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RESEARCH ARTICLE

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Effects of the number of advertised brands in a choice set: A metacognitive process

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Abstract

When product shelves feature more advertised brands, such that the choice set likely contains some familiar options, this subjective experience of familiarity could influence consumers' evaluations of chosen products and shopping experiences, through a metacognitive process. The findings of this study suggest that (a) a product shelf displaying some advertised brands, as opposed to no advertised brands, generates greater subjective familiarity, more favorable attitudes toward the purchased items, more shopping satisfaction, and greater intentions to revisit the store; and similarly, (b) a product shelf displaying more, as opposed to fewer, advertised brands generates greater subjective familiarity, more favorable attitudes toward the purchased items, more shopping satisfaction, and greater intentions to revisit the store. These outcomes result from a three-step metacognitive process, whereby the subjective familiarity triggered by the presence of advertised brands influences judgments, through the effect of shopping pleasure. These results are robust for high- and low-involvement products, as well as in contexts in which the prices of the advertised brands are higher than, lower than, or the same as those of the nonadvertised brands.

KEYWORDS
advertising exposure, decision fluency, familiarity, metacognition, processing fluency, product display

1 | INTRODUCTION

The value and utility of advertising have been widely explored. For example, money spent on advertising has positive utility for brands, because it improves quality perceptions (Moorthy & Zhao, 2000), increases brand awareness (Clark, Doraszelski, & Draganska, 2009), and generates higher brand equity (Yoo, Donthu, & Lee, 2000). Advertising is valuable for consumers too. Regardless of the format (e.g., commercials, Internet ads, and mobile ads), consumers find value in advertising, because it provides useful product information and can be pleasant to view (Cheng, Blankson, Wang, & Chen, 2009; Ducoffe, 1995; Pollay & Mittal, 1993). Exposure to advertising also can spark a sense of subjective familiarity when consumers encounter advertised brands later, though little prior literature investigates the possible positive function of this prior exposure (i.e., remembering seeing products being advertised) for products displayed on store shelves. The current study addresses this unique potential value of advertising.

In particular, metacognition might reveal and explain the potential utility associated with perceiving brands in a choice context. Because people rely on not only the contents of their thoughts but also their subjective experience of the thought process to make judgments (Schwarz, 2004), a shelf that features more advertised brands, such that the choice set appears more familiar, may create a positive sense of familiarity, which in turn might lead consumers to misattribute their positive subjective feelings to their evaluations of the chosen product or their shopping experience. Metacognition research suggests that familiar objects are easy to perceive, and this processing fluency provides judgmental inputs (e.g., Schwarz, 2004, 2015). This study goes further, to argue that the

metacognitive influences of familiar brands on judgments are not necessarily mediated by decision fluency. Rather, by disentangling the influence of subjective familiarity from that of decision fluency, it becomes clear that more familiar brands in a choice set may increase subjective familiarity while simultaneously decreasing decision fluency. The former effect, related to perceived familiarity—but not the latter effect of decision fluency—then exerts influences on consumers' judgments and choices.

Two metacognitive processes might account for the influence of subjective experiences (Winkielman & Cacioppo, 2001). A cognitive mechanism proposes a two-step process, in which people draw on naïve theories to explain their subjective experiences and use them as judgment inputs. The affective mechanism instead proposes a three-step process: familiarity triggers positive affect, and people draw on a naïve theory such as "I feel positive and therefore I should like it" to make inferences about the object. This study, therefore, tests whether positive affect might function as the mediator in the metacognitive process as well, as depicted in Figure 1.

2 | METACOGNITION AND JUDGMENTS

A traditional view holds that when people make judgments, they draw on their knowledge about the target and their thought content (Schwarz, 2004, 2015). However, metacognition theory suggests that people also make judgments by drawing inferences from the subjective experiences that accompany their thought processes, such as the ease with which they can bring information to mind or process new information (Schwarz, 2004, 2015). Such inference drawing relies on people's naïve theories about how the brain works.

Depending on which naïve theories they use, people can apply their subjective experiences—which stem from various cognitive activities, including recall ease or difficulty (Tversky & Kahneman, 1973), ease of thought generation (Aarts & Dijksterhuis, 1999), processing fluency (Song & Schwarz, 2008), ease of pronunciation (Song & Schwarz, 2009), and perceived familiarity (Cho & Schwarz, 2006)—to make judgments about their preferences, liking, or view of the world (e.g., truth, validity, and probability; Alter & Oppenheimer, 2009; Schwarz, 2004, 2015). In a context that features varying numbers of advertised, known brands, such as on store shelves, consumers thus may experience two possible subjective experiences: perceived familiarity and decision fluency. This study aims to disentangle the influence of subjectively perceived familiarity from that of decision fluency.

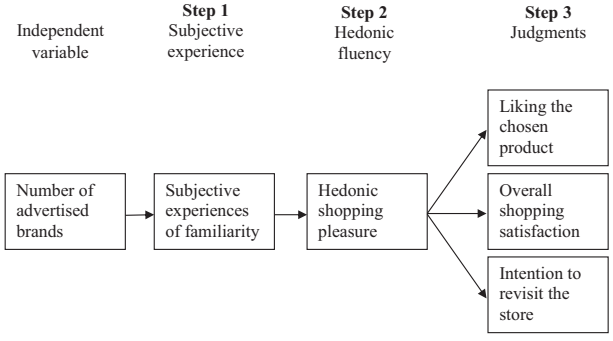

FIGURE 1 Proposed three-step metacognitive process

2.1 | Metacognitive effects triggered by decision fluency

Of the various metacognitive processes, processing fluency has been widely explored. It is "the subjective experience of ease with which people process information" (Alter & Oppenheimer, 2009, p. 219) or the "conscious experience of processing ease, low effort, high speed" (Winkielman, Cacioppo, Fazendeiro, & Reber, 2003, p. 193). Alter and Oppenheimer (2009) identify several sources of fluency, including perceptual, conceptual, imagery generation, and decision fluency. Because this study pertains to choice situations, the primary focus is on decision fluency.

When people experience processing fluency such as decision fluency, the subjective experience likely affects their judgment, depending on the context. Context-specific interpretations constitute naïve theories (Alter & Oppenheimer, 2009; Schwarz, 2004). For example, people might assume, "I experience fluency and therefore, this information must be true/valid/not innovative" or else, "this object must be famous/likable." Fluency can affect judgments of truth, validity, innovation, confidence, frequency, and liking (Cho & Schwarz, 2006; Reber & Schwarz, 1999; Reber, Schwarz, & Winkielman, 2004; Weisbuch & Mackie, 2009). This influence also entails a multiple-step process (Alter & Oppenheimer, 2009; Schwarz, 2004). According to a cognitive view, people first experience the ease or difficulty of processing, then attribute those cognitive experiences to their evaluations of the target (Winkielman & Cacioppo, 2001). For example, according to the fluency-attribution model (Bornstein & D'Agostino, 1994), subjective experience is neutral but when people must make an evaluation they try to arrive at a reasonable explanation for their experiences, such that they attribute them to liking the target. This process does not involve any mediation by positive affect.

Another explanation, as exemplified in the hedonic fluency model, instead is affective in nature, such that the process is mediated by positive affect (Winkielman & Cacioppo, 2001). The three-step process is as follows: people (a) experience subjective ease or difficulty processing information, (b) feel happy about processing fluency, and (c) evaluate the target using "how-do-I-feel-about-it" heuristics. Winkielman and Cacioppo (2001) offer two reasons processing fluency may be associated with positive affect: it indicates progress toward successful recognition, and it suggests that the processors are knowledgeable and can reach interpretations.

2.2 | Metacognitive effects triggered by familiarity

The subjective experience of familiarity, defined as "the feeling that an object or event is usual, typical, or has been seen before" (Smith, 2000, p. 109), appears inherent to people's memory systems. The

influence of familiarity on judgments also can be metacognitive in nature. Compared with unfamiliar objects, people like familiar objects more (Zajonc, 1968), find them more pleasant and appealing (Bornstein, 1989), rate them as more valid (Arkes, Boehm, & Xu, 1991), and perceive them as more famous (Jacoby, Kelley, Brown, & Jasechko, 1989).

Both misattribution and hedonic fluency models seek to explain the effects of object familiarity on evaluations. According to the misattribution model, for example, familiarity affects judgments through a misattribution process, such that people first experience familiarity, then attribute their subjective familiarity to the evaluative features (e.g., "I experience familiarity and it should impose no harm; therefore, I should like it").

In contrast, the hedonic fluency model posits that familiarity engenders positive affect, so people infer favorable evaluations of objects on the basis of how familiar they feel (Fang, Singh, & Ahluwalia, 2007). Prior research affirms that object familiarity is associated with positive affect (Garcia-Marques & Mackie, 2000). Smith (2000) also argues that familiar objects are inherently positive because people have experience with them, which signals safety and relatively little threat.

3 | METACOGNITION AND ADVERTISING JUDGMENTS

Metacognition also can explain advertising effects. In particular, perceptual fluency, a common type of processing fluency, is associated with more favorable judgments. For example, prior exposure to a storyboard for a product commercial enhance perceptual fluency and lead to more favorable evaluations when consumers encounter that advertised product later (Lee & Labroo, 2004). A picture that corresponds to the advertising narratives improves perceptual fluency, which facilitates imagery fluency and leads to more favorable ad and brand attitudes (Chang, 2013). Conceptual fluency, another common type, also improves ad evaluations, such that exposures to an advertising storyboard for ketchup that depicts a prototypical consumption setting (a fast-food restaurant) rather than a nonprototypical one (a supermarket) generates higher subsequent ratings of the ketchup (Lee & Labroo, 2004). Using the same, rather than different, plots in subsequent narrative ads also increases conceptual fluency, which improves ad and brand liking (Chang, 2009), and presenting culturally relevant narrative plots for the same brand increases conceptual fluency too, which facilitates imagery fluency and contributes to more favorable ad and brand attitudes (Chang, 2013).

This review suggests some gaps in advertising literature though. First, extant research focuses on the metacognitive process in ad viewing contexts only (Chang, 2009, 2013; Lee & Labroo, 2004). But ad exposures likely trigger metacognitive processes later, when consumers make choices in actual shopping contexts. Janiszewski (1993) demonstrates that prior exposures to brand names and product packages enhance perceptual fluency and result in more favorable brand evaluations. Similarly, prior exposure to advertising might enhance attitudes toward purchased products, shopping satisfaction, or intentions to revisit the store through a metacognitive process.

Second, other types of fluency that also may be triggered by advertising have drawn less attention, such as decision fluency. Findings of product variety and shopping experiences might lend support to the possible influences of decision fluency on judgments. For example, when consumers are offered a wealth of choices, they may find the decision more difficult and be less satisfied with their choices (Iyengar & Lepper, 2000). In online stores, displays of product choices can facilitate navigation though, which then enhances shopping pleasure and favorable attitudes toward the online stores (Chang, 2011). Such findings suggest possible influences of decision fluency on judgments. The current study seeks to address both these gaps.

4 | METACOGNITIVE EFFECTS TRIGGERED BY PRIOR AD EXPOSURE

In line with the metacognition literature, the current study predicts that the number of familiar brands will exert a metacognitive influence on the liking of purchased products, evaluations of the shopping experience, and evaluations of online stores. To explore which metacognitive mechanism gets invoked by varying the numbers of advertised brands in a choice set, the current study uses an online store product display as the relevant context. However, as previously noted, extant research identifies two possible metacognitive mechanisms, one through decision fluency and one through subjective experiences of familiarity. This study argues that the number of advertised brands in a choice should exert different patterns of impact on decision fluency versus familiarity.

4.1 | Number of advertised brands and decision fluency

The first mechanism suggests that prior exposure to advertised brands might increase perceptual fluency, which leads to decision fluency, defined as the subjective experience of the ease with which people make decisions. People misattribute their subjective experiences of decision fluency, using them to define their liking of the purchased products or their shopping experiences. Therefore, it is important to explore how increasing the number of advertised brands in a choice set affects decision fluency.

As prior research shows, a shelf that features more advertised brands might not lead to decision fluency, because consumers facing many choices find the decision difficult (Iyengar & Lepper, 2000). Because increasing the number of advertised brands on the shelves further causes them to compete for attention (Hendrickson & Ailawadi, 2014) and introduces decision difficulty, the positive effect of decision fluency should disappear when the choice set features a greater number of familiar brands, rather than a smaller number.

Decision fluency can be assessed using both subjective and objective measures, such as the subjective experience of decision ease or objective measures of the time spent making the decisions or gazing at objects (Schwarz, 2004). This study adopts all three of these measures to explore the effect of the number of advertised brands. Thus,

H1a: *Decision fluency (a) increases when the product shelf displays advertised brands as opposed to no advertised brands but (b) does not improve further when the product shelf displays more advertised brands as opposed to fewer advertised brands.*

H1b: *Time spent making the decision (a) decreases when the product shelf displays advertised brands as opposed to no advertised brands but (b) does not decrease further when the product shelf displays more advertised brands as opposed to fewer advertised brands.*

H1c: *Time spent gazing at product choices (a) decreases when the product shelf displays advertised brands as opposed to no advertised brands but (b) does not decrease further when the product shelf displays more advertised brands as opposed to fewer advertised brands.*

4.2 | Number of advertised brands and the subjective experience of familiarity

The second mechanism instead suggests that processing or decision fluency does not play a role; rather, subjective experiences of familiarity indicate safety, which is mistaken as favorable attitudes toward the purchased products and shopping experiences. Different from decision fluency, if the shelf features more advertised brands, people should experience greater subjective feelings of familiarity.

H2: *Subjective feelings of familiarity increase when the product shelf displays (a) advertised brands as opposed to no advertised brands and (b) more advertised brands as opposed to fewer advertised brands.*

5 | METACOGNITIVE EFFECTS OF DECISION FLUENCY VERSUS SUBJECTIVE FAMILIARITY ON JUDGMENTS

If, as the preceding hypotheses predict, the number of advertised brands triggers different influence patterns for decision fluency and subjective experiences of familiarity, according to the metacognitive experiences at play, then this number of advertised brands also should exert different influences on judgments. If decision fluency provides the input for judgments, a greater number of advertised brands (relative to fewer advertised brands) should not enhance favorable judgments. If subjective familiarity is the input though, increasing the number of advertised brands should improve judgments. In particular, in a retailing context, familiarity can signal safety and low risks (Smith, 2000), so a subjective experience of familiarity suggests that shopping with that particular retailer is safe, with little risk. But processing fluency is not always interpreted positively; whether it evokes positive reactions (e.g., "If I experience ease, I probably like it") or negative ones (e.g., "No pain, no gain" and "Easy things are not worthwhile") depends on the context (Briñol, Petty & Tormala, 2006). In a choice context, people may interpret decision fluency as a lack of barriers, leaving them more confident in their choice, or may regard it as a signal of insufficient effort, giving them less confidence (Tsai & McGill, 2011). When encountering two experiences (i.e., familiarity and decision fluency), people are likely to rely more on experiences that evoke clearer interpretations, seeing them as more diagnostic, and are likely to use them as judgment inputs. Therefore, if more familiar brands in a choice set enhance the subjective experience of familiarity, and this subjective experience serves as a judgmental input because it dominates, then more familiar brands in the choice set should lead to more favorable evaluations of the chosen brands.

H3a: *Participants like a chosen product better when the product shelf features (a) advertised brands as opposed to no advertised brands and (b) more advertised brands as opposed to fewer advertised brands.*

However, consumers might like a brand because it has greater brand equity, achieved through its advertising (Yoo et al., 2000). Therefore, strong evidence of metacognition effects requires their appearance in other judgments too. In an online shopping context for example, in addition to liking the purchased product, people may formulate evaluations of their shopping satisfaction or intentions to revisit the online store. If the subjective experience of brand familiarity serves as a judgmental input, it should affect people's evaluations of their shopping satisfaction and future intentions to shop at the store. Therefore,

H3b: *Participants are more satisfied with their shopping experience when the product shelf displays (a) advertised brands as opposed to no advertised brands and (b) more advertised brands as opposed to fewer advertised brands.*

H3c: *Future shopping intentions are greater when the product shelf displays (a) advertised brands as opposed to no advertised brands and (b) more advertised brands as opposed to fewer advertised brands.*

6 | HEDONIC FLUENCY

Finally, the process by which subjective experiences of familiarity exert influences on judgments might be cognitive or affective. People attribute subjective experiences to evaluative features (e.g., "I experience familiarity and therefore I should like it"), and positive affect thus might function in a mediating role (Fang et al., 2007). Familiarity is associated with positive affect (Garcia-Marques & Mackie, 2000; Smith, 2000), but a wide variety of types of positive affect might be triggered by metacognitive experiences (Smith, 2000). Pleasure, defined as emotional reactions to a stimulus that

evokes delight, is one such form of positive affect that people experience in shopping contexts (Nowlis & Shiv, 2005). This study thus explores whether the number of advertised brands affects this hedonic affective response.

H4: *Shopping pleasure is greater when the product shelf displays (a) advertised brands as opposed to no advertised brands and (b) more advertised brands as opposed to fewer advertised brands.*

7 | OVERVIEW OF THE STUDIES

The pilot study tests H1 and H2, using eye trackers while holding the price of the choices constant. Its purpose is to mitigate the potential influence of prices on choices. Study 2 tests all the hypothesis except for H1c, which pertains to gazing time. Because in a real-world setting, the prices of advertised brands likely would differ from those of nonadvertised brands, the main experiment also extends the pilot study by including relative price as a factor, to confirm whether the proposed effects emerge across different price conditions. In both studies, participants make their purchase choices using mock-up online store product pages that feature both high- and low-involvement products.

8 | PILOT STUDY

The pilot study tests whether the number of advertised brands featured in a choice set, unlike the simple presence of advertised rather than nonadvertised brands, exerts different impacts on subjective familiarity and decision fluency (H1–H2).

8.1 | Design and stimuli

The participants in this pilot study were recruited from a university in East Asia were asked to imagine themselves shopping with an online retailer that commonly features a lot of unadvertised brands; they were told that they would see 12 product displays and make product selections. Depending on the conditions to which they were assigned, they saw different product displays. Specifically, the experiment featured a mixed design (see Table 1), in which each participant was exposed to three blocks of stimuli. Each block featured four product categories: two with high-involvement and two with low-involvement products. For each product category, the display showed nine brands. As Table 1 illustrates, the four products in each block featured the same number of advertised brands but each of the three blocks contained differing numbers of advertised brands (0, 1, or 3). Depending on the assigned condition, the same product category included different numbers of advertised brands. Appendix A lists all the brands used in the study. Pretests helped identify advertised brands; the participants in the pretests checked a list of brands for each category to indicate whether they remembered seeing them advertised.

TABLE 1 Design for the pilot study

	Block					Block					Block				
	Low-involvement product 1	High-involvement product 1	Low-involvement product 2	High-involvement product 2	Rating experience	Low-involvement product 3	High-involvement product 3	Low-involvement product 4	High-involvement product 4	Rating experience	Low-involvement product 5	High-involvement product 5	Low-involvement product 6	High-involvement product 6	Rating experience
	Bottle water	Backpack	Cooling under-wear	Canvas shoes		Soda	Cameras	Chips	Jeans		Gum	Watches	Soap	Printers	
List 1	0/9	0/9	0/9	0/9		1/9	1/9	1/9	1/9		3/9	3/9	3/9	3/9	
List 2	1/9	1/9	1/9	1/9		3/9	3/9	3/9	3/9		0/9	0/9	0/9	0/9	
List 3	3/9	3/9	3/9	3/9		0/9	0/9	0/9	0/9		1/9	1/9	1/9	1/9	

Note. 0/9 indicated that among the nine choices, there are no advertised brands; 1/9 indicated that among the nine choices, there is one advertised brand; 3/9 indicated that among the nine choices, there are three advertised brands. People assigned to different list conditions were always exposed to the block with product shelves with no advertised brands, then blocks featuring one advertised brand, and finally blocks featuring three advertised brands.

In total, participants were exposed to 12 product displays (six high-involvement and six low-involvement products). The high-involvement products entail greater perceived risks of mispurchase, a higher probably of mispurchase, and greater importance (Laurent & Kapferer, 1985). Including both product categories increases the robustness of the findings. Furthermore, all the products could be consumed by both male and female consumers and appealed to college students. A series of pretests helped identify the products, according to existing product involvement scales (Laurent & Kapferer, 1985); the details of these pretests are available on request.

The six high-involvement products were backpacks, canvas shoes, cameras, jeans, watches, and printers; the six low-involvement products were bottled water, soda, chips, chewing gum, cooling underwear, and soap. For each product category, the nine brands appeared on a 3 × 3 shelf array, such that the distance from each displayed product to the center point of the shelf was similar. Across the 12 shelf displays, the advertised brands never were in a central position but rather appeared randomly across the eight other positions (see Appendix B). Because a realistic shopping setting would make prices available on the product shelf, all the brands on the same shelves had the same prices, which thereby mitigated the potential influence of prices on choices.

8.2 | Participants

Twenty-four college students (12 female; 19–25 years, $M = 20.88$ years; 16 different majors) with normal or corrected-to-normal vision were recruited from the web and participated in exchange for payment.

8.3 | Apparatus

Eye movements were recorded using an SR Research Eyelink 1000 Desktop Mount system (SR Research, ON, Canada), tracking at a sampling rate of 1,000 Hz. Participants leaned on a chin rest in front of a 22-inch computer screen (VX2268WM, 1024 × 768 pixels) at a viewing distance of 75 cm. The stimulus presentation and response recording were controlled by Matlab 2012a (The MathWorks, Inc., MA) with the Psychtoolbox 2.54 (The MathWorks, Inc., MA).

8.4 | Procedures

Participants completed the experiment individually. Upon arriving at the lab, they were instructed to imagine that they were shopping in an online store. In each of the three treatment blocks, participants viewed four shelf displays and chose one item from each display by clicking on it. Participants' eye movements were recorded during their decision-making process, as was their reaction time before making their choice from each product display. Although the viewing was binocular, only the participant's dominant eye was tracked. A 9-point calibration and validation procedure was conducted at the beginning of the experiment. If the average error of the 9-point calibration was less than 1 degree of visual angle, the calibration was considered accurate. Otherwise, the fixation was deemed inaccurate, and a recalibration was performed.

To familiarize participants with the task, the experiment started with a practice trial for a 3 × 3 shelf display for toothpaste. Before each product display, a center fixation cross appeared on the screen, for a fixation check. If the participant accurately fixated on the cross, the experimenter pressed a button to begin the display and choice session. Each block consisted of two phases: the purchase and eye-tracking procedures and then poststimulus questionnaires that probed participants' subjective experiences. After every four shelf displays, participants filled out a questionnaire about their choice-making experiences in the previous block, including how familiar they found the product choices and how easily they made their choices.

8.5 | Measures

All measures used 7-point Likert scales, with higher numbers indicating greater agreement. Because this study involved making 12 choices, both the pilot study and the main experiment adopted one-item scales for some measures, to reduce the potential respondent fatigue that might arise from asking them to rate multiple items repeatedly. After each block, participants rated in general how familiar the choice sets were to them, using the item: "In general, how familiar did you find these products on these product displays?" For decision fluency, this study used both subjective (*decision fluency*) and objective (*decision time* and *gazing time*) measures. First, as subjective measures, after finishing their product choices in each block, participants responded to two items: "How easy is it for you to make choices?" and "How effortful is it for you to make choices?" (Pearson's *R*s ranged from 0.63 to 0.73, all *p*s < 0.01). As objective measures, for each product display, the amount of time they spent making decisions and the total time they gazed at the product choices were recorded.

8.6 | Results

A repeated measures analysis of variance (ANOVA) indicated that the number of advertised brands did not affect participants' *decision fluency*, $F(2, 46) = 1.86$, $p = 0.18$. The planned contrast revealed that decision fluency was greater when the choice set featured advertised as opposed to no advertised brands, but the difference only approached significance ($p = 0.06$). Decision fluency did not differ when the choice set featured more as opposed to fewer advertised brands (see Table 2).

According to the next repeated measures ANOVA, the number of advertised brands did not affect participants' *decision time*, $F(2, 46) = 2.74$, $p = 0.09$, and the planned contrast demonstrated that decision time was shorter when the choice set featured advertised as opposed to no advertised brands but it did not reach significance ($p = 0.07$). Decision time did not differ when the choice set featured more as opposed to fewer advertised brands (see Table 2). Because decision time was measured after each product choice, product involvement was analyzed as a within-subjects factor. Product

TABLE 2 Effects of number of advertised brands in the choice set

		Means			Main effects		Planned contrasts							
							0 vs. later		0 vs. 1		1 vs. 3		0 vs. 3	
		No advertised brands (0)	One advertised brands (1)	Three advertised brands (3)	*F*	*p*	*F*	*p*	*F*	*p*	*F*	*p*	*F*	*p*
The pilot study														
H1	Subjective familiarity	1.96	2.96	3.96	16.75	0.01	30.29	0.01	11.50	0.01	9.20	0.01	34.50	0.01
		(0.81)	(1.30)	(1.30)										
H2	Subjective ease	4.15	4.60	4.56	1.86	0.18	3.87	0.06	2.83	0.11	0.02	0.89	2.41	0.14
		(1.19)	(1.29)	(1.09)										
H3	Decision time	16,835.05	15,469.12	15,268.10	2.74	0.09	3.58	0.07	1.38	0.25	0.03	0.85	5.68	0.03
		(1,792.72)	(1,729.63)	(1,556.05)										
H4	Total gaze time	14,395.62	13,002.38	12,600.74	3.56	0.05	4.69	0.04	1.79	0.19	0.19	0.67	7.44	0.01
		(1,611.17)	(1,484.31)	(1,263.83)										
The main experiment														
H1	Subjective familiarity	1.84	2.32	3.73	94.92	0.01	91.79	0.01	11.42	0.01	97.22	0.01	175.24	0.01
		(0.10)	(0.10)	(0.10)										
H2	Subjective ease	4.13	4.56	4.68	9.78	0.01	18.83	0.01	10.84	0.01	0.80	0.37	17.51	0.01
		(0.09)	(0.09)	(0.09)										
H3	Decision time	20.20	14.89	15.82	8.56	0.01	16.67	0.01	15.00	0.01	0.46	0.50	10.11	0.01
		(0.97)	(0.97)	(0.97)										
H5	Like the chosen product	4.50	4.76	5.10	20.62	0.01	28.18	0.01	7.53	0.01	13.31	0.01	40.88	0.01
		(0.07)	(0.07)	(0.07)										
H6	Overall shopping satisfaction[a]	3.90	4.03	4.62	6.72	0.01	5.57	0.02	0.41	0.52	7.86	0.01	11.88	0.01
		(1.16)	(1.13)	(1.14)										
H7	Future visit intention[a]	3.62	3.80	4.38	6.06	0.01	5.70	0.02	0.63	0.43	6.43	0.01	11.12	0.01
		(1.19)	(1.26)	(1.30)										
H8	Shopping pleasure	4.30	4.37	4.55	4.10	0.02	4.15	0.04	0.57	0.45	4.09	0.05	7.33	0.01
		(0.07)	(0.07)	(0.07)										
	Overall shopping pleasure[a]	4.05	4.28	4.83	8.71	0.01	9.18	0.01	1.39	0.24	8.29	0.01	16.46	0.01
		(1.06)	(1.08)	(0.98)										

Note. The shaded area indicates the hypothesized significant effects.

[a]Measures taken after shopping; rows without asterisks were measured after each choice.

involvement did not moderate the influence of the number of advertised brands, $F(1, 46) = 1.56$, $p = 0.23$.

The next repeated measures ANOVA indicated that the number of advertised brands affected participants' *gazing time*, $F(2, 46) = 3.56$, $p = 0.05$. Consistent with the predictions in H1c, the results of the planned contrast revealed that gazing time was shorter when the choice set featured advertised brands as opposed to no advertised brands but did not differ when the choice set featured more as opposed to fewer advertised brands (see Table 2). Gazing time also was measured after each product choice, so product involvement again was analyzed as a within-subjects factor, and once more, it did not moderate the influence of the number of advertised brands, $F(1, 46) = 1.67$, $p = 0.21$.

In another ANOVA, the number of advertised brands in the choice set affected participants' *subjective familiarity*, $F(2, 46) = 16.75$, $p < 0.01$. The results of the planned contrast also showed that subjective familiarity was higher when the choice set featured advertised as opposed to no advertised brands and when the choice set featured more as opposed to fewer advertised brands (see Table 2). Therefore, the findings support H2.

8.7 | Discussion

The pilot test findings support H1c and H2. Product shelves displaying some advertised brands increase both subjective familiarity and gazing time, compared with shelves with no advertised brands. But displaying more as opposed to fewer advertised brands generated only more subjective familiarity, not greater gazing time. If judgments follow the same pattern as that for familiarity, but not decision fluency, we can be sure it is familiarity, but not decision fluency, serving as an input for judgments.

The pilot study suffers a few limitations though. First, all products in the same category feature the same prices, whereas, in a real-world setting, the prices of advertised brands likely would differ from those of nonadvertised brands, and consumers' choices often are influenced by the relative prices. Therefore, the main experiment includes relative price as a factor to confirm whether the proposed effects emerge even across different price conditions. Second, the measures of perceived familiarity and decision fluency appeared after participants finished each block of four product shelf displays (two high-involvement and two low-involvement). Therefore, the pilot test cannot identify any moderating influence of product involvement on these two responses. The main experiment conducts the measures after each product choice to address this issue. Third, the pilot study did not test the assumption that remembering seeing the brands being advertised might contribute to brand recognition and thus familiarity. The main experiment tests this assumption directly.

9 | MAIN EXPERIMENT

9.1 | Design and stimuli

The mixed design of the main experiment features two between-subject factors, namely, the number of advertised brands (three levels) and relative prices of the advertised brands (three levels), as well as two within-subject factors, involvement (high vs. low) and product types (six types; see Table 3 for the design).

The number of advertised brands varied from no advertised brands (nine unknown brands) to one advertised brand (eight unknown and one advertised brand) to three advertised brands (six unknown and three advertised brands). The relative prices of the brands also featured three conditions, such that the prices for the advertised brands were higher than, lower than, or the same as the prices for the nonadvertised brands. Similar to the pilot study, nine products appeared on the page for each product category. The other stimuli remained the same, except for the price labels. In this study, the prices reflected the average market prices (AMPs) of the three advertised brands, such that in the similar price condition, all product prices were set at AMP. In the higher price condition, the advertised brands were priced 10–15% higher than the other choices, which were set at AMP. In the lower price condition, the advertised brands were priced 10–15% lower than the rest of the choices, which again were set at AMP (see Appendix C for examples).

Similar to the pilot study, participants were exposed to product displays, which featured 12 product categories, six high-involvement and six low-involvement ones. To reduce the influence of the idiosyncratic characteristics of featuring certain product categories to represent high- or low-involvement product categories, six different product categories for each condition were included.

9.2 | Participants and procedures

A university in East Asia included a recruitment ad in an e-newsletter, sent to all registered undergraduate students. The first 180 students (average age = 20.29 years, $SD = 1.25$, 30 majors) who responded became the participants and received payment for their participation. To reduce the confounding influence of gender across different conditions, equal numbers of male and female participants were recruited and randomly assigned to the manipulated conditions. This randomized block design thus used gender as a blocking variable (Keppel, 1991).

The experiment was conducted in a lab. All participants were asked to imagine themselves shopping in a typical store online, such as Target or Amazon. They would need to make one purchase choice for each of the 12 different product categories, and they were advised to make their selections as if they were shopping at home. Participants then were randomly assigned to one of the nine conditions. They read the instructions and reviewed the shelf displays, as in the pilot study. After making each purchase choice, they rated the ease of doing so, how much they enjoyed the choice process, how much they liked their choice, and in general how familiar they found the featured products. Their reaction times were recorded too. They repeated this procedure for all 12 product categories. Finally, after they finished shopping, the participants indicated how much they enjoyed the whole shopping experience, how satisfied they were with the online store, and how likely they would be to visit this store in the future. They also completed some manipulation checks.

TABLE 3 Design for the main study

Between-subject factors		Within-subject factors: High- and low-involvement (2) X product type (6)											
Factor 1	Factor 2	Low-involvement product 1	High-involvement product 1	Low-involvement product 2	High-involvement product 2	Low-involvement product 3	High-involvement product 3	Low-involvement product 4	High-involvement product 4	Low-involvement product 5	High-involvement product 5	Low-involvement product 6	High-involvement product 6
Number of advertised brands	Relative prices of advertised brands	Bottle water	Back-pack	Cooling underwear	Canvas shoes	Soda	Cameras	Chips	Jeans	Gum	Watches	Soap	Printers
0/9	Higher The same Lower												
1/9	Higher The same Lower												
3/9	Higher The same Lower												

9.3 | Measures

9.3.1 | Manipulation checks

Participants rated each of the brands used in this experiment (3 advertised, 9 nonadvertised, in 12 product categories) in terms of whether they remembered seeing it being advertised (yes/no). They also revealed whether they recognized each brand (yes/no).

9.3.2 | Measures after each choice

Participants rated their *decision fluency* using two items: "How easy is it for you to make a choice?" and "How effortful is it for you to make a choice?" (Pearson's *R*s ranged from 0.58 to 0.84 for all 12 choice experiences, all *p*s < 0.01). They also rated their *shopping pleasure* using two items: "You just browsed the page and made a product choice, how much did you enjoy the experience?" and "You just browsed the page and made a product choice, how much pleasure did the experience bring you?" (Pearson's *R*s ranged from 0.47 to 0.77 for all 12 choice experiences, all *p*s < 0.01). Next, they rated their *liking of the choice*, using the item "How much do you like the product you just chose?" Finally, they rated *product familiarity*: "In general, how familiar did you find these products?"

9.3.3 | Measures after shopping

Participants rated two items to capture their *overall shopping pleasure*: "I enjoy shopping at this e-store," and "It brought me pleasure to shop at this e-store" (Pearson's $R = 0.79$, $p < 0.01$). For *shopping satisfaction*, the measure featured the item, "In general, how satisfied were you with this shopping experience?" *Shopping intention* included the item, "How likely are you to shop at this e-store in the future?"

9.4 | Results

9.4.1 | Manipulation checks

Participants were more likely to recognize advertised, rather than nonadvertised, brands as such; they were more likely to recognize nonadvertised, rather than advertised, brands as nonadvertised. The difference was significant for all product categories, with χ^2 values ranging from 1,057.57 to 1,760.14, and all *p*s < 0.01. Furthermore, the participants were more likely to recognize advertised brands than nonadvertised brands, with χ^2 values ranging from 1,015.30 to 1,803.23 for the 12 product categories, and all *p*s < 0.01.

9.4.2 | Hypotheses tests

A repeated measures ANOVA indicated that the number of advertised brands affected participants' subjective *decision fluency*, $F(2, 177) = 9.78$, $p < 0.01$, $\eta^2 = 0.10$. As expected, the planned contrast revealed that decision fluency was greater when the choice set featured advertised as opposed to nonadvertised brands but did not differ when the choice set featured more as opposed to fewer advertised brands, in support of H1a. Involvement was a significant

moderator, $F(2, 177) = 14.68$, $p < 0.01$, but price differences were not, $F(2, 178) = 0.76$, $p = 0.55$.

In the next repeated measures ANOVA, the number of advertised brands affected *decision time*, $F(2, 177) = 8.56$, $p < 0.01$, $\eta^2 = 0.09$, and the planned contrast revealed that decision time was shorter when the choice set featured advertised, as opposed to no advertised, brands but not if it featured more as opposed to fewer advertised brands. The findings thus support H1b. Involvement was not a significant moderator, $F(2, 177) = 0.80$, $p = 0.45$, and neither was the price difference, $F(2, 178) = 1.76$, $p = 0.14$.

Another repeated measures ANOVA indicated that the number of advertised brands in the choice set affected participants' *subjective familiarity*, $F(2, 177) = 94.92$, $p < 0.01$, $\eta^2 = 0.51$. In support of H2, the results of the planned contrast showed that subjective familiarity was higher when the choice set featured advertised brands as opposed to no advertised brands and when it featured more as opposed to fewer advertised brands (Table 3). Involvement according to the number of advertised brands was not significant, $F(2, 177) = 1.27$, $p = 0.28$, nor was the price difference, $F(2, 178) = 2.04$, $p = 0.09$.

According to a repeated measures ANOVA, the number of advertised brands also affected participants' *liking of the chosen product*, $F(2, 177) = 20.62$, $p < 0.01$, $\eta^2 = 0.19$. In support of H3a, the planned contrast results showed that participants liked the purchased product better when the choice set featured advertised brands as opposed to no advertised brands and more as opposed to fewer advertised brands. Involvement was not a significant moderator, $F(2, 177) = 2.72$, $p = 0.07$, nor was price difference, $F(2, 178) = 0.86$, $p = 0.49$.

The ratings of *satisfaction* with their overall shopping experience indicated values of $F(2, 177) = 6.72$, $p < 0.01$, $\eta^2 = 0.07$ from the ANOVA. Consistent with H3b, the planned contrast suggested that shopping satisfaction was higher when the choice set featured advertised brands as opposed to no advertised brands and more as opposed to fewer advertised brands. Price difference was not a significant moderator, $F(2, 178) = 0.67$, $p = 0.62$.

The ANOVA for participants' *intentions to revisit* the e-store showed values of $F(2, 177) = 6.06$, $p < 0.01$, $\eta^2 = 0.06$. Confirming the predictions in H3c, the results of the planned contrast demonstrated that intentions to revisit were higher when the choice set featured advertised brands as opposed to no advertised brands and more as opposed to fewer advertised brands. Price difference again was not a significant moderator, $F(2, 178) = 0.63$, $p = 0.65$.

After making each choice, they rated the choice process. The repeated measures ANOVA indicated that the number of advertised brands in the choice set affected participants' *shopping pleasure*, rated after each choice, $F(2, 177) = 4.10$, $p = 0.02$, $\eta^2 = 0.05$, and the planned contrast suggested that shopping pleasure was greater when the choice set featured advertised brands as opposed to no advertised brands and more as opposed to fewer advertised brands, in support of H4. Involvement was not a significant moderator, $F(2, 177) = 2.01$, $p = 0.14$, nor was price difference, $F(2, 178) = 0.08$, $p = 0.99$. Furthermore, the participants rated their *overall shopping pleasure*. This ANOVA revealed $F(2, 177) = 8.71$, $p < 0.01$, $\eta^2 = 0.09$, and the planned contrast showed that overall shopping pleasure was greater when the choice set featured advertised brands as opposed to no advertised brands and more as opposed to fewer advertised brands. Price difference was not a significant moderator, $F(2, 178) = 0.91$, $p = 0.46$.

9.4.3 | Mediation analysis

The number of advertised brands might affect the three dependent variables (liking the purchased products, shopping satisfaction, and visit intentions) through the influence of a series of mediators (familiarity and then pleasure). In the experiment, participants rated their *subjective familiarity* and *liking of the purchased item* after each choice. Each participant was assigned to a store that featured no, low, or high numbers of advertised brands, so their subjective familiarity and liking of the purchased products were averaged across the 12 product categories, to be used as inputs for the mediation analysis. After shopping, participants also were asked about their *shopping pleasure*, *shopping satisfaction*, and future *intentions to shop* at the store. They were used directly as inputs for the mediation analysis.

The mediation tests relied on Hayes's (2013) bootstrapping methodology and the related PROCESS macro (Model 6). The analysis adopted two orthogonal codes for the number of advertised brands (1 = −1, 0.5, 0.5; 2 = 0, −1, 1). The first orthogonal code enables a comparison between shelves displaying advertised and nonadvertised brands; the second orthogonal code supports the comparison of shelves displaying more as opposed to fewer advertised brands.

When *liking the purchased product* was the dependent variable and *familiarity* and *shopping pleasure* were the mediators, the indirect effect of Code 1 was significant, with a point estimate of 0.05 and a 95% confidence interval (CI) between 0.0224 and 0.1113 (see Table 4, Model 1A). The indirect effect of Code 2 also was significant, with a point estimate of 0.05 and a 95% CI between 0.0234 and 0.1027 (Table 4, Model 1B). When *decision fluency* and *shopping pleasure* were the mediators, the indirect effect of Code 1 was significant, with a point estimate of 0.03 and a 95% CI between 0.0068 and 0.0647 (Table 4, Model 1C). However, the indirect effect of Code 2 was not significant (Table 4, Model 1D).

With *shopping satisfaction* as the dependent variable and *familiarity* and *shopping pleasure* as the mediators, the indirect effect of Code 1 was significant, with a point estimate of 0.16 and a 95% CI between 0.0754 and 0.2738 (Table 4, Model 2A); the indirect effect of Code 2 also was significant, with a point estimate of 0.15 and a 95% CI between 0.0738 and 0.2407 (Table 4, Model 2B). When *decision fluency* and *shopping pleasure* were the mediators, the indirect effect of Code 1 was significant, with a point estimate of 0.09 and a 95% CI between 0.0269 and 0.1802 (Table 4, Model 2C), whereas the indirect effect of Code 2 was not significant (Table 4, Model 2D).

Using *intention to revisit the store* as the dependent variable and *familiarity* and *shopping pleasure* as mediators, the indirect effect of Code 1 was significant with a point estimate of 0.15 and a 95% CI between 0.0715 and 0.2668 (Table 4, Model 3A); the indirect effect

of Code 2 also was significant with a point estimate of 0.14 and a 95% CI between 0.0693 and 0.2343 (Table 4, Model 3B). When *decision fluency* and *shopping pleasure* instead were the mediators, the indirect effect of Code 1 was significant, with a point estimate of 0.09 and a 95% CI between 0.0245 and 0.1704 (Table 4, Model 3C), but the indirect effect of Code 2 was not significant (Table 4, Model 3D).

10 | GENERAL DISCUSSION

10.1 | Findings and contributions

This paper adopts a triangulation approach, employing both eye-trackers and behavioral experiment with mock-up product pages for online stores, which provide convergent evidence. The findings of the main study generally replicate those of the pilot study: even though both perceived familiarity and decision fluency increase when the choice set displays advertised brands, only perceived familiarity (not decision fluency) improves when the choice set expands to include more (three) as opposed to fewer (one) advertised brands. Furthermore, the main experiment demonstrates that patterns of judgments (liking of purchased products, shopping satisfaction, and intentions to revisit the store) reflect subjective familiarity patterns, such that a choice set with more advertised brands generates more favorable judgments. Mediation analyses also confirm a three-step metacognitive process, in which hedonic feelings (i.e., shopping pleasure) function as a mediator.

The findings of these two studies contribute to extant literature in three important ways. First, extending prior advertising and metacognition research, this study demonstrates that metacognition can explain the influence of advertising in a decision context. Metacognition has not been applied widely to understand advertising effects. Among studies that adopt a metacognitive approach, the focus tends to be limited to ad viewing contexts and to how advertising content or features facilitate or reduce perceptual or conceptual fluency, which then influences consumers' ad and brand evaluations. The current study extends this line of research by showing that prior exposure to advertising enhances shopping pleasure and satisfaction, and even can increase liking of purchased items in purchase contexts.

Second, this study extends prior research by disentangling the influence of two potential subjective experiences exerted by advertised brands in a decision context: subjective perceived familiarity versus decision fluency. The main study demonstrates that when participants encounter two subjective experiences, the familiarity that stems from an explicit association (e.g., safety, no risks) is more likely to be taken into account during the judgment formation process than is decision fluency, which could be interpreted in different ways (e.g., low or high confidence in the choice). Mediation analyses confirm that decision fluency triggered by the number of advertised brands (greater vs. fewer) does not mediate its influence on shopping satisfaction or intentions to revisit the online store through shopping pleasure.

Third, the study findings add to metacognition literature pertaining to advertising topics by demonstrating that hedonic experiences have an important role and thereby confirming a three-step mechanism. Two competing models appear in prior metacognition literature, one involving only subjective experiences and other linking subjective experiences to hedonic experience. Extant advertising research centers more on the two-step metacognitive process, involving only subjective experiences (Chang, 2013; Lee & Labroo, 2004), whereas this study advances understanding by showing that hedonic experiences triggered by the number of advertised brands also are pivotal in a choice context.

10.2 | Further research directions and limitations

The study context inevitably varies from real shopping contexts, as is true of all experimental research. For example, though participants in the two studies made choices, their choices are not driven by actual needs, nor do they need to consider their budgets, as they likely would in a real purchase setting. Whereas, there are no consequences of a poor choice in an experimental setting, in real life, making poor purchase decisions can lead to negative outcomes. Further research might test the proposed model in real purchase settings, such as through collaborations with retailers.

The pilot study and main experiment involve participants making 12 choices. Depending on the shopping trip type (e.g., major, fill-in, or shopping primarily for price specials), the average number of items purchased in a trip varies (Walters & Jamil, 2003). Further research thus might explore how the number of decisions involved and the types of shopping goals influence consumers' shopping experiences at a store that carries different numbers of advertised brands.

Asking consumers to rate multiple items for all 12 choices also might have generated fatigue. Various studies indicate no difference in the predictive validity of single- versus multiple-item scales, such that the use of single-item scales is appropriate when the measured constructs are not multidimensional (e.g., Bergkvist & Rossiter, 2007; Drolet & Morrison, 2001; Rossiter, 2002). Bergkvist and Rossiter (2009) also demonstrate that tailor-made, single-item measures of advertising attitudes, brand attitudes, and purchase intentions achieve the same predictive validity as traditional multiple-item measures. However, considering the potential issues still associated with single-item scales (Churchill, 1979), this choice must be taken into account when interpreting the study findings.

Although the findings of this study are robust across products with different levels of involvement and varying relative price conditions, it is important to explore whether the metacognitive influences triggered by different numbers of advertised brands differ due to any other variables. For example, in brick-and-mortar stores, the eye level at which advertised brands are displayed might affect perceived subjective familiarity; prior research suggests that products at eye-level are more likely to attract attention (Hendrickson & Ailawadi, 2014) and dominate perceptions. Moreover, packages or the presence of sales promotion cues

TABLE 4 Total, Direct, and Indirect Effects

	Model 1 A **IV: Code 1** **M1: Subjective familiarity** **M2: Shopping pleasure** **DV: Liking the purchased product**				**Model 1B** **IV: Code 2** **M1: Subjective familiarity** **M2: Shopping pleasure** **DV: Liking the purchased product**				**Model 1 C** **IV: Code 1** **M1: Decision fluency** **M2: Shopping pleasure** **DV: Liking the purchased product**				**Model 1D** **IV: Code 2** **M1: Decision fluency** **M2: Shopping pleasure** **DV: Liking the purchased product**			
Total Effects																
	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI
Total effects	.29**	.06	.1686	.4045	.17**	.05	.0824	.2606	.28**	.06	.1686	.4045	.17**	.05	.0824	.2606
Total direct effects	.14*	.06	.0288	.2523	.02	.05	−.0779	.1190	.14*	.04	.0562	.2237	.10*	.04	.0160	.1794
Indirect Effects																
	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI
Total indirect effects	.15*	.05	.0692	.2379	.15*	.04	.0791	.2371	.15*	.04	.0725	.2520	.07*	.03	.0152	.1460
M1	.07*	.03	.0138	.1372	.09*	.03	.0400	.1442	.07*	.02	.0341	.1336	.02	.02	−.0169	.0591
M2	.02	.03	−.0374	.0976	.01	.03	−.0339	.0694	.05*	.03	.0031	.1067	.05*	.02	.0142	.1079
M1×M2	.05*	.02	.0224	.1113	.05*	.02	.0234	.1027	.03*	.01	.0068	.0647	.01	.01	−.0055	.0230
	Model 2 A IV: Code 1 M1: Subjective familiarity M2: Shopping pleasure DV: Shopping satisfaction				Model 2B IV: Code 2 M1: Subjective familiarity M2: Shopping pleasure DV: Shopping satisfaction				Model 2 C IV: Code 1 M1: Decision fluency M2: Shopping pleasure DV: Shopping satisfaction				Model 2D IV: Code 2 M1: Decision fluency M2: Shopping pleasure DV: Shopping satisfaction			
Total Effects																
	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI
Total effects	.28*	.12	.0398	.5269	.29**	.11	.0844	.4990	.28*	.12	.0398	.5269	.29**	.11	.0844	.4990
Total direct effects	−.10	.11	−.3109	.1169	−.01	.09	−.1906	.1624	.04	.10	−.1661	.2397	.09*	.08	−.0694	.2527
Indirect Effects																
	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI
Total indirect effects	.38*	.10	.1998	.5709	.31*	.08	.1492	.4645	.25**	.09	.0867	.4300	.20	.07	.0656	.3380
M1	.15*	.06	.0557	.2818	.12*	.05	.0337	.2129	.01	.03	−.0665	.0648	.01	.01	−.0094	.0306
M2	.07	.09	−.1142	.2560	.04	.07	−.1023	.1751	.15*	.08	.0000	.3193	.18*	.07	.0468	.3085
M1×M2	.16*	.05	.0754	.2738	.15*	.04	.0738	.2407	.09*	.04	.0269	.1802	.02	.02	−.0202	.0672
	Model 3 A **IV: Code 1** **M1: Subjective familiarity** **M2: Shopping pleasure** **DV: Intention to revisit store**				**Model 3B** **IV: Code 2** **M1: Subjective familiarity** **M2: Shopping pleasure** **DV: Intention to revisit store**				**Model 3 C** **IV: Code 1** **M1: Decision fluency** **M2: Shopping pleasure** **DV: Intention to revisit store**				**Model 3D** **IV: Code 2** **M1: Decision fluency** **M2: Shopping pleasure** **DV: Intention to revisit store**			
Total Effects																
	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI
Total effects	.32*	.13	.0582	.5751	.29**	.12	.0577	.5256	.32*	.13	.0582	.5751	.29*	.12	.0577	.5256
Total direct effects	−.04	.12	−.2813	.1987	−.01	.10	−.2096	.1995	.11	.12	−.1205	.3425	.11	.10	−.0932	.3011

(Continues)

TABLE 4 (Continued)

	Model 3 A IV: Code 1 M1: Subjective familiarity M2: Shopping pleasure DV: Intention to revisit store				Model 3B IV: Code 2 M1: Subjective familiarity M2: Shopping pleasure DV: Intention to revisit store				Model 3 C IV: Code 1 M1: Decision fluency M2: Shopping pleasure DV: Intention to revisit store				Model 3D IV: Code 2 M1: Decision fluency M2: Shopping pleasure DV: Intention to revisit store			
Indirect Effects	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI	Effect	Boot SE	LLCI	ULCI
Total indirect effects	.36*	.10	.1641	.5683	.31*	.08	.1403	.4524	.21*	.09	.0490	.3879	.19*	.06	.0648	.3151
M1	.14*	.06	.0251	.2849	.12*	.05	.0160	.2331	−.03	.03	−.1122	.0261	−.01	.01	−.0380	.0057
M2	.06	.09	−.1071	.2470	.04	.07	−.1024	.1626	.15*	.08	.0040	.3187	.17*	.06	.0549	.2979
M1×M2	.15*	.05	.0715	.2668	.14*	.04	.0693	.2343	.09*	.04	.0245	.1704	.02	.02	−.0196	.0631

Notes. Code 1 means that no advertised brands, one advertised brand, and three advertised brands were assigned values of −1, .5, and .5, respectively. Code 2 means that no advertised brands, one advertised brand, and three advertised brands were assigned values of 0, −1, and 1, respectively. SE = standardized error, LLCI = lower-level confidence interval, ULCI = upper-level confidence interval.

in stores affect the allocation of consumers' attention (Hendrickson & Ailawadi, 2014) and may alter their sense of subjective familiarity. In this study, all the products were displayed in 3 × 3 arrays, which ensured that the distance from each product to the center point was similar. However, shelves in stores present products in a wide variety of arrays, so the findings might not generalize to other types of presentations. In online stores, research also should explore whether featuring product options on one page, as opposed to different layers of pages, changes the processing fluency, because product options presented with more or fewer layers can affect navigation fluency (Chang, 2011). On a similar note, the positions of the advertised brands were not considered as a factor for this study. In both the pilot and the main studies, the advertised brands appeared randomly in the 3 × 3 arrays (except for the central position). The patterns of effects triggered by the number of advertised brands were similar across all 12 product displays but the positions of the advertised brands still could have drawn different degrees of attention.

Finally, this study used nine options for all products, whereas the sizes of consideration sets for different product categories vary (Hauser & Wernerfelt, 1990), as do the brands offered for each product category (Hendrickson & Ailawadi, 2014). For example, consideration sets tend to grow larger with more product involvement (Divine, 1995; Miquel, Caplliure, & Aldas-Manzano, 2002). Consumers' willingness to spend time evaluating the options also differs across product categories (Hendrickson & Ailawadi, 2014). Subjectively, a shopping experience may seem to require more effort if consumers are less willing to spend time on their evaluations. Further research should examine whether the number of options displayed on product shelves affects consumers' shopping experiences.

10.3 | Managerial implications

Making purchase decisions can be effortful, especially when people shop at a generic online store (e.g., Target) and need to make a series of choices during that visit. In turn, finding ways to facilitate this process is a critical goal of online retailers (Kahn, 2017), for which product displays are key influences. Prior research provides insights into how to display products (e.g., Chang, 2011; Deng, Kahn, Unnava, & Lee, 2016), but even before determining how to display product assortments, an important decision involves which products to display. The current findings suggest the need to include a certain number of advertised brands to enhance consumers' sense of familiarity, which can contribute to their shopping pleasure and enhance their overall satisfaction, as well as their liking of the chosen product and their intention to revisit the store in the future. Notably, these findings are robust, such that the proposed three-step metacognitive process emerges for products that evoke varying levels of product involvement and when the relative prices between advertised and nonadvertised brands differ.

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APPENDIX A

Brands Used in the Pilot and Main Experiment as They Appeared on Display

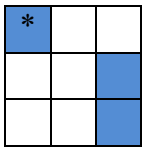
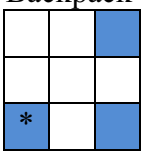
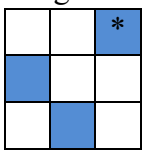
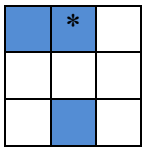
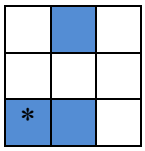
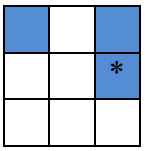
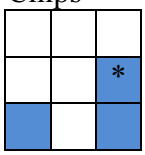
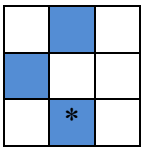
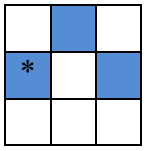
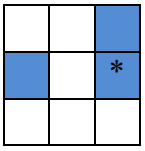
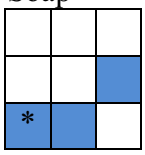
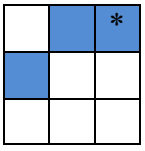
		0/9			1/9			3/9		
LI 1	Bottled water	Blue Water	Crystal Cool	Ooze Spring	Yes*	Crystal Cool	Ooze Spring	Yes*	Crystal Cool	Crystal Cool
		Mountain Spring	Energy Synergy	Pure	Mountain Spring	Energy Synergy	Pure	Mountain Spring	Energy Synergy	Energy* Synergy
		Forest Fountain	Shuhuo	Green Breath	Forest Fountain	Shuhuo	Green Breath	Forest Fountain	Shuhuo	Shuhuo*
HI 1	Backpack	BARTACK	T-Tech	OIWAS	BARTACK	T-Tech	OIWAS	BARTACK	T-Tech	NIKE*
		CRUMPLER	ARCTERY X	UDG	CRUMPLER	ARCTERY X	UDG	CRUMPLER	ARCTERY X	UDG
		stm	Everki Swift	KR3W	adidas*	Everki Swift	KR3W	adidas*	Everki Swift	PUMA*
LI 2	Cooling underwear	Paul Simon	ATUM	WIWI	Paul Simon	ATUM	Lativ*	Paul Simon	ATUM	Lativ*
		DB Block	Voyya	DHgate	DB Block	Voyya	DHgate	Uniqulo*	Voyya	DHgate
		Cooley	eeParty	Icetyle	Cooley	eeParty	Icetyle	Cooley	7 select*	Icetyle
HI 2	Canvas shoes	Balletangel	Valentine Coupeau	Iruka	Balletangel	Converse*	Iruka	adidas*	Converse*	Iruka
		Two Boss	LD image	Miaki	Two Boss	LD image	Miaki	Two Boss	LD image	Miaki
		Arnor	GINO	Admiral	Arnor	GINO	Admiral	Arnor	VANS*	Admiral
LI 3	Soda	Lilt	KICK	STAY KOOL	Lilt	KICK	STAY KOOL	Lilt	Sprite*	STAY KOOL
		SANPELLEGRINO	KAS	Sun Drop	SANPELLEGRINO	KAS	Sun Drop	SANPELLEGRINO	KAS	Sun Drop
		Ben Shaws	BARR	TriNa	7up*	BARR	TriNa	7up*	Pepsi*	TriNa
HI 3	Cameras	Delman	PIKKA	Lavell	Delman	PIKKA	Lavell	Nikon*	Pepsi*	SONY*
		JAVIA	Liiwe	Fungo	JAVIA	Liiwe	Canon*	JAVIA	Liiwe	Canon*
		Jonble	COLRY	Sepac	Jonble	COLRY	Sepac	Jonble	COLRY	Sepac
LI 4	Chips	HERR'S	BINGO	DEEP RIVER	HERR'S	BINGO	DEEP RIVER	HERR'S	BINGO	DEEP RIVER
		Crunchips	Soham	Tim's	Crunchips	Soham	Lay's*	Crunchips	Soham	Lay's*
		MISTER	NRG	Good Health	MISTER	NRG	Good Health	Cadina*	NRG	Pringles*
HI 4	Jeans	Tasayu	ENERGIE	nudie	Tasayu	ENERGIE	nudie	Tasayu	EDWIN*	nudie
		DSQUARED2	ANTIK	DENHAM	DSQUARED2	ANTIK	DENHAM	LEE*	ANTIK	DENHAM
		Scota	Sedll	PRPS	Scota	LEVI'S*	PRPS	Scota	LEVI'S*	PRPS
LI 5	Gum	Bazooka	Black Jack	Dentyne	Bazooka	Black Jack	Dentyne	Bazooka	Extra*	Dentyne
		STIMORAL	Kedra	Fruit Stripe	Airwaves*	Kedra	Fruit Stripe	Airwaves*	Kedra	DOUBLEMINT*
		ICE BREAKERS	HOLLYWOOD	Freedent	ICE BREAKERS	HOLLYWOOD	Freedent	ICE BREAKERS	HOLLYWOOD	Freedent
HI 5	Watches	Hanna	Ernest Borel	MIDO	Hanna	Ernest Borel	MIDO	Hanna	Ernest Borel	FOSSIL*
		MANDOUB	VGASY	Canody	MANDOUB	VGASY	CASIO*	SWATCH*	VGASY	CASIO*
		Arseprince	CLAC	EYKI	Arseprince	CLAC	EYKI	Arseprince	CLAC	EYKI
LI 6	Soap	Orchard Queen	NESTI DANTE	Belo	Orchard Queen	NESTI DANTE	Belo	Orchard Queen	NESTI DANTE	Belo
		Beverly hills	Jergens	Safeguard	Beverly hills	Jergens	Safeguard	Beverly hills	Jergens	LUX*
		LOLLIA	CAMAY	LIRIO	Dove*	CAMAY	LIRIO	Dove*	OLAY*	LIRIO
HI 6	Printers	UPPEN	Beauc	Airko	UPPEN	Beauc	Canon*	UPPEN	HP*	Canon*
		Netour	Chez	Techno	Netour	Chez	Techno	Netour	Chez	Techno
		Cecoy	Repiz	Lepuz	Cecoy	Repiz	Lepuz	EPSON*	Repiz	Lepuz

*Indicates advertised brands.

Notes: LI = low-involvement category; HI = high-involvement category.

APPENDIX B

Locations of advertised brands

Low-involvement	High-involvement	Low-involvement	High-involvement
Product display 1[1]	Product display 2	Product display 3	Product display 4
Bottle water 	Backpack 	Cooling underwear 	Canvas shoes 
Product display 5	Product display 6	Product display 7	Product display 8
Soda 	Camera 	Chips 	Jeans 
Product display 9	Product display 10	Product display 11	Product display 12
Gum 	Watch 	Soap 	Printer 

Note. Participants were exposed to 12 product displays. The asterisk indicates where the advertised product was displayed when the shelf featured one advertised product. The shaded boxes where the advertised products were displayed when the shelf featured three advertised products.

APPENDIX C

Price changes for cameras in three different price conditions

Camera	10–15% (NT$4,400–4,600[a]) lower than competitors			Same as the average (NT$ 4,000)			10–15% (NT$3,400–3,600[b]) higher than competitors		
0/9	Delman	PIKKA	Lavell	Delman	PIKKA	Lavell	Delman	PIKKA	Lavell
	Price: 4,480	Price: 4,540	Price: 4,400	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,540	Price: 3,460	Price: 3,600
	JAVIA	Liiwe	Fungo	JAVIA	Liiwe	Fungo	JAVIA	Liiwe	Fungo
	Price: 4,570	Price: 4,430	Price: 4,000	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,400	Price: 3,570	Price: 4,000
	Jonble	COLRY	Sepac	Jonble	COLRY	Sepac	Jonble	COLRY	Sepac
	Price: 4,500	Price: 4,510	Price: 4,460	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,510	Price: 3,430	Price: 3,490
1/9	Delman	PIKKA	Lavell	Delman	PIKKA	Lavell	Delman	PIKKA	Lavell
	Price: 4,480	Price: 4,540	Price: 4,400	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,540	Price: 3,460	Price: 3,600
	JAVIA	Liiwe	Canon*	JAVIA	Liiwe	Canon*	JAVIA	Liiwe	Canon*
	Price: 4,570	Price: 4,430	Price: 4,000	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,400	Price: 3,570	Price: 4,000
	Jonble	COLRY	Sepac	Jonble	COLRY	Sepac	Jonble	COLRY	Sepac
	Price: 4,500	Price: 4,510	Price: 4,460	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,510	Price: 3,430	Price: 3,490
3/9	Nikon*	PIKKA	Sony*	Nikon*	PIKKA	Sony*	Nikon*	PIKKA	Sony*
	Price: 4,000	Price: 4,400	Price: 4,000	Price: 4,000	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,600	Price: 4,000
	JAVIA	Liiwe	Canon*	JAVIA	Liiwe	Canon*	JAVIA	Liiwe	Canon*
	Price: 4,560	Price: 4,480	Price: 4,000	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,480	Price: 3,520	Price: 4,000
	Jonble	COLRY	Sepac	Jonble	COLRY	Sepac	Jonble	COLRY	Sepac
	Price: 4,520	Price: 4,600	Price: 4,440	Price: 4,000	Price: 4,000	Price: 4,000	Price: 3,440	Price: 3,560	Price: 3,400

[a]4000 * 1.10 = 4400; 4000. * 1.15 = 4600.

[b]4000 * 0.85 = 3400; 4000 * 0.90 = 3600.

*Indicates advertised brands.

Note. The product displays in the "same as the average" column were what appeared in the pilot study.