuli on the basis of declarative information (Schwarz, 2004), and suggest that metacognitive experiences help to form an overall opinion. Objective processing fluency refers to mental processes characterized by high speed, low demands on resources, and high accuracy (Winkielman et al., 2003); subjective processing fluency refers to an individual's experience of fluency (i.e. processing ease, low effort, high speed), which "is felt at the periphery of conscious awareness" (Herrmann et al., 2013).

The concept subsumes mental processes at different levels (Reber et al., 2004). This view has led to the differentiation of aspects of processing fluency (for an overview, see Alter and Oppenheimer (2009)). Perceptual fluency, for instance, summarizes the ease with which a stimulus's physical properties can be detected, while conceptual fluency refers to the ease with which a stimulus's meaning with respect to existing knowledge structures can be identified (Lee and Labroo, 2004). Consistent with prior work (Winkielman et al., 2003), this research adopts a comprehensive understanding that captures both perceptual and conceptual fluency. Therefore, in the context of this research, processing fluency refers to the subjective ease of mentally processing a mobile online shopping experience.

2.2. Effects of perceived processing fluency

While internal, meta-cognitive feedback mechanisms provide signals to other systems, such as the affect system (Fernandez-Duque et al., 2000), processing fluency directly affects human experience and judgement. It is related to achieving goals and "indicates the availability of appropriate knowledge structures to deal with the current situation" (Winkielman and Cacioppo, 2001). The authors find that processing fluency is positively marked and induces immediate positive reactions, which are attributed to the local stimulus (Reber et al., 2004). People consider the properties of a stimulus, and the accompanying feelings (e.g. perceptions of processing fluency) in making a judgement (Schwarz and Clore, 1983). Following the affect-as-information model, humans evaluate the feeling associated with processing a stimulus as information about the stimulus itself (Schwarz, 1990).

Various studies have demonstrated the positive valence of processing fluency. For instance, Lee and Labroo (2004) found that a product that comes easily to consumers' minds creates more favourable judgements than products that are hard to process. In the retail context, Orth and Wirtz (2014) found that service environments that are easy to process increase the store's perceived attractiveness and indirectly affect patronage. In the online context, Im et al. (2010) came to a similar conclusion: perceptual fluency enhances perceived pleasure during online shopping, which in turn increases patronage and purchase intentions. Similarly, Mosteller et al. (2014) report that online stores with a high level of perceptual fluency enhance pleasure, while simultaneously reducing the cognitive effort associated with evaluating products.

Although its relevance to managers means that user satisfaction plays a pivotal role in website evaluation (McKinney et al., 2002), prior research has not examined the effect of processing fluency on consumer satisfaction. Overall, satisfaction can be viewed as an object-based attitude (Wixom and Todd, 2005). In information system research, attitudes are described as a "predisposition to respond favourably or unfavourably to a computer system, application [...] or a process