MIS Quarterly

BRAND POSITIONING STRATEGY USING SEARCH ENGINE MARKETING[1]

By: **Wenyu Dou**
Department of Marketing
City University of Hong Kong
Tat Chee Avenue
Kowloon
HONG KONG SAR
mkwydou@cityu.edu.hk

Kai H. Lim
Department of Information Systems
City University of Hong Kong
Tat Chee Avenue
Kowloon
HONG KONG SAR
iskl@cityu.edu.hk

Chenting Su
Department of Marketing
City University of Hong Kong
Tat Chee Avenue
Kowloon
HONG KONG SAR
mkctsu@cityu.edu.hk

Nan Zhou
Department of Marketing
City University of Hong Kong
Tat Chee Avenue
Kowloon
HONG KONG SAR
mkzhou@cityu.edu.hk

Nan Cui
Department of Marketing
Wuhan University
Wuhan
CHINA
nancui@whu.edu.cn

Abstract

Whether and how firms can employ relative rankings in search engine results pages (SERPs) to differentiate their brands from competitors in cyberspace remains a critical, puzzling issue in e-commerce research. By synthesizing relevant literature from cognitive psychology, marketing, and e-commerce, this study identifies key contextual factors that are conducive for creating brand positioning online via SERPs. In two experiments, the authors establish that when Internet users' implicit beliefs (i.e., schema) about the meaning of the display order of search engine results are activated or heightened through feature priming, they will have better recall of an unknown brand that is displayed before the well-known brands in SERPs. Further, those with low Internet search skills tend to evaluate the unknown brand more favorably along the particular brand attribute that activates the search engine ranking schema. This research has both theoretical and practical implications for under-

standing the effectiveness of search engine optimization techniques.

Keywords: e-commerce, search engine optimization, web design, brand positioning

Introduction ▮▮▮▮▮▮

> *John and Sally were planning a vacation to celebrate their 25ᵗʰ wedding anniversary. One night, after watching a series of TV advertisements launched by the Bahamas Tourism Bureau about luxury vacations in the Bahamas, they decided that they wanted to go to the Bahamas. With high spirits, John went to the Internet and typed "luxury hotels in Bahamas" in Google. When he browsed the first page of search results, he noticed that the first hotel shown was Ranai, followed by Marriott, Hilton, and Four Seasons. The unknown brand Ranai quickly caught John's attention, because it was displayed before three famous luxury hotel brands. John, who is not a sophisticated Internet searcher, thought that Ranai should be a pretty luxurious hotel—otherwise, it could not have been displayed by Google as the first search result.*

Online information search is a ubiquitous and critically important activity in e-commerce (Gefen and Straub 2000). Search engines occupy a prominent position in the online world; more than half of all visitors to web sites now arrive there from a search engine rather than through a direct link from another web page (Introna and Nissenbaum 2000; Telang et al. 2004). Along with the increasing importance of searches, search engines play greater roles as critical links between firms that use the Internet to build their images and their target customers (Wu et al. 2005). Companies' spending on search engine marketing is growing faster than spending on other online advertising means and analysts estimate that search engine marketing spending soon will capture a lion's share of the online advertising pie (Garside 2007), the key growth sector for e-commerce activities (McCoy et al. 2007).

A stream of research within the information systems domain considers how information display formats can influence IS users' decisions and behaviors (e.g., Benbasat and Dexter 1985; Jarvenpaa and Dickson 1988; Kumar and Benbasat 2004; Tan and Benbasat 1990, Zhang 1998). In turn, e-commerce studies have examined how information display format might influence consumers' online buying behaviors (e.g., Hogue and Lohse 1999; Hong et al. 2004; Jiang and

Benbasat 2007). Despite the importance of information display formats, a specific aspect pertaining to the order of search engine results pages on user behavior has yet to receive significant attention (Evans 2007). Practitioner literature reveals that the display order of search engine results could help shape brand perceptions (e.g., Drèze and Zufryden 2004; Hansell 2005). Therefore, by extending research into the influence of display format in IS, this study aims to pinpoint another route, namely, the display order of search engine results, through which display format could have significance for e-commerce firms.

From the perspective of web vendors, the application of search engines as powerful e-commerce tools can be wide ranging, from extending public relation functions (*New Media Age* 2007) to helping enterprises sell to a global audience (Lalisan 2007), to promoting small, local stores inexpensively (O'Connell 2007), and to building brands (*Media* 2007). In this study, we focus on a specific aspect of search engine marketing, the display order of search results, and examine whether web vendors, especially those that are relatively unknown, can differentiate their brand offerings by optimizing their web sites' display order in search engine results pages (SERPs).

Despite the increasing importance and rising popularity of search engines, attention pertaining to search engine effectiveness largely centers on the number of clicks generated (Kitts and LeBlanc 2004), although ample evidence suggests that some advertisers (e.g., cosmetics makers, beverage producers) are more interested in the branding impact of search results than actual clicks on their web sites (*Economist* 2006). Some industry observers even proclaim that search results can help build awareness, regardless of whether people click on them (Hansell 2005). If search engines can help shape Internet users' brand perceptions simply by exposing consumers to search results, they have profound implications for companies eager to gain exposure through the so-called "gate to the Internet" (Laffey 2007). However, thus far, companies have been relying mostly on click metrics, a measurement tool plagued by fraud (Bannan 2007).

The issue of whether search engine results actually influence Internet users' brand perceptions also remains unresolved (Thurow 2006b), despite preliminary evidence in industry reports (Internet Advertising Bureau 2004). In particular, despite conjectures about the brand-building capability of top-ranked search results for unknown brands (Lee 2006), the hypothesized effect has never been explored from a theoretical perspective. Such an investigation could enrich our understanding of how and why search engine results contribute to firms' online promotions in an e-commerce setting,

especially for relatively unknown brands or newly created online stores (O'Connell 2007). Toward this end, we investigate how the display order of SERPs may affect Internet users' recognition and perception of unknown brands. By delineating the underlying cognitive mechanisms through which display order effects on brand evaluations occur in SERPs, we contribute to the burgeoning field of research into the roles of search engines in e-commerce (Jansen and Molina 2006; Jansen and Resnick 2006). From a managerial perspective, our finding lends credible support to the prevalent viewpoint that the Internet can level the playing field for firms (Saban and Rau 2005) through search engine marketing efforts, whether large or small.

We structure the rest of this article as follows: We begin by introducing search engine marketing and then derive predictions about how search engine result rankings might affect Internet users' perceptions of an unknown brand by considering three key variables of theoretical and substantive interest: (1) Internet users' schema about search engine result rankings, (2) Internet search skills of users, and (3) the activation of search engine ranking schema when Internet users are primed to search for brands using a particular product attribute. We report the results from two controlled experiments that test the hypotheses developed and conclude with a discussion of the implications of our findings.

Search Engine Marketing in E-Commerce

Search represents one of the most important activities for Internet users (Pavlou and Fygensen 2006). An overwhelming majority of users search for information about goods and services on a regular basis and more than half of Internet traffic begins with a search engine (Nielsen// NetRatings 2006). Although the exact algorithms used differ across search engines, major players in the field (e.g., Google) rank and display search results by taking into account the similarity of a web site's content to the users' query, as well as the absolute "authority" of the site (Gori and Witten 2005), which often relates to how many high-quality web sites link to the focal site in the search engine.

In an e-commerce setting, two types of marketing activities can be conducted through search engines. First, in search engine advertising, companies pay to have links to their web sites displayed in the "sponsored section" of a search engine results page. Second, in search engine optimization, companies strive to push the rankings of their web sites higher in the *organic* search results (i.e., no payment made to the search engine) through a variety of techniques (e.g., changing the

structure of the sites) or by hiring external consultants to develop specific techniques that will cause search engines to index their sites in higher positions (Delaney 2006).

Search engine marketing originally employed a direct-response model,[2] but web designers are recognizing that search results can have branding implications as well (Wasserman 2006), because the results offer a natural way for Internet users to gather information about brands (Browne et al. 2007). For example, a report by the Internet Advertising Bureau (2004) demonstrates the branding impact of search engine results in enhancing awareness of brands. In an online retail setting, vendors find that in addition to generating direct traffic by clickthroughs, search engine marketing can improve their brand profiles (Jones 2006). Many companies believe that even if a user does not click on the site link, he or she may gain a positive branding experience. This effect may be especially pertinent for the top-ranked results, because, like John in our opening scenario, the user may believe the company must be outstanding or trustworthy in some way to be listed at the top of major search engines such as Google, Yahoo, or MSN Search (Thurow 2006a). Not surprisingly, industry observers argue that companies should pursue organic search rankings if their goal is to obtain a long-term, sustainable branding impact (Noaman 2006).

Search engine marketing also may level the playing field for small and medium-sized enterprises (SMEs) with unknown brands, because well-known, "big" brands do not necessarily own the top positions in SERPs (Fusco 2006). With effective search engine marketing or optimization techniques, relatively unknown brands can appear ahead of well-known ones. This phenomenon may occur for a number of reasons. For example, companies with big brands may have failed to develop a coherent search engine marketing strategy due to complacency or lack of competitive vigilance on the search engine marketing scene (Fusco 2005). Further, these companies may not have paid enough attention to web site structural problems that can impede higher rankings (Fusco 2006).

Contextual Effects in Brand Evaluations

Studies in consumer research posit that brand evaluations reflect consumers' direct experience with or specific information about a brand (Simonin and Ruth 1998). However, contextual (or situational) factors also may influence such evaluations, perhaps by engendering constructive processing

---

[2]This model emphasizes the number of clicks generated from search results.

(Wilson and Hodges 1992). According to this view, consumers retain in their memories an extensive database of information about previously stored attitudes. Contextual factors can change these attitudes by influencing which types of information they consider relevant or diagnostic for the task, as well as their interpretations of that retrieved information (Feldman and Lynch 1988). The notion of context-induced constructive processing provides the conceptual foundation for this research, in which the ranked search engine results constitute a unique context for evaluating brands in the list.

Studies in this field investigate a broad range of contextual factors that may affect focal brand evaluations; for example, consumers may change their evaluations of a focal brand depending on how the top- and second-tier brands are displayed relative to each other on retail shelves (Buchanan et al. 1999). Although prior research highlights the influence of various contextual factors on brand evaluations, no studies investigate search engine platforms as a new context for online brand evaluations—although industry observers proclaim vast similarities between search engine result displays and retail shelf displays (Lee 2006).

Following similar reasoning used to explain the effect of retail display format on consumers' brand evaluations (Buchanan et al. 1999), we argue that Internet users maintain specific beliefs about how search engines operate and the meaning of search result rankings; therefore, they may perceive that the display order of the search engine results indicates how the search engine sorts the results according to the search attribute.

In the following sections, we conceptualize how information display order as a key contextual factor in SERPs may influence brand evaluations and how such an effect is moderated by Internet users' search skills. We posit that this effect likely occurs through the activation of Internet users' search engine ranking schema. In this regard, we also discuss how a commonly used cognitive mechanism, *priming*, can be applied to activate search engine schema.

Information Display Format in E-Commerce

A stream of research reveals that the way information is displayed can influence human decision-making processes by affecting the ease with which various decision processes are carried out (e.g., Bettman et al. 1986; Jarvenpaa and Dickson 1988). According to Kleinmuntz and Schkade (1993), there are three fundamental characteristics of information display: the form of the individual information items, the organization of the displayed items into meaningful groups, and the

sequence of individual information items. Among these three display features, sequence (or order) significantly influences the way information gets processed (Hogarth and Einhorn 1992; Russo and Rosen 1975).

Practical evidence also suggests that sequence may have important implications for information processing. A classical example is the lawsuit brought by other airlines against American Airlines, whose Sabre reservation system allegedly featured American Airlines' flights at the top of the screen. Yet relatively fewer studies consider the possible effects of sequence in information display literature (Kleinmuntz and Schkade 1993), especially in an e-commerce setting. One notable exception is Hogue and Lohse (1999), who find that when using an electronic directory, users are more likely to choose advertisements at the top of the results list than they would in traditional paper-based directories. Nonetheless, no study to date has investigated the role of sequence in the web site context. This study seeks to fill this void by investigating the sequence of information displays in SERPs.

Internet Users' Schema of Search Engine Display

A schema refers to preexisting constellations of (implicit) knowledge, beliefs, and expectations stored in memory (Taylor and Crocker 1981). Schemas can affect memory by acting as frameworks that integrate old and new knowledge (Brewer and Nakamura, 1984). Schema also plays a significant role in judgment and preference formation in many areas, including IS applications (Khatri et al. 2006). When making purchase decisions, consumers act as if they have schemata for different brands or services, because they possess interconnected beliefs, emotions, facts, and perceptions stored in their memory as a unit (Batra and Homer 2004). For example, consumers have schemata that relate positioning to marketing mix decisions (e.g., "better brands are found in better stores"; Pham and Johar 1997), which guide their judgments of marketing stimuli (Buchanan et al. 1999).

A growing list of evidence[3] suggests that Internet users may hold a schema (implicit knowledge) about the results rankings in SERPs, such as that display prominence indicates brand strength, just as they hold a schema about the meaning of retail shelf displays (Lee 2006). In particular, Internet users expect the most relevant sources to be listed at the top of a SERP and may have been conditioned to consider the ranking

---

[3]The existence of Internet users' search engine ranking schema also received support from the comments of Internet users who participated in the focus group investigations that were part of this study.

of search results as indicative of the degrees of relevance to their search terms (Rowley 2004)—just as in our opening scenario, John was inclined to think that his search results about luxury hotels in the Bahamas were somehow ranked along the luxuriousness dimension. An industry survey indicates that a substantial portion of Internet users believe that companies whose web sites appear at the top of SERPs are the top companies in that field (iProspect 2006). This kind of search engine rankings schema also has been detected in a study conducted by Enquiro (2007), which indicates that when potential car buyers were asked to search for fuel-efficient cars, Honda, as a test brand, was perceived as more fuel efficient when it appeared in the top position compared with when it was not shown in the first page of a Google SERP.

Although ample evidence indicates that a search engine ranking schema exists as implicit knowledge (Higgins and King 1981), any schema must be activated in working memory before Internet users can use it to evaluate the search results (see Brown and Dittmar 2005; McClelland and Rumelhart 1985). In a given setting, a person's particular, relevant schema may become activated into working memory, with other unrelated schemata receding into the background, depending on the decision context (McClelland and Rumelhart 1985). Schema activation may occur when people receive exposure to a particular set of cognitive stimuli (Anderson 1996; Gilbert and Hixon 1991), of which one of the most effective is priming (Berkowitz and Rogers 1986).

Priming and Schema Activation

The schema literature suggests that individuals hold various schemata about different things in everyday life (Domke et al. 1998), for example, going to the dentist, retail display arrangement of brands, etc. Individuals do not draw upon all applicable cognitive schemata to guide information processing; rather, they tend to rely on the schema that is most accessible at the decision point (Higgings et al. 1985; Higgins and King 1981). Since schematic knowledge is stored in people's long-term memory (Higgins and King 1981), scholars (e.g., Tourangeau and Rasinski 1988; Zaller 1992; Zaller and Feldman 1992) have indicated that certain types of cognitive mechanisms (e.g., priming) could be applied to activate a schema and bring it to the short-term working memory (Wyer and Srull 1981), which then becomes accessible for guiding information processing and judgment formation. This notion about the importance of priming in activating schema has received broad empirical support (e.g., Brown and Dittmar 2005; Garramone 1992; Smith-Janik and Teachman 2008).

In psychology, *priming* refers to the process of activating parts of particular representations or associations in memory just before carrying out an action or task (Higgins and King 1981). As a cognitive stimulus, priming provides an effective cognitive mechanism that can activate a user's previously stored schema and increase the accessibility of existing information in memory (see Mandel and Johnson 2002). This study focuses on a particularly relevant category of priming—namely, *feature priming*—which stipulates that a brand feature gets weighted more heavily in evaluations if the subject has been exposed to a prime associated with that particular feature (Yi 1990), such as through media exposure or interpersonal influence.

In an online search context, an Internet user (e.g., John from our opening scenario) might be primed by the concept of *luxury* after watching a series of TV advertisements about romantic vacations in the Bahamas Islands. In this case, the TV advertisements serve as a feature prime that can activate the implicit knowledge John holds about the meaning of search engine results rankings: Hotels will be displayed according to their relative strength in terms of the primed brand attribute, their luxuriousness.

When such schema-based expectations are violated, people engage in constructive processing to resolve the discrepancies (Meyers-Levy and Tybout 1989), such as when an unknown brand appears before well-known brands in SERPs (especially on the first results page, which commands the most attention). This piece of information appears incongruent, because Internet users normally expect to see more well-known brands displayed first in SERPs (Buchan 2006; Lee 2006). Incongruency literature maintains that little elaboration occurs when information is congruent, whereas incongruency triggers cognitive elaboration (Mandler 1982), which makes incongruent information more memorable, because it prompts attention and provokes elaboration (Heckler and Childers 1992; Sujan et al. 1986). The underlying cognitive mechanism for this phenomenon can be traced to the associated memory theory, which holds that human beings organize concepts as nodes in a memory network, and that associations among concepts in memory are equivalent to the links between nodes in the memory network (Srull and Wyer 1989). When individuals encounter schema-inconsistent information that does not fit their expectations (e.g., unknown brands displayed on top of well-known brands in SERPs), they will attempt to retrieve additional information from their long-term memory to develop an understanding of this inconsistent information. The additional elaborative effort increases the number of associative paths stored in memory, which subsequently enhances the memory of this incongruent information (and hence the unknown brand).

Integrating the preceding discussion, we argue that when Internet users' search results ranking schema gets activated, an unknown brand displayed before well-known ones in a SERP should capture the users' attention more, which will result in their enhanced memory (e.g., recognition[4]) of the unknown brand. In comparison, the recognition advantage should not emerge in the absence of search engine ranking schema activation (i.e., no priming condition). Therefore,

> H1a: *In the search engine ranking schema activation condition (via priming), recognition of an unknown brand is higher when it is displayed before well-known brands in SERPs compared with when it is displayed after them.*

> H1b: *The recognition advantage for an unknown brand displayed before well-known brands in SERPs is more pronounced in the schema activation condition (via priming) than in the no-schema-activation condition.*

Search Engine Ranking Effect on Brand Evaluations

Schema-driven elaborations tend to distort information, such that inconsistent information becomes consistent with the schema (Alba and Hasher 1983; Tesser 1978). Specifically, an assimilation effect may occur as people essentially assimilate, or bias, the prime into their attitudes (Higgins et al. 1985; Sherif and Hoveland 1961). This particular mechanism can be explained by the storage bin model, which proposes that a recently primed brand attribute is stored at the top of people's mental storage bins (Wyer and Srull 1981). Hence, people are more likely to consider this easily accessible brand attribute first when they attempt to decode subsequent new information.

In our research context, when an Internet user's search engine ranking schema gets activated through priming of a particular brand attribute (e.g., luxuriousness of hotels), the primed construct becomes more accessible in the user's working memory. When an unknown brand appears before well-known ones in SERPs, the assimilation effect then stipulates that users reshape (or bias) their perceptions of the unknown brand by elevating their brand evaluations along the primed brand attribute (e.g., luxuriousness). Specifically, there are

three possible ways Internet users can make incongruent information more consistent with their existing search engine display schema: (1) redirect elaborations toward consistent associations that are not as salient initially (e.g., the unknown brand X could be a luxury brand that I was not aware of before), (2) reduce the inconsistent cognitions (i.e., is it possible that brand X actually belongs to the top league of luxury brands?), and (3) reinterpret cognitions such that they are more evaluatively consistent (i.e., I know that Brands A, B, and C are all luxury brands in this product category, and now I can see that brand X is displayed even on top of them in the SERP; therefore, Band X must be a luxury brand as well) (Lane 2000).

However, psychology literature also suggests that the usefulness of priming in contextual decision making may be limited by users' expertise with the decision context (Alba and Hutchinson 1987; Mandel and Johnson 2002). Therefore, novices in the decision context should be more susceptible to the influences of priming than experts would be. The argument in support of this assertion posits that experts, with their elaborate knowledge structure, can afford more complex inferential processing (Alba and Hutchinson 1987; Mitchell and Dacin 1996). In particular, experts typically possess a variety of easily accessible subcategories in their knowledge structures that they can invoke to account for information that is not represented in the initially activated schema (Alba and Hutchinson, 1987). Consequently, experts' evaluations are not easily influenced by the schema-congruity thoughts observed for novices (Peracchio and Tybout 1996).

The importance of the knowledge construct in schematic processing prompts us to explore a key knowledge structure that should be instrumental in our research context, that is, Internet users' online search skills, which vary considerably (see Aula and Nordhausen 2006; Hargittai 2002). The IS literature suggests that users differ in their computer self-efficacy, which refers to people's judgment of their own capabilities to use computers in diverse situations (e.g., Compeau et al. 1999; Marakas et al. 1998). Applying this concept to the Internet use context, Torkzadeh et al. (2006) find that Internet users' self-perceptions and self-competency in interacting with the Internet tend to improve after they use various functions of the Internet, including search engines for online information searches. Furthermore, IS decision-making literature suggests that experts have greater ability in judging the suitability of certain information processing strategies than do novices (see Arnold et al. 2006). Echoing this line of reasoning, we posit that some Internet users are more knowledgeable about how search engine rankings are produced—that firms can use various tactics to move up their rankings in SERPs—than are other users.

---

[4]In this study, we adopt the view of communication researchers that recognition provides a better measure of exposure to advertising stimuli (Shapiro 1994; Slater 2004).

Integrating the discussions about display order and Internet search skills under the influence of priming, we predict a three-way interaction effect for brand evaluations in SERPs. When Internet users get primed to search along a particular brand attribute (e.g., when John searched for luxury hotels after he was primed by watching *a series of TV advertisements* about luxury vacations), their search engine ranking schema should be activated under the influence of priming (i.e., search results appear ranked according to the luxuriousness of hotels). In this context, when users encounter an unknown brand displayed before well-known brands in a SERP, they will assimilate this schema-inconsistent information (Higgins et al. 1985) and bias (or elevate) their evaluations of the unknown brand along the primed attribute. This effect of priming is moderated further by Internet users' search skills such that those low in search skills are more susceptible to the priming influence. In a two-way interaction, search skills and display order jointly affect brand attribute evaluations, such that users with low search skills (compared with those with high search skills) tend to elevate the unknown hotel more positively along the primed brand attribute. Obviously, there is no reason to believe that the proposed effect should emerge for any unprimed brand attribute. Hence,

> H2a: *Under the condition of search engine ranking schema activation (via priming), a two-way interaction exists between display order and Internet search skill on brand evaluations, such that those with lower search skills evaluate an unknown brand more highly when it is displayed before well-known brands in SERPs than when it is displayed after them*.

The preceding discussions on schema activation mechanism also stipulate that the implicit search engine ranking schema must be activated and made accessible (e.g., via priming) before it can enter the Internet user's working memory and be used in the subsequent decision task. Thus, the two-way interaction effect of display order and search skill on brand evaluation should not occur in the absence of search engine schema activation, as represented by the no-priming condition. Hence,

> H2b: *The activation of search engine ranking schema (via priming) moderates the interaction effect of Internet search skills and display order on brand evaluation in SERPs. Specifically, the interaction effect of search skills and display order on brand evaluation in SERPs is stronger in the priming condition than in the no-priming condition.*

We illustrate our overall theoretical model in Figure 1. In the next section, we present experiment 1, which tests the hypotheses for the priming condition with a special focus on verifying the existence of schema activation and how priming can activate search engine ranking schema. We follow up with experiment 2, which extends the scope of our investigation to vary the level of schema incongruity and includes a no-priming condition.

Experiment 1

We recruited the participants in Experiment 1 using an e-mail announcement system that broadcasts messages to the campus community of a university in Hong Kong. Student samples are suitable if they are reasonably familiar with the domain under investigation (Gordon et al. 1987); we confirmed that students met this criterion with pretests. We disguised the goal of the study, calling it "Internet life of Hong Kong residents," and each study participant received a HK$100 gift certificate from a local supermarket after successfully completing the study. E-mail recipients who expressed interest could sign up online for the experiment if they were regular Internet users and had reached their senior year or beyond. The qualified respondents then completed an online questionnaire consisting of a variety of items pertaining to their demographics, common online activities, and Internet search skills; this pre-study questionnaire actually provides measures of each participant's Internet search skills. The largest group of participants, 73 percent, were senior-level undergraduates; 21 percent were graduate-level students; the remaining 6 percent were university staff.

Stimuli

We developed a simulated Google search engine in our pretest that appears just like the real Google search engine (see Appendix A), except that we manipulated the search results for the study's purpose.[5] In addition, because this study relates to the branding effect of organic search listings, we eliminated sponsored listings in the experimental SERPs. This type of stimuli (i.e., simulated Google search engine interface) is employed in experiment 2 as well.

---

[5]To control for potential confounding effects, we conducted a pretest of the titles and site descriptions of the top three search results; a separate group of students from a university in Hong Kong judged them as similar.
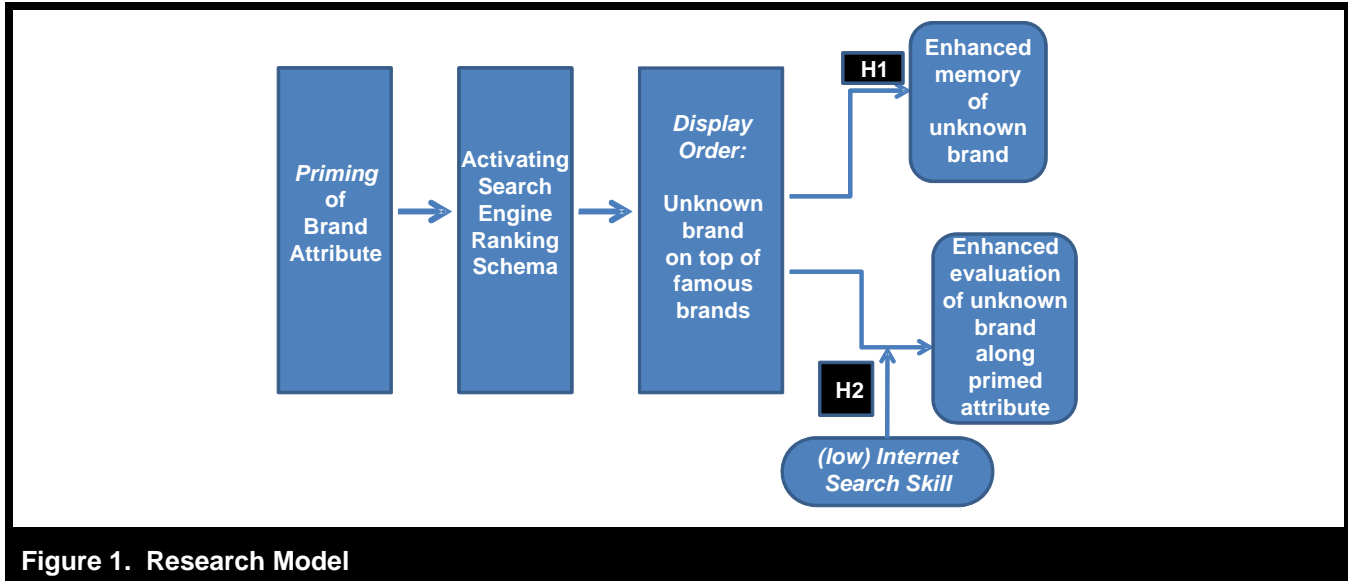
Figure 1. Research Model

A separate test, consisting of a focus group study and a questionnaire survey, enables us to select the appropriate experimental stimuli for the main experiments. On the basis of the familiarity scores from the pretest, we chose three well-known backpack brands (Columbia, Gregory, and Nike). In addition, based on the input from a focus group before the experiment, we chose "heavy-dutiness" as a key evaluative brand attribute for backpacks.

Method

The study setting consists of a computer laboratory equipped with high-speed Internet access. We randomly assigned subjects to one of the two experimental conditions. In condition 1, an unknown backpack brand (Kurton, a fictitious brand[6]) appeared first, before the three well-known backpack brands (Columbia, Gregory, and Nike). In condition 2, Columbia appeared first, followed by Gregory, Nike, and then Kurton. Each SERP displayed eight search results (Appendix A): four above the fold on a 17 inch monitor screen, and four others below that pertained to buying or reviewing heavy-duty backpacks but not to any particular brand. We specifically instructed participants to browse the first page of the SERP without clicking on any results; as confirmed by pretests, they had sufficient time to browse the search results. Using a median split of their scores on the Internet search skills scale

(Novak et al. 2000),[7] we classify the participants into low (M = 4.03, n = 59) and high (M = 5.64, n = 58) Internet search skills groups (t (115) = 15.22, *p* < .001).

Procedure

The study thus uses a 2 (display position of the unknown brand: first versus fourth) by 2 (high versus low search skills) between-subjects design. In the beginning of the experiment, we primed participants to think about the heavy-dutiness of backpacks by presenting them with a study scenario. First, one of the researchers gave a five-minute talk to the study participants about the importance of equipment durability in outdoor tours. Next, participants were asked to read the following search text description shown on the computer screen, which was surrounded by photos of travelers carrying weights and walking in rugged terrain:

> *Now we want you to imagine that you are planning a tour with your friends during the upcoming semester break to relax after a year's hard work. You decide to take **an outdoor jogging trip to the Hong Kong suburbs.** Of course, there are many things that you must carefully prepare for the tour, such as a heavy-duty backpack to carry all the heavy*

---

[6]All fictitious brand names used in this study were pretested, and we affirmed that they did not carry any special connotations for study participants.

[7]A separate test with 52 subjects with similar demographic profiles indicates that an objective measure of users' Internet search skills (i.e., number of correct answers obtained in a seven-question test) correlates well (r = .72) with the subjective measures we used.

stuff needed in the tour. As a smart consumer, your first step is to conduct a pre-purchase information search before making your decision. So you go to the Internet first.

Participants performed two filler tasks[8] before the actual experiment: (1) search and browse information about portable DVD players at a brand comparison web site (smarter.com) and (2) search and browse consumer opinions about "travel to Seoul" at a consumer review web site (epinions.com). In each filler task, participants browsed, with no further clicking of the results allowed, before answering a number of questions, such as whether each search result for the Seoul travel site was accompanied by a picture. The filler tasks also served to familiarize participants with the study's rule that they could view results onscreen but not click further on the results. The main experimental task involved their search for heavy-duty backpacks.

Dependent and Independent Measures

Following similar procedures in consumer research (Kumar and Krishnan 2004), we collected measures of recognition by asking each participant to indicate whether he or she could recognize the focal, unknown brand among a list of three other fictitious backpack brands, scoring 1 for recognition and 0 for nonrecognition. We also collected perceptions of Kurton's heavy-dutiness (primed attribute), and perceptions of its stylishness (unprimed attribute[9]). Table 1 presents the descriptive statistics for key measures in experiment 1. The scale items and reliability of the scale measures appear in Appendix B.

Results

Manipulation Checks

Participants indicated the degree to which they agreed with the following statement on a 1 (strongly disagree) to 7 (strongly agree) scale: "The Google search results for heavy-duty backpacks are typical of Google search results" (M =

---

[8]The two filler tasks lasted about 15 minutes. Hence, we consider that they should be adequate in masking any explicit influence of the priming procedure on brand evaluations collected in a totally different task (Strack 1992; Wegener and Petty 1997).

[9]The purpose of the unprimed brand attribute is to serve as a control for the primed attribute.

5.35). The rating indicates that participants considered the study scenario realistic and typical of online searches.

Recognition

Of the 63 participants in condition 1 (unknown brand first) and the 61 participants in condition 2 (unknown brand fourth), 33 and 18, respectively, correctly recognized the focal, unknown brand. The recognition proportion in condition 1 is significantly higher than that in condition 2 (52.4 percent versus 29.5 percent, $z = 2.59$, $p < .01$), indicating strong support of H1a.

Heavy-Dutiness

As hypothesized in H2a, we detect a significant interaction effect (see Figure 2) of display position and Internet search skills on the evaluation of the heavy-dutiness of Kurton ($F(1,113) = 11.39$, $p < .01$) in an ANOVA test (Table 2). Using a simple effects test, we find that participants with low search skills tend to evaluate Kurton as more heavy duty when it is displayed first ($M_{first-position} = 5.39$) than when it appears in the fourth position, after three well-known backpack brands ($M_{fourth-position} = 4.56$; $F(1,113) = 16.96$, $p < .01$). Participants with high search skills show no significant difference ($F(1,113) = .45$, $p = .50$) in their evaluations of the heavy-dutiness of Kurton whether it is displayed first ($M_{first-position} = 4.95$) or fourth ($M_{fourth-position} = 5.09$). These results are consistent with the prediction of H2a.

Stylishness

We find no significant interaction effect of display position by Internet search skills in the evaluation of the unprimed attribute, stylishness ($F(1,113) = 2.26$, $p = .14$). Because this dimension is irrelevant to the primed attribute of heavy-dutiness, this result corroborates our prediction in H2a.

Discussion

Experiment 1 provides compelling evidence that display order influences branding perceptions for an unknown brand in SERPs, especially when users are primed to approach their search with the particular brand attribute in their working memory. First, recognition of the unknown backpack brand increases significantly when it appears in the first position, before three well-known brands, in support of H1a. Furthermore, because we do not detect any significant recognition

Table 1. Descriptive Statistics of Variables		
Construct	**Mean**	**Standard Deviation**
Heavy-dutiness	4.99	0.83
Stylishness	4.65	0.91
Internet search skill	4.83	0.96

Note: All scales are from 1 to 7.

Table 2. ANOVA Summary: Brand Evaluations of Backpack Heavy-Dutiness				
Source	**df**	**Mean Square**	**F**	**Sig.**
Between-subjects				
Display position	1	3.56	5.85	0.02
Search skill	1	0.07	0.12	0.73
Display position × Search skill	1	6.92	11.39	.00

Note: All scales are from 1 to 7.
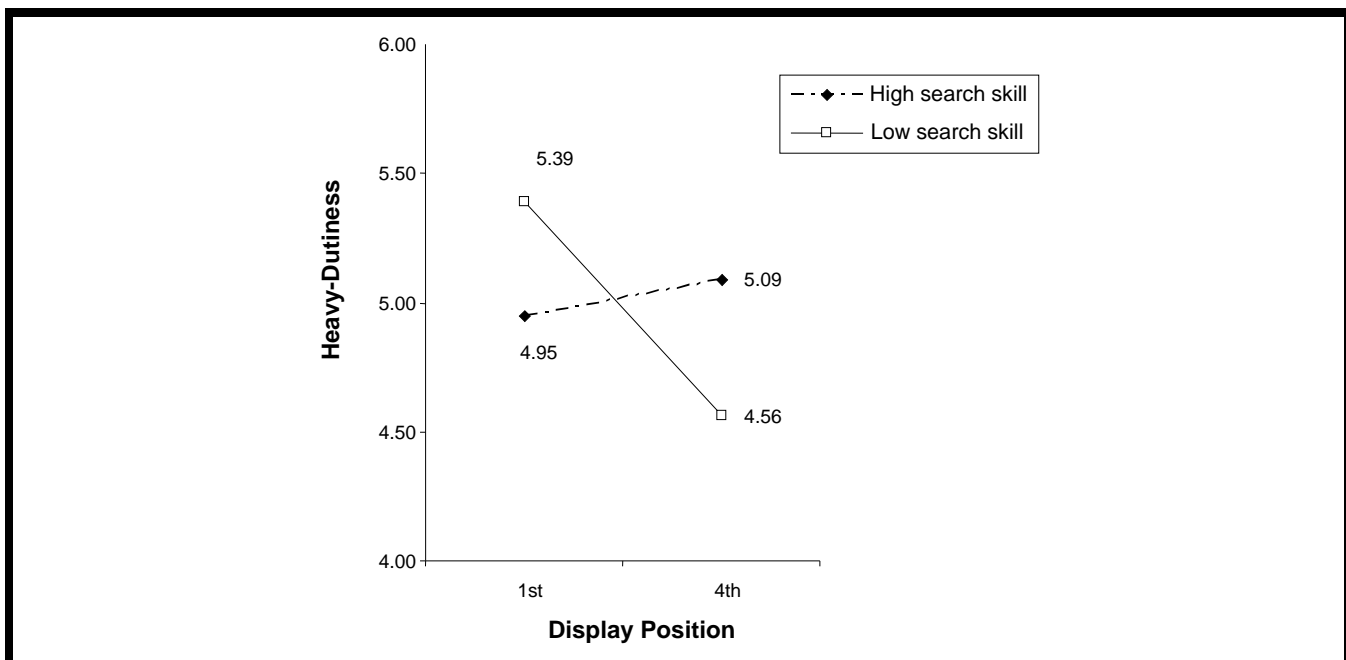
Figure 2. Interaction of Display Position and Internet Search Skill (Experiment 1)

differences between respondents with high and low Internet search skills,[10] we confirm our prior expectation that the unknown brand in the top position attracts the attention of both groups of Internet users equally. Second, we find a significant interaction effect between display order and

Internet search skills on users' evaluations of the unknown brand along the primed brand attribute (but not along the unprimed attribute). In particular, consistent with H2a, participants with low Internet search skills perceive the unknown backpack brand as more heavy-duty when it appears before three well-known backpack brands. Also consistent with H2a, those with stronger Internet search skills do not differ significantly in their brand perceptions of the unknown brand

---

[10]$t(115) = 1.02$, $p > .05$. This finding is also confirmed in experiment 2.

on the primed dimension, regardless of the order in which it appears.

We also conducted a follow-up experiment as part of experiment 1 to verify the significance of Internet users' search engine ranking schema. Specifically, we asked a separate group of respondents (n = 56, with a similar demographic profile) to read an article (supposedly from *Business Week,* see Appendix C) about search engine optimization gimmicks that firms can use to manipulate their rankings artificially in search engines. The article thus espouses the view that search engine result rankings do not necessarily reflect the relevancy of the results to users' search keywords. We then asked the participants to go through experimental procedures similar to those in experiment 1 to determine if they differ in their recognition of the unknown backpack brand when it is displayed before or after well-known backpack brands. The results suggest no significant recognition advantage for the unknown brand, regardless of its display position (46.4 percent versus 42.9 percent, z = .27, *p* > .05). Thus, this *post hoc* test attests to the existence and importance of search engine ranking schema.

Although experiment 1 offers convincing evidence in support of our hypotheses regarding search engine display effects for an unknown brand when Internet users' search engine ranking schema is activated via priming, we recognize that several issues require further exploration. First, previous research (e.g., Mandler 1982) finds that the level of incongruity between an information cue and a schema may affect how the information cue gets processed using the schematic knowledge. Thus, it seems relevant to examine whether a manipulation of the level of schema congruity could affect the results. Instead of placing the unknown brand ahead of three well-known brands, as in experiment 1, we use a different manipulation of schema incongruity in experiment 2 and place the unknown brand ahead of just two well-known brands. Second, although our results are convincing in a priming-induced schema-activation condition, a more comprehensive hypothesis test requires running an experiment under concurrent conditions of priming and no-priming so as to establish unequivocal support for the hypotheses. Third, we intend to establish the generalizability and robustness of our findings by examining a different brand category. We address these three issues in experiment 2.

Experiment 2

A separate test, consisting of a focus group study and a questionnaire survey, enabled us to select the appropriate experi-

ment stimuli for experiment 2. Again, the goal of the study was disguised as to understand "Internet life of Hong Kong residents." On the basis of the familiarity scores, we chose hotels in Chiang Mai, Thailand, as a brand category and two well-known upscale hotel brands (Hilton and Shangri-La) in that category. In addition, we used luxuriousness as the key evaluative attribute. A fictitious brand name, "Narai," represents the focal, unknown, luxurious hotel brand. Each SERP displayed seven search results: three above the fold on a 17 inch monitor screen and four additional results (e.g., Chiang Mai Tourism Bureau) related to travel information about Chiang Mai but not to any particular hotel brand.

We manipulated two treatment conditions to display the unknown brand. In condition 1, the unknown Narai hotel brand appeared in the first position, followed by links to Hilton (second) and Shangri-La (third). In condition 2, the links to Hilton (first) and Shangri-La (second) appeared before the link to Narai. Using the same median split of scores on the Internet search skills scale as in experiment 1, we classified the 240 study participants into high (M = 5.29, n = 123) and low (M = 3.60, n = 117) Internet search skills groups (t(238) = 19.22, *p* < .001).

Procedure

Experiment 2 adopts a 2 (priming versus no priming) by 2 (display position of unknown brand: first versus third) by 2 (high versus low search skills) between-subjects design. In the no-priming condition, the instructions simply asked participants to search for information about "hotels in Chiang Mai, Thailand" using Google. In comparison, participants in the priming condition first heard a five-minute talk about luxury vacations, given by one of the researchers, then read a brief motivational text, which was surrounded by images of amenities commonly associated with luxury hotels, about travel to Chiang Mai, Thailand:

> *Now we want you to imagine that you have just won HK$10,000 in a lottery and you are very excited about this windfall. You decide to spend the money in pampering yourself. You decide to go to a popular travel destination country for Hong Kong residents—Thailand. In particular, you want to explore the beautiful scenery of Chiang Mai while enjoying the royal-like amenities in luxury hotels there. As a smart consumer, your first step is to conduct a pre-purchase information search before deciding on which hotel to stay. So, you go to the Internet first.*

They then searched for "luxury hotels in Chiang Mai, Thailand"[11] using the simulated Google. The subsequent experiment procedures remain the same for both the priming and no-priming conditions. That is, the main experimental task appears after two filler tasks: (1) a search for an Italian cuisine recipe book at amazon.com and (2) a search for information about MP3 players at ask.com. For each filler task, as in experiment 1, we asked participants to browse (i.e., no further clicking) the results first, then respond to a number of questions pertaining to their search results, such as whether each search result on amazon.com was accompanied by a photo.

Following a recognition test, participants in both conditions evaluated the three focal brands (Narai, Hilton, and Shangri-La) along the primed brand attribute (i.e., luxuriousness) and an unprimed attribute (i.e., friendliness). The experiment ended with questions designed to provide manipulation checks.

Dependent and Independent Measures

We collected dependent measures (similar to those used in experiment 1) about participants' recognition of the focal, unknown hotel brand and their evaluation of its luxuriousness and friendliness. Table 3 provides the summary statistics of the measures used. Appendix B lists the scale items and their reliability index.

Results

Manipulation Checks

We used two seven-point Likert scales as manipulation checks. Participants in the priming and no-priming conditions do not differ significantly in their opinions of whether the SERP that they encountered in the experiment is typical of regular search results on Google ($M_{priming} = 5.44$, $M_{no-priming} = 5.27$, t(238) = 1.08, $p > .25$). Thus, their responses to the manipulation check question clearly establish that participants in both the priming and no-priming conditions considered the study scenario realistic and typical of their normal Internet searches.

---

[11]Our pretest results suggest that even a pampered vacation in Thailand is within reasonable reach for average college students in Hong Kong. Prices for such vacation packages start as low as US$400.

Recognition

For participants assigned to the priming condition, 41 of the 60 participants in priming-condition 1 (unknown brand shown before two well-known brands) and 28 of the 60 participants in priming-condition 2 (two well-known brands shown before the unknown brand) correctly recognized the focal, unknown brand. In comparison, for participants assigned to the no-priming condition, 30 of the 60 participants in no-priming-condition 1 and 23 of the 60 participants in no-priming-condition 2 correctly recognized the focal, unknown brand. The recognition proportions in no-priming-conditions 1 and 2 are not statistically different (50.0 percent versus 38.3 percent, z = 1.29, $p > .05$).

Chi-square tests for the effect of display order on recognition of the focal unknown brand are significant in the priming condition ($\chi^2 = 5.76$, df = 1, $p = .02$) but insignificant in the no-priming condition ($\chi^2 = 1.6$, df = 1, $p = .20$). A Chochran-Matel-Haenszel test ($Q_{MH} = 6.73$, $p < .01$) further suggests a strong association between display order and recognition measure, adjusted for the priming factor. This analysis, therefore, renders support for H1b.

Luxuriousness

As hypothesized in H2b, a significant three-way interaction of display position, priming, and Internet search skills influences evaluations of the luxuriousness of the unknown hotel brand ($F(1,232) = 4.44$, $p < .05$), according to an ANOVA test (Table 4). Using a simple effect tests (Page et al. 2003), we explore the nature of this interaction and find, in particular, that the two-way interaction effect between search skills and ranking display is significant under the priming condition ($F(1,232) = 9.07$, $p < .01$) but insignificant under the no-priming condition ($F(1,232) = .01$, $p > .90$). This finding offers strong support for the interaction effect hypothesized in H2b. Figure 3 illustrates the pattern of the three-way interaction.

As in experiment 1, we conducted a follow-up, simple main effects test for the priming condition. Participants with low search skills tend to evaluate the unknown hotel brand as more luxurious when it is displayed first ($M_{first-position} = 5.43$) rather than third ($M_{third-position} = 4.79$; $F(1,232) = 6.59$, $p < .05$). However, among those participants with high search skills, we find no significant difference ($F(1,232) = 3.03$, $p = .08$) in luxuriousness evaluations, whether the unknown hotel appears first ($M_{first-position} = 4.52$) or third ($M_{third-position} = 4.93$).

Table 3. Descriptive Statistics of Variables

Construct	Mean	Standard Deviation
Luxuriousness	5.03	0.94
Friendliness	5.21	0.97
Overall brand evaluation	5.36	0.93
Internet search skill	4.47	1.09

Note: All scales are from 1 to 7.

Table 4. ANOVA Summary: Brand Perceptions of Hotel Luxuriousness

Source	df	Mean Square	F	Sig.
Between-subjects				
Display position	1	0.22	0.27	0.61
Search skill	1	0.35	0.41	0.52
Priming	1	3.28	3.91	0.05
Display position × Search skill	1	4.41	5.26	0.02
Display Position × Priming	1	0.15	0.18	0.67
Search skill × Priming	1	5.70	6.79	0.01
Display position × Search skill × Priming	1	3.72	4.44	0.04

Note: All scales are from 1 to 7.
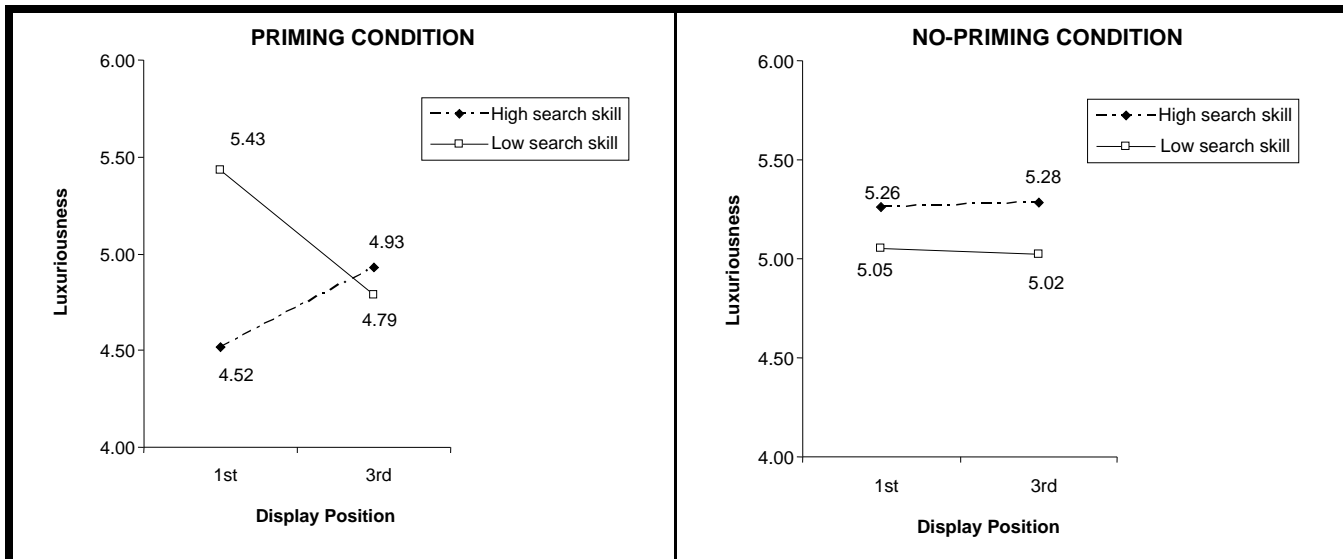
Figure 3. Comparison of the Interaction Pattern of Display Position and Internet Search Skill in the Priming Condition and No-Priming Condition (Experiment 2)

Friendliness

The 2 (priming versus no-priming) by 2 (display position of unknown brand: first versus third) by 2 (high versus low search skills) ANOVA model for the friendliness of the unknown hotel brand is not significant, according to an omnibus F-test (F(1,232) = .65, *p* > .40). This finding offers additional support for our hypothesis that the interaction effect of search engine display ranking, search skills, and priming only emerges for primed attributes, not unprimed attributes.

Discussion

Experiment 2 provides compelling evidence that display order influences brand perceptions for unknown brands in SERPs, especially when the search engine ranking schema of participants can be activated by brand attribute priming. First, in support of H2a, we find that the recognition advantage for the lesser-known brand displayed before well-known brands is more pronounced in the priming condition than in the no-priming condition. Second, we expose a significant three-way interaction effect of ranking display, search skills, and priming on participants' evaluations of the unknown brand along the primed brand attribute (but not on the unprimed attribute). In support of H2b, the two-way interaction effect of ranking display and search skills on brand evaluations along the primed attribute is strong for those with low Internet search skills but insignificant for those with high search skills. Replicating the finding from experiment 1, we also confirm that participants in the priming condition perceive the unknown hotel brand as more luxurious when it appears before two well-known hotel brands than when it appears after them.

General Discussion ▋▋▋▋▋

Our two experiments together suggest that Internet users likely possess schema about how search engines operate and the meaning of search engine rankings. When Internet users are primed to search for brands along a particular brand attribute, they are more likely to recognize an unknown brand if it is displayed before well-known brands in the SERP than when it appears after them. In addition, with this kind of brand feature priming, Internet users with relatively low (compared with high) search skills tend to evaluate the unknown brand more favorably on the primed attribute.

Theoretical Implications

Building on schema theory in the cognitive psychology domain, we explore how schema-based processing may influence Internet users' processing of inconsistent information in SERPs. A person's schema represents the long-standing and relatively stable basic assumptions that he or she holds about how the world works (Epstein et al. 1988), which implies that a schema pertains to some aspects of the world that are well-established or well-understood (e.g., family relationship schema, Dattilio 2005). By demonstrating the existence, activation, and impact of Internet users' search engine ranking schema, we extend the applicability of the schema theory to a new, fast changing research context: SERPs that have been in existence for a little over 10 years.

Our study also contributes several fresh perspectives to e-commerce research. First, although priming and schema have been studied extensively in the cognitive psychology domain, their application the in e-commerce literature is rare. By bringing these key cognitive mechanisms into the e-commerce literature, we enrich this stream of literature by applying a cognitive psychology lens centered on schema-based information processing. A specific e-commerce research area that appears particularly promising for the application of schema theory entails design principles for e-commerce web sites. As e-commerce matures, Internet users may develop different types of design schemata for different kinds of e-commerce web sites (e.g., a gaming site versus a news web site). Firms can explore which kind of cognitive mechanism (e.g., priming through a FLASH web site introduction) works best to activate certain types of design schema so they can optimize their web interface and maximize their e-commerce effectiveness. For example, an online store may use a FLASH animation to activate a "virtual store setting" design schema for store visitors, so that visitors can quickly ease into browsing the online store's offerings, akin to taking a walk in the aisles of the local supermarket.

Second, a few existing studies explore the role of information display in e-commerce shopping behaviors, but their theoretical base relies on an IS paradigm, focusing on download time and motor movements (e.g., Hogue and Lohse 1999). By combining two streams of literature regarding schema-based information processing and motor movements, e-commerce researchers could derive richer insights into the design of e-commerce web sites or advertising placement. In particular, because a schema represents beliefs that Internet users hold about certain aspects of the e-commerce site and motor movements pertain to users' actual behaviors within the site, further research should identify the optimal display of brands, information, advertising, and so forth. For example, Internet users may hold web site navigational schema about the relative positioning of content, such as the positioning of menu bars or banner advertisements in a typical web page. Accordingly, researchers could investigate how users' web site navigational schema may influence their clickstream behaviors.

Overall, this study contributes to the e-commerce literature by building an interdisciplinary theoretical framework that can be applied to decipher the branding power of using search engines for online promotions. To our knowledge, this investigation is the first empirical study grounded in cognitive psychology theories that attests to the effectiveness of search engines as tools for brand building and differentiation in cyberspace.

Managerial Implications

Echoing industry investigations in the same domain, our research offers compelling evidence about the effectiveness of top ranking results in SERPs for shaping the perceptions of lesser-known brands that manage to get to the top of SERPs. We conclude that these firms can apply a "brand positioning" strategy in search engine marketing to achieve two fundamental promotional objectives: build awareness and shape attitude (Belch and Belch 2004).

The brand attribute priming strategy used in our experiment setting is analogous to a brand positioning strategy in the marketing literature (e.g., Rossiter and Percy 1997), such as Samsung's "stylish design" positioning for its cell phones. This recommendation also finds support in industry studies that conclude that targeting longer, more specific keyword phrases, rather than a few short, broad terms in search engine marketing campaigns, can produce more qualified traffic and higher browser-to-customer conversion rates (iProspect 2006).

In particular, our hypothesis 1 demonstrates that awareness of an unknown brand that is displayed before well-known brands in SERPs will be higher, as indicated by better recognition of the unknown brand. As an example, an unknown cell phone brand X that wants to boost people's perceptions about its stylishness could work on organic search engine optimization, in the hope that it would be displayed ahead of Samsung when people search for "stylish cell phones." If the scheme works as planned, the unknown cell phone brand X may enjoy better exposure for its brand. With enhanced brand exposure, brand information will become more accessible, so the choice likelihood of the brand will be higher as well (Nedungadi 1990). Hence, a cell phone manufacturer pursuing this strategy eventually may reap the benefits of higher sales from consumers who want stylish cell phones.

According to hypothesis 2, this strategy also may induce attitude change, at least among less sophisticated Internet searchers, who will perceive that the unknown brand possesses a higher value on the primed brand attribute. The implication for the cell phone manufacturer in our example is

that it can shape Internet users' perceptions (i.e., cell phone brand X is stylish) by engaging in search engine optimization. Thus, when consumers are in the mood to buy stylish cell phones (e.g., they might be primed about the stylishness dimension by watching other cell phone users or reading news reports about cool gadgets), they may search online using more specific and targeted keyword phrases (e.g., stylish cell phones). If brand X can successfully gain a display position ahead of common stylish cell phones (e.g., Samsung, iPhone), it may establish a positive impression of its stylishness, especially among less sophisticated Internet users. Specifically, the firm could target potential customers for brand X cell phone with carefully designed marketing communications (e.g., direct e-mails).

Finally, our study offers useful guidelines for companies that intend to leverage the cross-platform synergy by integrating both online and offline promotional campaigns. Internet users' search queries can often be affected by offline promotional campaigns (*New Media Age* 2007) once they are primed by the promotional theme. Accordingly, suppose that the Bahamas Tourism Bureau is running a series of romance-themed TV ads. A newly opened hotel in the Bahamas could jump on the opportunity by optimizing its web site for search engine indexing along the luxuriousness dimension. By doing so, it may successfully elevate its luxuriousness image if it can make it to the top of search results for "luxury hotels in Bahamas."

Limitations and Suggestions for Further Research

Our results provide new perspectives on the contextual factors of search engine ranking effects for brand positioning. Although studies show that branding impact may occur even if users do not click on the search results (Lee 2004), it is definitely worthwhile to examine actual behaviors, such as clickthroughs or purchases, in a field experiment setting. Such a study may be more complicated in a technical sense and the corresponding design may minimize researcher control, but it does enable more accurate measures of the impact of brand building on purchases.

While the priming-to-schema activation link is well-established in the psychology literature, the priming mechanism is not the only cognitive mechanism that can activate individuals' schemata. Along this line, it should be beneficial to examine other possible means of schema activation and their impact on memory and judgment in the search engine marketing context. In particular, search task specificity (e.g., when users deliberately search along a particular brand attribute) could potentially trigger the schema that is relevant for

the decision context. Conceivably, this scenario would most likely occur for those motivated searchers who know clearly what they want.

In the present study, we asked our participants to use a standard search phrase in order to maximize experiment control and avoid inconsistency in displaying different web pages (e.g., luxury-primed participants could have used words such as upscale, lavish, or high-end instead of luxury in constructing their search queries). The literature (e.g., Higgins et al 1985; Wyer and Carlston 1979) has shown that priming enhances the accessibility of the primed concept (e.g., luxuriousness) and its likelihood of being used in a subsequent judgment task. Therefore, a search for luxury hotels should be a natural task for individuals who are primed about the trait of luxuriousness. Still, future research could relax our procedure by letting participants choose their own search phrases following priming.

Finally, although a brand positioning strategy is the most sensible one for SMEs, large firms may be interested in the impact of search engine rankings on their overall brand evaluations, which could provide another interesting direction for further research.

Conclusion

Integrating theories from various research domains, we find that search engine results can serve as a meaningful vehicle for creating brand positioning in the e-commerce world. This mechanism appears especially significant when Internet users' search engine ranking schema gets activated (e.g., through a brand feature priming mechanism), and it is particularly salient for less-sophisticated Internet searchers. Therefore, our research sheds more light on the importance of search engine optimization efforts by lesser-known brands. Furthermore, by examining the direct branding impact of search engine results, our research broadens the performance metrics of search engines as online advertising tools that are becoming increasingly important in response to rising concerns about click frauds.

Our study also provides sound guidelines that firms may use to optimize their display rankings. This innovative use of search engines as a free promotional tool can help firms build their brands and achieve success in the e-commerce domain.

Acknowledgments

References

Alba, J. W., and Hasher, L. 1983. "Is Memory Schematic?," *Psychological Bulletin* (93:2), pp. 203-231.

Alba, J. W., and Hutchinson, J. W. 1987. "Dimensions of Consumer Expertise," *Journal of Consumer Research*, 13, pp. 411-454.

Anderson, J. R. 1996. *The Architecture of Cognition*, Mahwah, NJ: Lawrence Erlbaum.

Arnold, V., Clark, N., Collier, P. A., Leech, S. A., and Sutton, S. G. 2006. "The Differential Use and Effect of Knowledge-Based System Explanations in Novice and Expert Judgment Decisions," *MIS Quarterly* (30:1), pp. 79-97.

Aula, A., and Nordhausen, K. 2006. "Modeling Successful Performance in Web Searching," *Journal of the American Society for Information Science and Technology* (57:12), pp. 1678-1693.

Bannan, K. J. 2007. "Detecting, Defeating Click Fraud," *B to B* (92:2), pp. 15-16.

Batra, R., and Homer, P. M. 2004. "The Situational Impact of Brand Image Beliefs," *Journal of Consumer Psychology* (14:3), pp. 318-330.

Belch, G. E., and Belch, M. A. 2004. "Advertising and Promotion: An Integrated Marketing Communications Perspective," Boston: McGraw-Hill Irwin.

Benbasat, I., and Dexter, A. 1985. "An Experimental Evaluation of Graphical and Color Enhanced Presentation," *Management Science* (31:11), pp. 1348-1364.

Berkowitz, L., and Rogers, K. H. 1986. "A Priming Effect Analysis of Media Influences" in *Perspectives on media effects,* J. Bryant and D. Zillmann (eds.), Hillsdale, NJ: Lawrence Erlbaum, pp. 57-81.

Bettman, J. R., Payne, J. W., and Staelin, R. 1986. "Cognitive Considerations in Designing Effective Labels for Presenting Risk Information," *Journal of Public Policy and Marketing* (5:1), pp. 1-28.

Brewer, W. F., and Nakamura, G. V. 1984. "The Nature and Functions of Schemas," in *Handbook of social cognition*, R. S. Wyer and T. K. Srull (eds.), Hillsdale, NJ: Lawrence Erlbaum, pp. 119-160.

Brown, A., and Dittmar, H. 2005. "Think 'Thin' and Feel Bad: The Role of Appearance Schema Activation, Attention Level, and Thin-Ideal Internalization for Young Women's Responses to Ultra-Thin Media Ideals," *Journal of Social and Clinical Psychology* (24:8), pp. 1088-1103.

Browne, G. J., Pitts, M. G., and Wetherbe, J. C. 2007. "Cognitive Stopping Rules for Terminating Information Search in Online Tasks," *MIS Quarterly* (31:1), pp. 89-104.

Buchan, N. 2006. "Search Engine Marketing Explained," *B & T Weekly*, September 22, pp. 1-3.

Buchanan, L., Simmons, C. J., and Bickart, B. A. 1999. "Brand Equity Dilution: Retailer Display and Context Brand Effects," *Journal of Marketing Research* (36:3), pp. 345-355.

Compeau, D. R., Higgins, C. A., and Huff, S. 1999. "Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study," *MIS Quarterly* (23:2), pp. 145-158.

Dattilio, F. M. 2005. "The Restructuring of Family Schemas: A Cognitive-Behavior Perspective," *Journal of Marital and Family Therapy* (31:1), pp. 15-30.

Delaney, K. J. 2006. "Leadership (a Special Report); Wisdom for the Web: Search-Engine Advertising Is Crucial These Days; but Marketers Have to Know What They're Doing," *The Wall Street Journal*, July 10, p. R4.

Domke, D., Shah, V. D., and Wackman, B. D. 1998. "Media Priming Effects: Accessibility, Association, and Activation," *International* (10:1), pp. 51-74.

Drèze, X., and Zufryden, F. 2004. "The Measurement of Online Visibility and its Impact on Internet Traffic," *Journal of Interactive Marketing* (18:1), pp. 20-37.

Economist. 2006. "Special Report: The Ultimate Marketing Machine—Internet Advertising" July 6, pp. 70-73.

EnQuiro. 2007. "The Brand Lift of Search" (available at http://pages.enquiro.com/whitepaper-the-brand-lift-of-search.html; accessed February 2010).

Epstein, N., Schlesinger, S., and Dryden, W. 1988. "Concepts and Methods of Cognitive-Behavior Family Treatment," in *Cognitive-Behavior Therapy with Families*, N. Epstein, W. Dryden, and S. E. Schlesinger (eds.), New York: Taylor and Francis, Inc., pp. 5-48.

Evans, M. P. 2007. "Analyzing Google Rankings through Search Engine Optimization Data," *Internet Research* (17:1), pp. 21-37.

Feldman, J. M., and Lynch, J. G. J. 1988. "Self-Generated Validity and Other Effects of Measurements on Belief, Attitude, Intention, and Behavior," *Journal of Applied Psychology* (73:3), pp. 421-435.

Fusco, P. J. 2005. "Building Brands with SEO," *ClickZ*, October 12 (available at http://www.clickz.com/showPage.html?page=3555156; accessed February 2010).

Fusco, P. J. 2006. "Can Big Brands Own 'It'?," *ClickZ*, October 11 (available at http://www.clickz.com/showPage.html?page=3623640; accessed February 2010).

Garramone, G. M. 1992. "A Broader and Warmer Approach to Schema Theory," in *Communication Yearbook* (Vol. 15), S. A. Deetz (ed.), Newbury Park, CA: Sage Publications, pp. 146-154.

Garside, J. 2007. "Google Phobia (Noun): A Rational Fear of a Search Engine Seeking to Dominate Internet Advertising," *The Sunday Telegraph* (London), April 12, p. 6.

Gefen D., and Straub, D. W. 2000. "The Relative Importance of Perceived Ease-of-Use in IS Adoption: A Study of E-Commerce Adoption," *Journal of the Association for Information Systems* (1:8), pp. 1-30.

Gilbert, D. T., and Hixon, J. G. 1991. "The Trouble of Thinking: Activation and Application of Stereotypic Beliefs," *Journal of Personality and Social Psychology* (60:4), pp. 509-517.

Gordon, M. E., Slade, A., and Schmitt, N. 1987. "Students Guinea Pigs: Porcine Predictors and Particularist Phenomena," *Academy of Management Review* (12:1), pp. 160-163.

Gori, M., and Witten, I. 2005. "The Bubble of Web Visibility," *Communications of the ACM* (48:3), pp. 115-117.

Hansell, S. 2005. "Google Prepares to Sell Ads Not Related to Searches," *New York Times*, April 25, p. C1.

Hargittai, E. 2002. "Beyond Logs and Surveys: In-Depth Measures of People's Online Skills," *Journal of the American Society for Information Science and Technology* (53:14), pp. 1239-1244.

Heckler, S. E., and Childers, T. L. 1992. "The Role of Expectancy and Relevancy in Memory for Verbal and Visual Information: What Is Incongruency?," *Journal of Consumer Research* (18:4), pp. 475-492.

Higgins, E. T., Barghm J. A., and Lombardi, W. 1985. "Nature of Priming Effects on Categorization," *Journal of Experimental Psychology: Learning, Memory, and Cognition* (11:1), pp. 59-69.

Higgins, E. T., and King, G. 1981. "Accessibility of Social Constructs: Information-Processing Consequences of Individual and Contextual Variability," in *Personality, Cognition, and Social Interaction*, N. Cantor and J. F. Kihlstrom (eds.), Hillsdale, NJ: Lawrence Erlbaum, pp. 69-121.

Hogarth, R. M., and Einhorn, H. J. 1992. "Order Effects in Belief Updating: The Belief–Adjustment Model," *Cognitive Psychology* (24:1), pp. 1-55.

Hogue, A. Y., and Lohse, G. L. 1999. "An Information Search Cost Perspective for Designing Interfaces," *Journal of Marketing Research* (36:3), pp. 387-395

Hong, W., Thong, J. Y. L., and Tam, K-Y. 2004. "The Effects of Information Format and Shopping Task on Consumers' Online Shopping Behavior: A Cognitive Fit Perspective," *Journal of Management Information Systems* (21:3), pp. 149-184.

Internet Advertising Bureau. 2004. "IAB Search 2004: The New Branding Story," (available at http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/4742; accessed Feburary 2010).

Introna, L. D., and Nissenbaum, H. 2000. "Shaping the Web: Why the Politics of Search Engines Matters," *The Information Society* (16), pp. 169-80.

iProspect. 2006. *iProspect Search Engine User Behavior Study*, Watertown, MA: iProspect.

Jansen, B. J., and Molina, R. P. 2006. "The Effectiveness of Web Search Engines for Retrieving Relevant e-Commerce Links," *Information Processing and Management* (42:4), pp. 1075-1098.

Jansen, B. J., and Resnick, M. 2006. "An Examination of Searcher's Perceptions of Nonsponsored and Sponsored Links During e-Commerce Web Searching," *Journal of the American Society for Information Science and Technology* (57:14), pp. 1949-1961.

Jarvenpaa, S. L., and Dickson, G. W. 1988. "Graphics and Managerial Decision Making: Research Based Guidelines," *Communications of the ACM* (31:6), pp. 764-774.

Jiang, Z., and Benbasat, I. 2007. "The Effects of Presentation Formats and Task Complexity on Online Consumers' Brand Understanding," *MIS Quarterly* (31:3), pp. 475-500.

Jones, K. C. 2006. "Search Sophistication to Drive Online Sales, Marketing," *TechWeb*, October 2, p. 1.

Khatri, V., Vessey, I., Ramesh, V., and Park, S-J. 2006. "Understanding Conceptual Schemas: Exploring the Role of Application and IS Domain Knowledge," *Information Systems Research* (17:1), pp. 81-99.

www.manaraa.com

Kitts, B., and LeBlanc, B. 2004. "Optimal Bidding on Keyword Auctions," *Electronic Markets* (14:3), pp. 186-201.

Kleinmuntz, D. N., and Schkade, D. A. 1993. "Information Displays and Decision Processes," *Psychological Science* (4:4), pp. 221-227.

Kumar, A, and Krishnan, S. 2004. "Memory Interference in Advertising: A Replication and Extension," *Journal of Consumer Research* (30:4), pp. 602-611

Kumar, N., and Benbasat, I. 2004. "The Effect of Relationship Encoding, Task Type, and Complexity on Information Representation: An Empirical Evaluation of 2D and 3D Line Graphs," *MIS Quarterly* (28:2), pp. 255-281.

Laffey, D. 2007. "Paid Search: The Innovation that Changed the Web," *Business Horizons* (50:3), pp. 211-218.

Lalisan, A. E. 2007. "E-Commerce Not that Simple," *Business World* (Manila), March 27, p. 1.

Lane, V. R. 2000. "The Impact of Ad Repetition and Ad Content on Consumer Perceptions of Incongruent Extensions," *Journal of Marketing* (64:2), pp. 80-91.

Lee, K. 2004. "Yes, Virginia, There Is SEM Brand Lift, Part 1," (available at http://www.clickz.com/showPage.html?page= 3381241; accessed February 2010).

Lee, K. 2006. "Paying for Shelf Space in the Search Supermarket," (available at http://www.clickz.com/showPage.html?page= 3623308; accessed February 2010).

Mandel, N., and Johnson, E. J. 2002. "When Web Pages Influence Choice: Effects of Visual Primes on Experts and Novices," *Journal of Consumer Research* (29:2), pp. 235-245.

Mandler, G. 1982. "The Structure of Value: Accounting for Taste," in *Affect and Cognition: The Seventeenth Annual Carnegie Symposium on Cognition*, M. Sydnor Clark (ed.), Hillsdale, NJ: Lawrence Erlbaum, pp. 3-36.

Marakas, G. M., Yi, M. Y., and Johnson, R. D. 1998. "The Multilevel and Multifaceted Character of Computer Self-Efficacy: Toward Clarification of the Construct and an Integrative Framework for Research," *Information Systems Research* (9:2), pp. 126-163.

McClelland, J. L., and Rumelhart, D. E. 1985. "Distributed Memory and the Representation of General and Specific Information," *Journal of Experimental Psychology: General* (114), pp. 159-188.

McCoy, S., Everard, A., Polak, P., and Galletta, D. F. 2007. "The Effects of Online Advertising," *Communications of the ACM* (50:3), pp. 84-88.

Meyers-Levy, J., and Tybout, A. M. 1989. "Schema Congruity as a Basis for Brand Evaluation," *Journal of Consumer Research* (16:1), pp. 39-54.

Media. 2007. "What Makes You Presume 'Sex' Is the Most Popular Word?" (March 23), p. 14.

Mitchell, A. A., and Daci, P. A. 1996. "The Assessment of Alternative Measures of Consumer Expertise," *Journal of Consumer Research* (23:2), pp. 219-239.

Nedungadi, P. 1990. "Recall and Consumer Consideration Sets: Influencing Choice Without Altering Brand Evaluations," *Journal of Consumer Research* (17:3), pp. 263-276.

New Media Age. 2007. "Search Marketing: Opinion Formers," March 29, p. S8.

Nielsen//NetRatings. 2006. "Online Search Hits All-Time High of 5.7 Billion Searches," press release, March 3 (available at http://www.nielsen-online.com//pr/pr_060302.pdf; accessed February 2010).

Noaman, A. 2006. "Pick Me! Pick Me!" *ABA Bank Marketing* (38:7), pp. 34-38.

Novak, T. P., Hoffman, D. L., and Yung, Y-F. 2000. "Measuring the Customer Experience in Online Environments: A Structural Modeling Approach," *Marketing Science* (19:1), pp. 22-42.

O'Connell, S. 2007. "The Beauty of Internet Marketing," *Sunday Times* (London), March 25, p. 10.

Page, M. C., Braver, S. L., and MacKinnon, D. P. 2003. *Levine's Guide to SPSS for Analysis of Variance* (2nd ed.), Mahwah, NJ: Lawrence Erlbaum Associates.

Pavlou, P. A., and Fygenson, M. 2006. "Understanding and Predicting Electronic Commerce Adoption: An Extension of the Theory of Planned Behavior," *MIS Quarterly* (30:1), pp. 115-143.

Peracchio, L. A., and Tybout, A. M. 1996. "The Moderating Role of Prior Knowledge in Schema-Based Brand Evaluation," *Journal of Consumer Research* (23:3), pp. 177-191.

Pham, M. T., and Johar, V. 1997. "Contingent Processes of Source Identification," *Journal of Consumer Research* (24), pp. 249-265.

Rossiter, J. R., and Percy, L. 1997. *Advertising Communications and Promotions Management*, Boston: Irwin/McGraw-Hill.

Rowley, J. 2004. "Online Branding," *Online Information Review* (28:2), pp. 131-138.

Russo, J. E., and Rosen, L. D. 1975. "An Eye Fixation Analysis of Multialternative Choice," *Memory and Cognition* (3:3), pp. 267-276.

Saban, K. A., and Rau, S. E. 2005. "The Functionality of Websites as Export marketing Channels for Small and Medium Enterprises," *Electronic Markets* (15:2), pp. 128-135.

Shapiro, M. A. 1994. "Think-Aloud and Thought-Listing Procedures in Investigating Mental Processes," in *Measuring Psychological Responses to Media Messages*, A. Lang (ed.), Hillsdale, NJ: Lawrence Erlbaum, pp. 1-14.

Sherif, M, and Hovland, C. I. 1961. *Social Judgment: Assimilation and Contrast Effects in Communication and Attitude Change*, New Haven, CT: Yale University Press.

Simonin, B. L., and Ruth, J. A. 1998. "Is a Company Known by the Company It Keeps? Assessing the Spillover Effects of Brand Alliances on Consumer Brand Attitudes," *Journal of Marketing Research* (35:1), pp. 30-42.

Slater, M. 2004. "Operationalizing and Analyzing Exposure: The Foundation of Media Effects Research," *Journalism and Mass Communication Quarterly* (81:1), pp. 168-184.

Smith-Janik, S. B., and Teachman, B. A. 2008. "Impact of Priming on Explicit Memory in Spider Fear," *Cognitive Therapy and Research* (32:2), pp. 291-303.

Srull, T. K., and Wyer, R. S. Jr. 1989. "Person Memory and Judgment," *Psychological Review* (96:1), pp. 58-83.

Strack, F. 1992. "The Different Routes to Social Judgments: Experiential Versus Informational Strategies," in *The Con-*

struction of Social Judgments, L. L. Martin and A. Tesser (eds.), Hillsdale, NJ: Lawrence Erlbaum, pp. 249-276.

Sujan, M., Bettman, J. R., and Sujan, H. 1986. "Effects of Consumer Expectations on Information Processing in Selling Encounters," *Journal of Marketing Research* (23:11), pp. 346-353

Tan, J. K. H., and Benbasat, I. 1990. "Processing of Graphical Information: A Decomposition Taxonomy to Match Data Extraction Tasks and Graphic Presentations," *Information Systems Research* (1:4), pp. 416-439.

Taylor, S. E., and Crocker, J. 1981. "Schematic Bases of Social Information Processing," in *Social Cognition: The Ontario Symposium*, E. T. Higgins, C. P. Herman, and M. P. Zanna (eds.), Hillsdale, NJ: Lawrence Erlbaum, pp. 89-134.

Telang, R., Rajan, U., and Mukhopadhyay, T. 2004. "The Market Structure for Internet Search Engines," *Journal of Management Information Systems* (21:2), pp. 137-160.

Tesser, A. 1978. "Self-Generated Attitude Change," in *Advances in Experimental Social Psychology*, L. Berkowitz (ed.), New York: Academic Press, pp. 289-338.

Thurow, S. 2006a. "Analyzing Search Behavior for SEO," (available at http://www.clickz.com/showPage.html?page=3607336; accessed February 2010).

Thurow, S. 2006b. "Debunking SEO Myths," (available at http://www.clickz.com/showPage.html?page=3587096; accessed February 2010).

Torkzadeh, G., Chang, J. C., and Demirhan, D. 2006. "A Contingency Model of Computer and Internet Self-Efficacy," *Information & Management* (43:4), pp. 541-550.

Tourangeau, R., and Rasinski, K. 1988. "Cognitive Processes Underlying Context Effects in Attitude Measurement," *Psychological Bulletin* (103), pp. 299-314.

Wasserman, T. 2006. "Google Advocates Change in Advertising Approach," *Brandweek* (47:36), p. 12.

Wegener, D. T., and Petty, R. E. 1997. "The Flexible Correction Model: The Role of Naive Theories of Bias in Bias Correction," in *Advances in Experimental Social Psychology*, M. Zanna (ed.), San Diego: Academic Press, pp. 141-208.

Wilson, T. D., and Hodges, S. D. 1992. "Attitudes as Temporary Constructions," in *The Construction of Social Judgment*, L. L. Martin and A. Tesser (eds.), Hillsdale, NJ: Lawrence Erlbaum, pp. 37-56.

Wu, J., Cook, Jr., V. J., and Strong, E. C. 2005. "A Two-Stage Model of the Promotional Performance of Pure Online Firms," *Information Systems Research* (16:4), pp. 334-351.

Wyer, Jr., R. S., and Carlson, D. E. 1979. *Social Cognition, Inference, and Attribution*, Hillsdale, NJ: Lawrence Erlbaum.

Wyer, Jr., R. S., and Srull, T. K. 1981. "Category Accessibility: Some Theoretical and Empirical Issues Concerning the Processing of Social Stimulus Information" in *Social Cognition: The Ontario Symposium,* E. T. Higgins, C. P. Herman, and M. P. Zanna (eds.), Hillsdale, NJ: Lawrence Erlbaum, pp. 161-197.

Yi, Y. 1990. "Cognitive and Affective Priming Effects of the Context for Print Advertisements," *Journal of Advertising* (19:2), pp. 40-48.

Zaller, J. 1992. *The Nature and Origins of Mass Opinion*, New York: Cambridge University Press.

Zaller, J., and Feldman, S. 1992. "A Simple Theory of the Survey Response: Answering Questions Versus Revealing Preferences," *American Journal of Political Science* (36:3), pp. 579-616.

Zhang, P. 1998. "An Image Construction Method for Visualizing Managerial Data," *Decision Support Systems* (23:4), pp. 371-387.

About the Authors

Wenyu Dou (Ph.D., University of Wisconsin-Milwaukee) is an associate professor in the Marketing Department of City University of Hong Kong, where he is also the director for the Unit of Interactive Marketing Communications. The majority of his published articles have investigated substantive issues in e-commerce, from interactivity and online branding to the effectiveness of banner ads. His publications have appeared in journals such as *Journal of Advertising, Journal of Advertising Research, Journal of International Business Studies*, and *Journal of Business Research*, among others. He serves on the editorial board of *Journal of Interactive Advertising*.

Kai H. Lim (Ph.D., University of British Columbia) is a professor of Information Systems at City University of Hong Kong. His research interests include e-commerce-related issues with publications in some of the most prestige IS journals, including *Information Systems Research, Journal of Management Information Systems*, and *MIS Quarterly*. He is serving or has served on the editorial board of *MIS Quarterly, Information Systems Research,* and *Journal of the Association for Information Systems.*

Chenting Su (Ph.D., Virginia Tech) is an associate professor in the Department of Marketing, City University of Hong Kong, and an adjunct professor at Wuhan University, China. His research has been published in *Journal of Marketing Research, Journal of the Academy of Marketing Science, Journal of International Business Studies*, *International Journal of Research in Marketing, Psychology and Marketing, Strategic Management Journal*, and others.

Nan Zhou (Ph.D., University of Utah) is a professor in the Department of Marketing, City University of Hong Kong, and Changjiang Scholar Chair Professor, Department of Marketing, Wuhan University, China. As a leading researcher in advertising and marketing in China, he has published in *Information and Management, Journal of Advertising, Journal of Advertising Research, Journal of Business Research, Journal of Consumer Research, Journal of International Business Studies, Strategic Management Journal*, and others.

Nan Cui (Ph.D., Wuhan University) is an assistant professor in the Department of Marketing, Wuhan University. His research interests are related to e-commerce topics. He has published in *Journal of Marketing Science*. He served as the corresponding author on this paper.

MIS Quarterly

BRAND POSITIONING STRATEGY USING SEARCH ENGINE MARKETING

By: **Wenyu Dou**
Department of Marketing
City University of Hong Kong
Tat Chee Avenue
Kowloon
HONG KONG SAR
mkwydou@cityu.edu.hk

Kai H. Lim
Department of Information Systems
City University of Hong Kong
Tat Chee Avenue
Kowloon
HONG KONG SAR
iskl@cityu.edu.hk

Chenting Su
Department of Marketing
City University of Hong Kong
Tat Chee Avenue
Kowloon
HONG KONG SAR
mkctsu@cityu.edu.hk

Nan Zhou
Department of Marketing
City University of Hong Kong
Tat Chee Avenue
Kowloon
HONG KONG SAR
mkzhou@cityu.edu.hk

Nan Cui
Department of Marketing
Wuhan University
Wuhan
CHINA
nancui@whu.edu.cn

Appendix A

Experimental Search Engine ▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬

Appendix B

Scales Used in the Study

Heavy-Dutiness (α = .88)

"What are your opinions about the statement that 'X backpacks stand up well to heavy use in outdoor travel'?"
(strongly disagree/strongly agree, extremely unlikely/extremely likely, not at all probable/very probable)

Stylishness (α = .92)

"What are your opinions about the statement that 'X backpacks are stylish'?"
(strongly disagree/strongly agree, extremely unlikely/extremely likely, not at all probable/very probable)

Luxuriousness (α = .84)

"What are your opinions about the statement that 'hotel X in Chiang Mai, Thailand is a luxurious hotel property'?"
(strongly disagree/strongly agree, extremely unlikely/extremely likely, not at all probable/very probable)

Friendliness (α = .89)

"What are your opinions about the statement that 'hotel X in Chiang Mai, Thailand is a friendly hotel'?"
(strongly disagree/strongly agree, extremely unlikely/extremely likely, not at all probable/very probable)

Internet Search Skills (α = .86 in Experiment 1; α = .91 in Experiment 2)
(adapted from Novak et al. 2000)

Seven- point Likert scale (agree/disagree)

- "I am extremely skilled at using Internet search engines."
- "I consider myself knowledgeable about good search engine use techniques."
- "I know somewhat more than most users about using Internet search engines."
- "I know how to find what I am looking for using Internet search engines."
- "Compared to other things that I do on the web (e.g., email, chat, etc.), I'm very skillful at using Internet search engines."
- "Compared to others skills that I have (e.g., sports, cooking, singing), I'm very skillful at using Internet search engines."

Appendix C

Fictitious *BusinessWeek* Article ▮

BusinessWeek

"Fooling Google and cheating for a high ranking position"

Christopher Palmeri Edited by Deborah Stead. *BusinessWeek*. New York: Sep 12, 2005, Iss. 3950; pg. 75

Google is good. Type in what you're looking for and you have an excellent chance of finding it on the first try. That's why more people use Google to scour the web than any other search engine. ***But what if you could no longer rely on Google to return the best search results?*** After all, when you're number one, everybody wants a piece of you. For instance, online mom-and-pop shops want to appear high in Google's listings, because Google has become the most popular way for shoppers to find brands on the web.

Although most of Google's 100 million daily users consider it a trusted source of unbiased information, ***the result of a search query is often manipulated for commercial benefit by web experts***. To achieve a higher ranking, websites have to prove their popularity and usefulness through plentiful links. No wonder, then, that ***Google optimizers have sprung up to help sites achieve an artificial boost in Google's search results.***

Efforts to outfox the search engines have been around since search engines first became popular in the early 1990s. Early tricks included stuffing thousands of widely used search terms in hidden coding, called "metatags." The coding fools a search engine into identifying a site with popular words and phrases that may not actually appear on the site. Another gimmick was hiding words or terms against a same-color background. The hidden coding deceived search engines that relied heavily on the number of times a word or phrase appeared in ranking a site.

In addition, the optimizers found they could boost their clients' sites by creating websites that were nothing more than collections of links to the clients' site, called "link farms." Since Google ranks a site largely by how many links, or "votes," it gets, the link farms could boost a site's popularity.

In a similar technique, called a link exchange, a group of unrelated sites would agree to link to one another, thereby fooling Google into thinking the sites have a multitude of votes. Many sites also found they could buy links to themselves to boost their rankings.

Despite ranking on Google is determined by a number of factors, such as key words, popularity, spam, metadata, etc. all of which can be faked*. **Until now, there is no standard practice to prevent companies from manipulating search results**. And as long as Google remains a top search engine, opportunists will try to rig the system.