DEFINING BOUNDARIES OF WEB ADS’ PERCEPTUAL FLUENCY EFFECT: COGNITIVE RESOURCES AND PRESENTATION FORMATS

Research-in-Progress

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Abstract

Recent studies have observed the perceptual effect of peripherally displayed web ads on consumers’ online shopping behavior. This study examines how an individual’s disposition in cognitive operations - need for cognition (NFC), interacts with web ad presentation formats to influence the functioning of the perceptual fluency effect. It integrates web ad literature with the persuasion knowledge model and proposes that the perceptual fluency effect would be more likely to occur at the unconscious level for high-NFC consumers exposed to low-visibility ad and for low-NFC consumers exposed to high-visibility ad. When high-NFC individuals exposed to high-visibility ad, they would engage in conscious processing of the ad. This would allow them to identify the relationship between the ad and their primary shopping task and infer the potential influence of the web ad on their behavior. They may avoid its influence, leading to attenuated perceptual fluency effect.

Keywords: Persuasion knowledge, unconsciousness, advertisement presentation, perceptual fluency, online advertising
Introduction

Mary is choosing a restaurant for dinner from a few options that all meet her basic criteria on a web page. Peripherally on the same page, a static ad of one of the options is displayed. Would her choice be affected by this web ad? Further, what would be the case if the ad is displayed in a more dynamic and visible presentation format?

The web has evolved into a prominent shopping platform and a mainstream advertising medium. In 2012, digital advertising revenues climbed to a milestone high of $36.6 billion (PriceWaterhouseCooper 2013). With marketers’ rising ad dollars on the web, the Internet has grown into a complex shopping environment. Mary’s experience is not uncommon - consumers are increasingly exposed to web ads displayed peripherally when processing product information during online shopping. As consumers tend to avoid and neglect web ads (Dreze and Husssherr 2003), marketers attempt to increase ad salience through selective ad deployment. Based on real-time analysis of consumers’ shopping behavior, marketers can display contextually targeting web ads that match consumers’ primary shopping tasks (Goldfarb and Tucker 2011, Moe 2013). The product under consideration and the web ad displayed can thus be linked with some physical features such as product brand and logo.

While prior research has examined the congruity between the primary task and the web ad, the primary focus was on assessing whether the match can enhance the processing of the ad (Moore et al. 2005). Recent studies have investigated web ads in the broader shopping context they are embedded in and generated empirical supports for their effects on consumers’ primary online shopping behavior. For instance, through a large scale field survey, Goldfarb and Tucker (2011) have found that exposure to peripherally displayed ads increased the likelihood of the advertised products to be included in the consideration set for future consumptions. In experiments, Wang and Teo (2012) have observed that people’s product choices were affected by the features of the web ads they had been exposed to. The influences of web ads, which could hardly attract significant visual and cognitive attention, on consumers’ behavior pertaining to their primary shopping tasks could be explained by processing fluency effects.

Processing fluency is a metacognitive state that one may experience when engaging in various cognitive activities such as reasoning and decision making. When it occurs, one’s cognitive operations are affected by not only the information available but also the ease of the information comes to mind (Schwarz 2004). As processing fluency can result in a positive feeling which is also incorporated into cognitive operations (Lee 2004, Schwarz 2004), one often exhibits heightened evaluation and increased preference of the fluent target.

Processing fluency is often an outcome of exposure to subtle contextual stimuli (Berger and Fitzsimons 2008, Dijksterhuis et al. 2005). Such exposure can increase the accessibility of some features or concepts related to the contextual stimuli. One will experience processing fluency when dealing with another target that is somehow linked to those features and concepts (Berger and Fitzsimons 2008, Shapiro et al. 1997, Shapiro and MacInnis 1992). Perceptual fluency is an important type of processing fluency. It operates at the perceptual level such that one’s exposure to environmental stimuli results in the assimilation of their physical features (e.g., shape, color, brand, logo, etc), which in turn facilitates one’s processing of another object with the same physical features (Jacoby and Dallas 1981; Shapior 1999). For instance, Berger and Fitzsimons (2008) have documented that the color of the pen that people used for answering survey questions led them to choose more products of that color. Specifically, participants who used a green (orange) pen chose more products associated with green (orange) such as Lemon-Lime Gatorade (Sunkist orange soda). Marketers are often encouraged to employ the perceptual fluency effect by embedding ads in relevant shopping contexts as they can unknowingly influence consumers’ behavior when they focus on their primary shopping tasks (Shapiro and Nielsen 2013).

However, although studies have generally attested to the perceptual fluency effect in the online context, there are inconsistencies that need investigation and reconciliation. Specifically, Goldfarb and Tucker (2011) have documented that while contextually-targeting web ads could increase purchase likelihood, presenting them in highly visible dynamic formats would negate their effects. Instead, Wang and Teo
(2012) have reported that web ads affected product choice when they were displayed in a dynamic flash fashion. The different observations highlight there could be unexamined variables that account for the differential operations of the perceptual fluency of web ads under varying levels of visibility of the ads.

The current study pursues this direction. It examines how an individual’s disposition in cognitive operations - need for cognition (NFC), interacts with web ad presentation formats to influence the functioning of the perceptual fluency effect. To this end, we depict the boundaries of web ads’ perceptual fluency effect by explicating when it is more vs. less likely to occur.

Drawing on prior literature on web ads, we argue that the perceptual fluency effect takes place outside of online consumers’ awareness at the unconscious level. If consumers’ cognitive resources and ad presentation formats enable them to raise suspicion of the online marketer’s motive of using web ads to influence their shopping decisions, they may exhibit cognitive and behavioural reactance and purposefully correct the potential influence. Consequently, the perceptual fluency effect would vanish. We adopt the persuasion knowledge model (PKM) (Friestad and Wright 1994) to theorize the diminishing perceptual fluency effect. The PKM postulates that consumers possess a system of knowledge about marketing persuasions. This knowledge enables them to identify how, when, and why marketers try to influence them. It also helps them to respond to the influence. Consumers are more likely to use of the persuasion knowledge when the ulterior persuasive motive is accessible and when they have sufficient cognitive resources capacity (Campbell and Kirmani 2000). We propose that high NFC individuals with more cognitive resources, as opposed to low NFC individuals, are more likely to activate persuasion knowledge when exposed to attention-getting web ads that are delivered with highly visible presentation format, which in turn leads to weakened perceptual fluency effect. To test our propositions, we have conducted a pilot study and are designing and developing another two experiments.

Theoretical Foundations

Perceptual Fluency Effect of Web Ads and its Unconscious Nature

Stimuli surrounding an individual can produce ease of information processing when the individual encounters another object that contains those stimuli (Bargh and Chartrand 2000; Shapiro 1999). The contextual stimuli, although are not the object of attention, can leave memory traces. When the individual processes the focal object, its features related to those stimuli will be more accessible, resulting in processing fluency (Berger and Fitzsimons 2008). Processing fluency is often accompanied by a positive feeling (Lee 2004). As suggested by the “feeling-as-information” proposition (Schwarz 2004), individuals often “use the valence of their feeling to infer the direction of their attitudes and preferences” (Pham 2004, p. 362). Thus, the positive feeling induced by fluent processing of the focal object leads one to generate more positive evaluation of and favorable attitude to the fluent object. Processing fluency can be strengthened through increasing the frequency of exposure to contextual stimuli (Berger and Fitzsimons 2008). Frequent exposures can repeatedly prime the features in the stimuli, leading them to be more accessible when the individual deals with the focal target. Processing fluency often occurs at the perceptual level when the physical and outer identify, form and features of contextual stimuli such as brand, logo, color, etc. are assimilated into one’s cognitive system and result in ease of processing (Schwarz 2004; Shapiro 1999). For instance, exposure of a picture containing a product’s logo may lead one more likely to choose that product (Shapiro and Nielsen 2013).

The fluency effect takes place outside of one’s awareness at the unconscious level (Kunst-Wilson and Zajonc 1980, Shapiro 1999). Unconscious influences are characterized as “a lack of awareness of the influences or effects of a triggering stimulus and not of the triggering stimulus itself” (Bargh and Morsella 2008, p. 75). The occurrence of processing fluency hinges on interactions of the neurons associated with the primary object and the neurons activated by contextual stimuli (Fitzsimons et al. 2002).

Neural nodes and links underlie various cognitive activities. Different concepts are represented as nodes in the brain. Cognitive processes involve the activation and interaction of numerous nodes (Anderson 1983). When dealing with their primary tasks, people’s attention is directed to the information related to
the tasks and contextual stimuli receive only casual attention. Such selective attention controls people to engage in conscious processing of the information of the object (Baars and Franklin 2007) and reduce the resources available to consciously process secondary information associated with contextual stimuli. The conscious process entails the activation of the nodes representing object-related information. In the meantime, casual and brief exposure to contextual stimuli leaves memory traces, which in essence are the activation of various nodes representing those stimuli in the brain. Fluency effect occurs when these nodes connect to and interact with those associated with the focal object, leading one’s processing of the object’s information to be affected by the contextual stimuli (Rumelhart and McClelland 1982).

Online shopping involves intensive information processing. Consumers evaluate products by scrutinizing different product information such as attributes, descriptions, images, and reviews, etc., presented on e-commerce websites. Meanwhile, with the rapid development of e-commerce, marketers increasingly advertise on the web. Although they may not focus their attention on web ads (Dreze and Husssherr 2003, Shankar and Hollinger 2007), their incidental exposure to the ads may activate the nodes related to the various features of the ads. When a product under consideration has the same features as contained in the web ads, the corresponding nodes previously activated by the ads become easily accessible, leading to fluent processing of the product. This fluent cognitive operation will then result in higher evaluation of and more favorable attitude to the product. Empirically, studies have found that mere exposure to the web ad of a particular color theme led consumers to be more likely to choose the same color for their products (Wang and Teo 2012). The perceptual fluency effect could be increasingly prevalent on the web given the trend that marketers match web ads with the products that consumers are searching and viewing (Moe 2013).

The perceptual fluency effect of web ads also operates at an unconscious level. Although online consumers are aware of the web ads presented peripherally, they do not engage in conscious processing of those ads. Studies have documented online ad exposure improves implicit, instead of explicit, memory performance, indicating that web ads are processed unconsciously (Yoo 2007, 2008). Further, consumers are unaware that their judgment and behavior are influenced by the web ads peripherally displayed (Wang and Teo 2012). Given consumers’ unawareness of the influences of web ads, stimuli in the web ads are able to slip below the level of their defenses, shaping cognitive operations and leading to behavioural changes unconsciously. However, unconscious effects often vanish if individuals suspect that there could be a connection between the context and their behaviour (Williams et al. 2004). In our context, when consumers engage in mindful and conscious processing of the stimuli in the web ad and raise suspicion about their potential effects, perceptual fluency effect may disappear.

The Persuasion Knowledge Model

The persuasion knowledge model (PKM) offers the insight into the underlying psychological process that causes the differential effects of markets’ persuasive attempts. The model posits that over time, individuals develop a set of intuitive theories and beliefs about various persuasive episodes in both social and commercial contexts. The persuasion knowledge enables consumers to identify a persuasion agent’s persuasion motives (e.g., persuading someone to do something such as buy a product to increase sales) and tactics (e.g., threatening or flattery) (Friestad and Wright 1994). The activation of persuasion knowledge during a persuasive episode increases individuals’ vigilance, leading them to suspect that the persuasion agent attempts to influence their attitudes and decisions with manipulative and unfair means. Such suspicion will in turn dampen their attitude to the agent, making the influence attempt less effective.

Although everyone has an accumulative set of persuasion knowledge, the extent to which people tap into the knowledge during persuasive episodes and adapt evaluations and decisions accordingly may vary. The operation of one’s persuasion knowledge to influence the coping with the persuasion agent is affected by the accessibility of the agent’s ulterior motive and the availability of one’s cognitive resources (Campbell and Kirmani 2000).

Attention-getting Tactics and Activation of Persuasion Knowledge

Activation of persuasion knowledge depends on the accessibility of the persuasion agent’s ulterior motives. Although most marketing persuasion attempts are driven by the ultimate goal of influencing consumers’
attitudes and behaviors, how manipulative the marketers’ tactics are and how easily consumers can perceive the underlying manipulative intents and ulterior motives vary. Whereas some marketing tactics exert subtle influence, intense competition and the clutter of marketing communications propel marketers to use aggressive attention-getting tactics to attract attention and increase processing (Campbell 1995). However, increases of attention and processing may lead consumers to second guess the marketers by considering why they have used the particular way of delivering their messages and what objectives they intend to achieve. Thus, use of attention-getting tactics may prompt consumers to infer that the marketer is attempting to manipulate or unfairly persuade consumers (Campbell 1995).

In the online shopping context, marketers adopt various techniques to display web ads. Web ads become increasingly dynamic and visible by including many visual and audio features that make them hard to ignore (Goldfarb and Tucker 2011). However, using attention-getting tactics to display web ads can be a double-edged sword. On one hand, it may foster the perceptual fluency effect of web ads. As the web is a more goal-oriented medium compared to traditional marketing communication media such as TV and newspaper (Eighmey 1997), most consumers are preoccupied with their primary shopping tasks when visiting the web. Thus online consumers tend to ignore web ads when they are of low visibility. Consumers’ visual attention to the web ad would increase when it is delivered in some more salient formats such as flash, pop-up, in-stream video and audio, interactive ad, and floating ad (Goldfarb and Tucker 2011). Increased exposure to the web ad could strengthen the memory traces, promoting its intervention in one’s cognitive operation.

On the other hand, web ads with high visibility can produce stronger explicit memory, indicating that consumers are likely to process them attentively and mindfully (Goldfarb and Tucker 2010). According to PKM literature, such increased attention and processing may activate persuasion knowledge and lead consumer to analyze why the web ads are displayed in the particular way. If consumers identify the potential links between web ads and the focal products and suspect that their product preferences and choices could be affected by the ads, consumers may treat the ads as a persuasive agent attempting to control their behavior. This reasoning could attenuate the perceptual fluency effect of web ads. However, engaging in the above reasoning requires substantial cognitive resources. Thus, the availability of cognitive resources is another important precondition for persuasion knowledge to operate.

**Availability of Cognitive Resources and Activation of Persuasion Knowledge**

Inferring the persuasion agent’s ulterior motives involves a higher-order cognitive process to reevaluate and correct the automatic and perceptual impression formed during the initial interaction with the agent (Gilbert and Malone 1995). For instance, when a consumer is considering a product in a store, the strong recommendation from the salesperson may lead the consumer to generate favorable product. In this context, the activation of persuasion knowledge model entails the consumer to analyze that the salesperson’s remarks may just be motivated by the desire to sell the product. This additional correction process requires greater cognitive capacity than does the automatic impression formation (Gilbert et al. 1988). When cognitive resources are constrained, one would rely only on shallower cognitive processing of the information presented by the persuasion agent and could not engage in deeper cognitive processing and use persuasion knowledge to take into account underlying persuasion motives.

Varying situational factors (e.g., shopping tasks and environments) consume differential amount of cognitive resources, resulting in different resource constraints for people to activate persuasion knowledge (Campbell and Kermani 2000). However, when situation factors are held constant, one’s personal disposition in information processing may play a key role. The disposition influencing the depth of one’s information processing can be reflected by need for cognition (NFC) (Tam and Ho 2005).

Cohen et al. (1955) originally conceptualized NFC as “a need to structure relevant situations in meaningful, integrated ways. It is a need to understand and make reasonable the experiential world” (p. 291). Cacioppo and Petty (1982) extended this definition to more general settings to reflect an individual’s “tendency to engage in and enjoy thinking” (p. 119). Studies have consistently observed behavioural differences between high and low NFC individuals as a result of their differential tendencies to organize, elaborate on, and evaluate the information they are exposed to. Tam and Ho (2005) summarized that, compared to low-NFC ones, high-NFC individuals tend to incorporate more information when making
decisions (Verplanken 1993), engage in more effortful processing of persuasive messages (Areni et al. 2000, Roehm and Sternthal 2001), enjoy more effortful cognitive tasks (Larsen et al. 2004), and develop more complex causal explanations for the behaviour of others (Fletcher et al. 1986), and devote more topic-relevant thoughts to persuasive communications (Cacioppo et al. 1983, Haugtvedt et al. 1992). These behavioural differences demonstrate that high-NFC individuals tend to expend more cognitive resources than low-NFC individuals to process information.

Research Hypotheses

Integrating PKM with the literature on the perceptual fluency effect of web ads, we posit that attention-getting tactics such as highly visible ad presentation formats would interact with the consumer’s NFC to influence the perceptual fluency effect of web ads. Our general proposition is that when the ad’s visibility is low, high-NFC consumers are more likely to experience perceptual fluency. When visibility of the ad increases, low-NFC individuals are more likely to experience perceptual fluency. In contrast, high visibility presentation and high-NFC ones’ abundant cognitive resources would lead to mindful and conscious processing of the web ad and the activation of persuasion knowledge. Consequently, high-NFC individuals are more likely to infer the ad may have a manipulative effect on their behavior and avoid its influence.

Web ads of low visibility can hardly attract focused attention and processing. However, short and brief exposure to the low visible ad could produce differential effects on consumers depending on their NFC levels. Research has consistently documented that high-NFC individuals are able to achieve in-depth information processing as they expend significantly more cognitive resources than low NFC ones (Tam and Ho 2005). While the majority of cognitive and behavioural tendencies observed in high-NFC individuals involve conscious processes such as engaging in more effortful cognitive tasks (Larsen et al. 2004) and developing more complex causal explanations for the behaviour of others (Fletcher et al. 1986), it also implicates that their mental systems tend to recruit, activate, and integrate more neural nodes during information processing. Such active mental systems could increase the probability that the nodes processing the focal online product connect to and interact with the nodes associated with the static web ad. Hence, high-NFC individuals’ would be more likely to experience perceptual fluency when processing the primary shopping task (e.g., product evaluations and purchase decisions) whose certain features match the static web ad. In contrary, low-NFC individuals are characterized as devoting relatively limited cognitive resources to information processing. This mental operation habit may result in constrain for their cognitive resources to be stimulated by the static web ad. Even when stimulated, the cognitive resources may not be active enough to interact with the processing of the focal product.

\[ H_1: \text{When exposed to a static web ad, consumers with high NFC, as opposed to low NFC, are more likely to experience perceptual fluency such that they will choose the product that matches the web ad.} \]

When deployed with attention-getting tactics, the web ad becomes difficult to ignore and is able to attract increased visual attention. Prior research has found that highly visible ads lead to heightened recall performance, an important indicator of conscious information processing (Goldfarb and Tucker 2010). Thus, heightened attention would instigate conscious processing of the web ad. This would render the nodes associated with the ad more active and increase their connection to the nodes pertinent to the primary shopping task, leading one to perceive the product matching the ad as a fluent object.

However, for high-NFC individuals, the inclination to the product matching the ad may be overridden by the suspicion of the manipulative intent of the ad. Sufficient cognitive resources supply, coupled with increased attention to and processing of the ad, could enable high-NFC individuals to identify the relationship between the ad and certain features of the fluent product and infer that such a relationship could possibly affect their decisions pertinent to the product. This reasoning process may then increase their vigilance and trigger them to reconsider their evaluations and decisions regarding the product. Thus, the increase in the visibility of web ads will not lead to a heightened effect of perceptual fluency for high-NFC individuals. Instead, it may activate their inference of the manipulative influence of the ad, which consequently attenuates the perceptual fluency effect.

On the contrary, for low NFC individuals, more active nodes associated with the web ad resulting from increased visibility of the ad heighten the probability that they connect to the nodes related to the primary
shopping tasks, leading to the occurrence of perceptual fluency effect. However, as their information processing tends to be shallow due to limited cognitive resources available, low-NFC individuals would not be able to engage in the high-order cognitive process of analyzing the potential influence of the ad on their product evaluation. Instead, they may only perceive the fluency and make decisions accordingly.

**H2:** When exposed to a dynamic web ad, consumers with low NFC, as opposed to high NFC, are more likely to experience perceptual fluency such that they will choose the product matching the web ad.

**H3a:** When exposed to a dynamic web ad, consumers with high NFC, as opposed to low NFC, are more likely to infer the persuasive intent of the web ad.

**H3b:** Inference of the persuasive intent of the web ad mediates the effects of consumers’ NFC on product choice when the web ad is presented in a dynamic format.

### Experiments

#### Pilot Study

A small-scale pilot study was conducted to test our propositions preliminarily and to examine the adequacy and appropriateness of experimental design and stimuli. We created a hotel booking website for the pilot study. The participants were told that they would be going on an overseas trip and need to book a hotel on the website. There were four hotel packages that satisfied their basic criteria (e.g., price, location, etc.). The hotels were presented in a random order. The participants were asked to book one that they preferred the most. The hotel packages had comparable prices and amenities but with different promotional offers. One offer was manipulated as the perceptual link to the web ad. The manipulated one offered a tourist pass allowing the holder to take free public transportation during the stay in the city. A web ad of tourist pass was displayed in either a static or flash mode (see Figure 1a&1b for experimental manipulations).

64 university students participated in the one factorial experiment (presentation: static vs. dynamic). On arriving at the lab, subjects completed a questionnaire collecting their demographic data (e.g., gender, ages, etc.) as well as NFC disposition. NFC was measured with the instrument from Cacioppo and Petty (1982) (e.g., *I would prefer complex to simple problems*, *I like to have the responsibility of handling a situation that requires a lot of thinking*, etc.). They next were given the hotel booking instruction and randomly assigned to the two presentation treatments. After they had decided on their preferred hotel, they completed another questionnaire checking the manipulations (whether they saw any web ad on the website and whether they felt the web ad annoying and intrusive) and capturing their product knowledge, etc. It should be noted that we did not measure subjects’ inference of the manipulative intent of the ad. Thus the experiment allowed us to test H1 and H2 only.
Results of manipulation and control checks were satisfactory. The assessment of NFC scale supported its reliability. Thus each subject’s scores were averaged to form his/her NFC score.

We conducted both logistic regression analysis and chi-square test. The logistic regression analysis with presentation format (treated as a binary variable) and NFC (treated as a continuous variable) as IVs and subjects’ hotel choices as DV (treated as a binary variable and coded as 1 if the target hotel was chosen or 0 if other hotels were chosen) indicated a significant interaction effect between presentation format and NFC (see Table 1).

Table 1. Pilot Study Results – Logistic Regression Test

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>P-value (value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>29.24</td>
<td>14.57</td>
<td>4.03</td>
<td>0.045</td>
</tr>
<tr>
<td>Presentation format</td>
<td>-9.72</td>
<td>4.53</td>
<td>4.59</td>
<td>0.032</td>
</tr>
<tr>
<td>NFC</td>
<td>-7.59</td>
<td>3.98</td>
<td>3.64</td>
<td>0.057</td>
</tr>
<tr>
<td>Presentation format*NFC</td>
<td>2.496</td>
<td>1.23</td>
<td>4.12</td>
<td>0.042</td>
</tr>
</tbody>
</table>

To better interpret the interaction effect, we conducted Chi-square test. We used the mean of the obtained average NFC score to split the subjects into low and high NFC groups. Thus there were 16 subjects in each condition cell. The results as shown in Table 2 indicate that when the web ad was static, high-NFC subjects were marginally more likely to choose the hotel matching the ad than low NFC ones (12.5% vs. 37.5%, $\chi^2 = 2.667$, p=0.10). Presenting the ad in the flash format led to more low-NFC subjects to choose the matching hotel (12.5% vs. 50%, $\chi^2 = 5.236$, p=0.022). The number of high-NFC subjects choosing the matching hotel decreased slightly but the change was not significant (37.5% vs. 25%, p>0.1).

Table 2. Pilot Study Results – Chi-square Test

<table>
<thead>
<tr>
<th></th>
<th>Static Ad</th>
<th>Flash Ad</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hotel w/ tourist pass offer</td>
<td>Other hotels</td>
</tr>
<tr>
<td>Low-NFC</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>High-NFC</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

The results of the pilot study supported H2. We propose two reasons why the results only supported H1 marginally. First, inadequate subject number could forbid us from getting significant evidence for the perceptual fluency effect of low-visibility web ads on high-NFC subjects’ decisions. Second, the perceptual links between the ad and the product may not be strong enough. In our study, there were only two words (tourist pass) linking the hotel and the ad. This is much weaker than those stimuli used in prior studies on the perceptual fluency effect such as large size product pictures (Shapiro et al. 1997, Shapiro and Nielsen 2013). These limitations, together with the lack of measurement of the inference of manipulative intent of the web ad, will be addressed in our formal studies.

Design of Future Experiments

Two experiments testing our research hypotheses are under design and development.

Experiment 1 extends the pilot study. Subjects will be asked to complete the same hotel booking task. The booking website will be refined with two improvements. First, its functionality will be enhanced with tracking features to determine which web page each subject visits and how long he/she stays with the page. The browsing behavior data could provide further evidence for the perceptual fluency effect as we expect subjects would be more likely to visit and spend longer time with the page of the product that matches the ad perceptually when the perceptual fluency effect occurs. Second, the perceptual link between the ad and the product will be strengthened. A transport pass picture will be included in the ad as well as displayed next to the hotel with the tourist pass offer. The experiment will largely follow the procedure of the pilot study. Subjects first complete a questionnaire on their demographic information and NFC disposition. Next, they visit the booking site and choose a hotel. Then they complete another questionnaire checking manipulations and controls and probing their perception of the effect of web ad on their choice, etc. More importantly, the questionnaire includes the scale measuring their inferences of manipulative intent of the web ad (the web advertisement tried to persuade people in an inappropriate manner, the web
advertisement tried to manipulate the online shoppers, the web advertisement seemed to be trying to inappropriately manage or control the consumer, the web advertisement tried to persuade by a manipulative means) adapted from Campbell (1995) and Kirmani and Zhu (2007).

Experiment 2 furthers the test in a few ways. First, tasks and ads are changed. Subjects will be asked to choose a cereal from a set of brands on a web page and the ad of one brand is displayed in either static or dynamic format. Second, we will manipulate the busyness of subjects' cognitive operations at high vs. low level. In the high busyness condition, subjects will be asked to memorize the nutrition information of the cereals they have viewed, in addition to choosing a cereal brand. In the low business condition, subjects will just perform the basic cereal selection task. Hence, experiment 2 has a 2x2 between subject design (presentation: static/dynamic, busyness: low/high). Our expectation is that performing the memorizing task would consume significant cognitive resources and therefore mute the contributions of cognitive resources in both low and high NFC subjects. Cognitive resource constrain would cause the perceptual fluency effect to vanish for low-NFC individuals exposed to the dynamic ad and for high-NFC individuals exposed to the static ad. For high-NFC individuals exposed to the dynamic ad, reduced supply of cognitive resources would limit their ability to identify the relationship between the focal product and the ad and therefore inhibit them from engaging in deeper processing and activating persuasion knowledge. They would instead perform low-order cognitive operations and blend the ad with their cereal evaluation and selection. Hence, we expect to observe the perceptual fluency effect in high-NFC individuals exposed to the dynamic ad in the high busyness condition. Experiment 2 will improve the robustness of the findings obtained in experiment 1 with different products and ads. It can also demonstrate that cognitive resources interact with the presentation format to influence the perceptual fluency effect of the web ad.

Discussions of Contributions and Implications

The perceptual fluency effect of web ads provides electronic commerce practitioners and marketers with a new strategy of designing and deploying web ads to influence online consumers’ shopping behaviors and to increase the effectiveness of wed ads. However, a successful implementation of this strategy in practice may require a further understanding of the operating conditions of processing influence fluency effects. In other words, a better knowledge of conditions under which processing fluency effects operate or attenuate is necessary. To this end, the current research extends the literature of the perceptual effect of web ads by investigating its conditional boundaries. Additionally, it also enhances the PKM literature by applying it to online shopping contexts and identifying the effect of a chronically and situationally stable personal dispositional construct – NFC in persuasion episodes. The study also has important implication to e-commerce practitioners and web marketers by helping them understand the conditions under which they can employ perceptual fluency to shape consumer behavior.

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