Are Sponsored Links Effective? Investigating the Impact of Trust in Search Engine Advertising

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As information on the Internet grows exponentially, online users primarily rely on search engines (SEs) to locate e-commerce sites for online shopping. To generate revenue while providing free service to users, SE companies offer sponsored link (SL) placements to e-commerce sites that want to appear in the first SE results page. However, the lack of users' trust in SE advertising indicates that SEs should utilize strategies to project trustworthiness on this mechanism. Despite these insights, the role of users' trust in the operation of SE advertising is still an unexplored territory. To address this issue, a theoretical model was synthesized from the social psychology literature, the marketing literature, and the trust literature to investigate the factors that may pose impacts on the effectiveness of SE advertising by influencing users' perception of both cognitive and emotional trust. A laboratory experiment was conducted. The findings document the importance of incorporating emotional components of trust in the study of online communication by showing that emotional dimension of trust is different from and complementary to cognitive trust in facilitating online communication. The findings also provide valuable implications for practitioners to design and provide more effective SLs that can benefit all parties involved.

CCS Concepts: • **Information systems → Sponsored search advertising**; **Online shopping**; • **Human-centered computing → Empirical studies in HCI**

Additional Key Words and Phrases: Online advertising effectiveness, trust in online advertising, cognitive trust, emotional trust

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1. INTRODUCTION

With the widespread usage of the World Wide Web, e-commerce has become an important business channel for enterprises all around the world. To locate e-commerce sites, search engines (SEs) are the most frequently used Web portals. 89% of consumers use search engines for purchase decisions [Griwert 2012], and 71% of business purchase decisions start on search engines [Meloni 2011]. The popularity of SEs attracts the attention of e-commerce companies. It is crucial to promote SE visibility for e-commerce companies to survive in an extremely competitive business environment. On the other

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hand, SEs need to earn revenue from content that users expect to receive for free. Fortunately, the emergence of SE advertising meets the needs of both SEs and e-commerce sites. SE advertising is a mechanism where the SE provides placement on the results page for specific search terms to merchants who agree to pay a certain fee for this service. Advertisers bid on terms that they presume their target customers would type in the search box. When a user types a query that matches the advertiser's keywords, the advertiser's link may appear to the right-hand side and/or above the organic links (OLs), which are the organic results that are considered to be highly relevant based on the search engine's ranking algorithm. These links appear under the heading "Sponsored links" (SLs) or "Ad(s)". Advertisers pay fees only when their links are clicked.

By providing relevant information to searchers in a less intrusive way, SL mechanism offers a greater probability of attracting interested buyers, and thus drives higher qualified traffic to the advertisers' websites. Studies have been widely conducted on SE advertising from various aspects in different fields. A main stream of research focuses on the development of better allocation mechanisms from the perspective of SEs [e.g., Feng et al. 2007; Weber and Zheng 2007]. Another mainstream of research concerning the development of the optimal bidding and keyword selection strategies from the perspective of advertisers also draws much attention from researchers [Amaldoss et al. 2015; Edelman et al. 2007]. Other studies with regard to SE advertising mainly focus on assessing its status quo, such as the content relevance of SLs in response to different categories of search queries [Animesh et al. 2010; Jansen and Molina 2006], the issues of click fraud with SLs [Jansen and Mullen 2008], the adverse selection of advertisers [Animesh et al. 2010], and the effects of keyword-level characteristics on customers' clicking behavior and conversion rates [Ghose and Yang 2009].

Although SE advertising benefits both SEs and advertisers, it is doubtful whether this mechanism can benefit SE users as well and whether it is an effective approach for e-commerce companies to promote themselves on the Internet. A survey published by Nielsen.com [Nielsen 2015], which was designed to assess the extent to which people trust a certain form of advertising, shows that people consider ads from SEs, website banners, and mobile phones less credible than ads from traditional media. Empirical studies also reveal users' bias against SLs. A plausible explanation is that "people do not trust messages coming from sources with a vested interest in people's acceptance of these messages" [Clemons 2009, p. 22]. This bias against SLs also has been verified by other studies [Greenspan 2004; Jansen et al. 2007a; Ma et al. 2012; 2013].

The low level of trust in SE advertising revealed by both academic and practical studies suggest that SE companies should look at strategies to project trustworthiness on the SE advertising since it is the main source of their revenue. SE companies may face the risk of losing users who are suspicious of the quality and fairness of SLs, because processing or clicking on less relevant links may render them vulnerable to less relevant information and results in a waste of time. Users need to believe that the SL mechanism provided by the SE does have the competence and integrity to provide useful, unbiased information in these links before they really take actions to process the embedded information and in turn click on these links. The ability to convince users that the information displayed in SLs is trustworthy is one of the key components to the success of SE advertising. Thus, in the current study, we focus on the trust towards the advertising mechanism. It is different from the trust towards the advertisers or the trust towards the SEs. The trust is referring to users' attitude towards relying on SE advertising when they are making searching decisions.

Despite the prevalent usage of SE advertising, very little empirical work has been done on investigating the role of users' trust in the operation of this advertising mechanism, except for some preliminary studies on users' perception of SLs. An empirical

study conducted by Becker-Olsen [2003] indicated that SLs can be an effective advertising tool to engender positive response toward an advertiser and increase feelings of customer responsiveness, product quality, category leadership, and even purchase intention. In addition, there is evidence that these types of messages are processed differently compared to other types of online advertisements. Jansen et al. [2007a] conducted a study with 56 participants to investigate the bias toward SLs. They controlled the quality of content by switching OLs and SLs on half of the tasks, and found that there was a statistically significant preference for OLs with searchers viewing these results first in more than 82 percent of the time. Although considerable research on trust in both offline and online environments has been conducted [Aljukhadar et al. 2010; Mayer et al. 1995; McKnight and Chervany 2005], studies of trust in online advertising remain scarce. Research in this area is still in an exploratory stage. Chaudhuri and Holdbrook [2001], Grabner-Kraeuter [2002], and Szczepanski [2005] reported a positive correlation between brand familiarity and reputation of the ad and consumers' trust in an online ad. Ma et al. [2013] found that the disclosure of information about vendors' reliability ratings increases consumers' perceptions of trust in the sponsored results and significantly influences consumers' perceptions of trust in sponsored results. Bruner II and Kumar [2000] found that a person's attitude toward the website influences the effectiveness of the embedded ads. Users' previous Internet experience was also found to be a determinant of their trust in an ad [Dahlen 2001; Ducoffe 1996; Gefen 2000].

The variables tested in most of the existing studies are derived from trust research on traditional ads. And almost all of the studies focus on banner ads only when investigating online ads. There is little knowledge about the impacts of trust in sponsored search advertising. Given the prevalence of sponsored search advertising, new research is needed to examine the influence of various factors on users' trust in sponsored search advertising.

To address this issue, the purpose of this research is to investigate the antecedents of users' trust on SE advertising, the underlying mechanism of how users' trust are formed and the impacts of users' trust on the effectiveness of SE advertising. This research is among the first to bring theories from social psychology and marketing literature to build an integrated theoretical model investigating the role of trust in SE advertising. In particular, the dual process model is adapted from social psychology literature to help us better understand the effects of various factors, such as information sources, personality, and context effects of persuasion, on SL's persuasive communications, the process of which SLs influence an individual's trust towards them. The marketing literature, from the other side, helps us identify the antecedents of users' trust and evaluate the effectiveness of SLs. A laboratory experiment was conducted to test the validity of this model.

2. THEORETICAL FOUNDATIONS

2.1. User's Trust on Search Engine Advertising

Trust is an extensively researched and often ambiguously defined concept that is widely considered to be a necessary factor for facilitating interactions and transactions in uncertain and risky situations, such as online environment [Gefen et al. 2003; Komiak and Benbasat 2006]. A large and growing number of studies have investigated the role of trust in the Internet environment from different perspectives [Benbasat et al. 2008]. Gefen et al. [2003] reviewed 43 related articles in trust literature and provided a summary of prior conceptualizations of trust along with the measures used to operationalize the constructs. They found that trust can be viewed as (1) a set of specific beliefs considering the competence, integrity, and benevolence of another party [Doney

and Cannon 1997; Ganesan 1994], (2) a general willingness to depend on another party, which is also called *trusting intentions* [Gefen 2000; Moorman et al. 1993], (3) affect reflected in "'feelings' of confidence and security in the caring response" of the other party [Rempel et al. 1985, p. 96], or (4) a combination of these elements [Gefen et al. 2003].

2.1.1. Cognitive Trust. In previous studies, most IS researchers define trust as trusting beliefs [Gefen et al. 2003; Komiak and Benbasat 2004; McKnight et al. 2002], which refer to the truster's cognitive beliefs resulting from the truster's attributional processes. Based on the observation of trustee's actions, truster ascribes the causes to the trustee's internal trust-related characteristics such as competence and integrity. The concept of trusting beliefs is consistent with the concept of cognitive trust, defined as a truster's rational expectations that a trustee will have the necessary attributes to be relied upon [Komiak and Benbasat 2004]. When the truster believes that good reasons to trust have been identified, cognitive trust is developed [Lewis and Weigert 1985]. The reason for focusing on cognitive trust in the majority of studies is that these studies follow the theories built for investigating traditional IT adoption. In the context of traditional IT adoption studies, most users are organizational employees using traditional IT (e.g., spreadsheets) for work-related purpose [Kim et al. 2004], contexts in which cognitive factors may dominate adoption decisions.

2.1.2. Emotional Trust. In the context of SEs, however, users are individuals who voluntarily visit SEs, seeking relevant information they desire. In this situation, users' decision about whether to trust the information could not be a purely cognitive decision. This is because at the individual level, users' emotional reaction has an impact on their decision making procedure [Derbaix 1995; Komiak and Benbasat 2006]. Particularly, when a user is looking for e-commerce information, he or she is distant from sellers, and thus unable to directly communicate with the sellers or experience the products. This uncertainty about the sellers and products will definitely make the users' choices less cognitively dominated [Hu et al. 2004; Jiang and Benbasat 2004; Komiak and Benbasat 2006]. Trust decision usually involves both reasoning and feeling. The extent to which one feels secure and comfortable about relying on the trustee, defined as emotional trust, plays an important role when making trust decisions [Komiak and Benbasat 2004]. It involves a person's feeling and faith [Rempel et al. 1985], as well as his or her evaluation of emotional reactions to the trustee [Komiak and Benbasat 2006]. Emotional trust can be irrational, enabling individuals to go beyond the available evidence to feel secure and comfortable about relying on the trustee [Holmes 1991; Komiak and Benbasat 2004; Lewis and Weigert 1985].

There is little existing work that empirically explores the effect of trust from both cognitive and emotional dimensions. Exceptions are that of Komiak and Benbasat [2004, 2006] and Johnson and Grayson [2005]. Komiak and Benbasat [2006] took a trust-centered, cognitive and emotional balanced perspective to study the adoption of recommendation agent. Findings of their study reveal that emotional trust plays an important role beyond cognitive trust in determining customers' intention to adopt recommendation agent. Johnson and Grayson [2005] used survey data from 349 customers of a firm of financial advisers in the United Kingdom and showed that cognitive and emotional dimensions of trust can be empirically distinguished and have both common and unique antecedents.

2.2. Trust Formation and the Dual Process Model

2.2.1. Dual Process Model. On account of the above-mentioned significance of trust in facilitating online interactions, it is of great importance to improve users' trust on SE advertising. The ability to persuade users that the information displayed in SLs is

trustworthy is one of the key components to the success of SE advertising, and the outcomes of the persuasion determine the effectiveness of SE advertising. Literature in social psychology mainly uses the dual process model to guide the persuasion work.

The dual process model is adopted to explain how trust-based factors may influence users' elaboration of sponsored links because this model implies that elements of a message can influence persuasion via two routes – the central route and the peripheral route. It makes it possible to examine the mediation effect of different dimensions of trust. The dual process model presents two routes to persuasion, with the central route emphasizing a consideration of issue-relevant argumentation, and the peripheral route emphasizing simple cues that are less relevant to the issue [Petty and Cacioppo 1986]. Attitude change is often determined by both central and peripheral processes. The choice of which route to use depends on an individual's motivation and ability to perform cognition-based processing. The dual process model suggests that an individual has an elaboration continuum to process information. The cognitive processing and emotional processing are considered as the two end points of this continuum [Chaiken and Trope 1999]. Under condition of moderate level of motivation and ability, a mixture of cognitive processing and emotional processing will occur.

Central Route: Formation of Cognitive Trust. Dual process model reflects two ways in which users' trust attitude on SE advertising can be formed. When users possess high motivation and ability to process relevant information, the central route is activated. Users form their trust attitude through deliberate cognitive assessment [Liu and Shrum 2009; Tam and Ho 2005]. The central route to trust is consistent with the formation of cognitive trust as central route emphasizes a consideration of issue-relevant argumentation. It requires more cognitive efforts and cognitive resources. The rational procedure of evaluating whether a trustee has the necessary attributes to be relied upon lays the foundation of cognitive trust. According to the traditional view, trust is formed by rationally evaluating whether a trustee has the necessary attributes to be relied upon [Komiak and Benbasat 2004]. It is based on the cognitive assessment of the trustee's internal trust-related characteristics such as competence, integrity, and benevolence [Mayer et al. 1995; McKnight and Chervany 2005; Robert Jr. et al. 2009]. When the truster believes that good reasons to trust have been identified, cognitive trust is developed. For example, when searching for information in SEs, experienced users who have plenty of time looking for good deals (i.e., individuals who have high motivation and ability to process SLs) tend to process the information of SLs via central route. They are more likely to look at the issue-relevant attributes, such as whether the returned SLs are relevant to their search queries, whether the SLs provide useful information (e.g., price of the product, the vendors' rating, the shipping information etc.), whether the SLs are presented in a professional way (e.g., clearly labeled SLs with the appropriate number at the right position). By providing SLs with useful relevant information in a professional way, SEs will be perceived to possess the competence and integrity to be trusted, thus increasing the users' cognitive trust via central route.

Peripheral Route: Formation of Emotional Trust. The peripheral route to trust is followed when users lack either the motivation or the ability to cognitively deliberate on issue-relevant information. For instance, people tend to avoid expending cognitive effort while attempting to achieve a satisfactory result [Chaiken et al. 1989; Petty and Cacioppo 1986], which in turn reduces their motivation to assess relevant information and thus reduces the likelihood of using the central route. With this tendency, they are likely to follow the peripheral route and rely on simple cues rather than carefully consider the merits of issue-relevant information. Moreover, when seeking e-commerce information in SE, users are distant from the website owners, and thus unable to directly communicate with the sellers or experience the products. In this situation, due to

the uncertainty about the sellers and products, users do not have the ability to engage in a full assessment of the issue-relevant information. When lacking the motivation and ability to cognitively assess the issue-relevant attributes, individuals tend to form trusting attitudes via peripheral route. The peripheral route to trust can be emotional. It involves a person's feeling and faith and evaluation of emotional reactions to the trustee [Komiak and Benbasat 2006]. The trust attitude formed via peripheral route does not involve the assessment of a particular aspect of a trustee, and is consistent with the definition of emotional trust, which refers to the extent to which an individual feels secure and comfortable about relying on the trustee [Komiak and Benbasat 2004]. For example, users who are lack of searching experience or are under the condition of time constraint tend to rely on some simple cues, such as their impression on the SEs, to form their trust perception. They click on the SLs simply because they believe the SE which provides the SLs is trustworthy. Although some previous studies of trust only focus on its cognitive perspective, it is often suggested that trust decisions usually involve both reasoning (i.e., cognition-based processing) and feeling (i.e., emotion-based processing). Komiak and Benbasat [2004] conceptualized trust as a combination of cognitive trust and emotional trust, based on the assumption that trust decisions usually involve both reasoning and feeling. The existence of emotional trust has been proposed in sociology [Holmes 1991], psychology [Jones 1996], marketing [Swan et al. 1999], and IS studies [Beaudry and Pinsonneault 2010; Deng and Poole 2010; Mehrabian and Russell 1974; Porat et al. 2007]. The trust attitude of an individual includes two separate aspects – the cognitive trust (i.e., rational reasoning of trustee's internal trust-related characteristics) and the emotional trust (i.e., emotional feeling that involves little rational cognitive assessment) [Komiak and Benbasat 2004]. The dual process model will be used to explain how trust-based factors of SE advertising could affect users' formation of trust attitude and how users' trust attitude could influence their responses to SE advertising.

2.2.2. Measures of the Effectiveness of Search Engine Advertising. When users are exposed to ads in SEs, an interaction between ads and users happens throughout the entire process. The effectiveness of SE advertising is measured by the users' responses to the ads.

Behavioral Responses. In previous work on the effectiveness of online advertising, it has been argued that the effectiveness of online ads should be evaluated by their ability to generate click-through or some other behavioral responses, such as sales or interactions on a website [Hoffman and Novak 2000]. A widely used measure is click-through rate, which is obtained by dividing the "number of clicks on an ad" on a Web page by the "number of times the ad was delivered" (impressions) [Hanson and Kalyanam 2007]. Previous research has used the number of clicks to analyze users' online search behavior [Wang et al. 2012]. The attraction of the click-through variable lies in its behavioral nature, its measurability, and the fact that it indicates immediate interest [Briggs and Hollis 1997].

Attitudinal Responses. Others have argued that direct response is a complex phenomenon which is partly determined by factors relating to the predisposition of the audience, not the advertising itself [Baltas 2003; Bruner II and Kumar 2000]. A single measure cannot provide an integrated picture of online advertising. The appropriateness of a method for the evaluation of an online advertising depends on the objectives of the advertiser. If the objective is to attract online users to visit its website or some other behavioral responses (e.g., click-through, sales, interaction on a website), then the ability of ads to generate the desired behavioral responses should be measured. If the objective is to build brand awareness or brand attitude, then the attitudinal

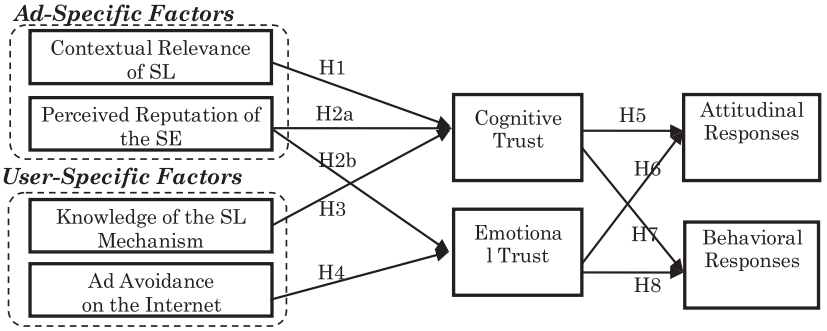


Fig. 1. Research model.

responses should be measured. It is usually the case that an advertiser's goals are a combination of the two types of responses – behavioral responses and attitudinal responses [Bergkvist and Melander 2000; Li and Leckenby 2004].

Moreover, studies have found that advertising on the Web has sizable effects on brand loyalty and attitudes that cannot be reflected in click-through [Bergkvist and Melander 2000; Bruner II and Kumar 2000; Dou et al. 2010; Poh and Adam 2002]. Dou et al. [2010] also verified that search results displayed in search result pages can generate branding impacts even without being clicked on. Therefore, the use of click-through rates alone is likely to undervalue the Web as an advertising medium. Therefore, it is desirable to include attitudinal responses such as brand awareness in order to evaluate the effectiveness of sponsored search advertising from a more comprehensive perspective.

3. RESEARCH MODEL AND HYPOTHESES

Grounded on the dual process model, we argue that trust-based attributes of SE advertising influence the individual's formation of trust attitude (including cognitive trust and emotional trust) which, in turn, influence the individual's responses to SE advertising (including attitudinal responses and behavioral responses), as depicted in Figure 1.

Previous studies on social psychology suggested that the behavior of an agent (i.e., a user of SE) is shaped on the basis of two important factors: the characteristics of the issues with which it is occupied – in our case, the ad-specific factors, and the user's own personal characteristics or state of mind – the user-specific factors [Gundersen 2014; Öztürk and Aamodt 1997]. Accordingly, ad-specific factors refer to factors related to the characteristics of SLs (e.g., content displayed or medium used), which can be controlled by advertisers; while user-specific factors are about the user's personal characteristics or propensities which depend on the users.

Many previous studies have validated the influence of ad-specific factors on the effectiveness of traditional types of Web advertisements primarily measured by click-through rate. Research findings show that ad features, such as color [Benbasat and Dexter 1986; Zhang 2000], size [Li and Bukovac 1999], animation [Hong et al. 2004a; Li and Leckenby 2004], location [Drèze and Hussherr 2003], content [Tam and Ho 2006], information format (list vs. matrix) [Hong et al. 2004b] and information presentation mode (text vs. picture) [Chau et al. 2000], can influence users' information processing performance. These studies mainly focus on the interface stimuli of Web advertisement. However, as part of the results returned by SEs, SLs possess specific characteristics that are different from other types of online ads. For example, ad ranking [Gupta and Mateen 2014; Yoo 2014], ad extensions [Gupta and Mateen 2014], and evidence type

(i.e., statistical, causal, and expert evidence) [Haans et al. 2013] have been identified as specific factors which can influence the ad performance of SLs. In the context of SE, users are task-oriented, whether they will process the information in SL or not depends on the relevance of SL to the users' searching task [Jansen et al. 2007a] as well as the trustworthiness of its source [Jansen et al. 2009]. Accordingly, we examined two factors concerning the characteristics of the SE advertising – the contextual relevance of SL and the perceived reputation of the SE.

On the other hand, user-specific factors (i.e., user's disposition) also play a key role in determining how people respond to objects [Areni et al. 2000; Benbasat and Dexter 1986], especially in online environment. Unlike in traditional media where advertisers have overwhelming control over the advertising procedure (i.e., which ads consumers see, when, and how), in the online environment, the control has switched from advertisers to consumers. Online users have the options of not paying attention to, becoming involved with or ignoring the ad. These personality variables include need for cognition [Cacioppo and Petty 1982; Tam and Ho 2005], risk-taking propensity [Jin and Villegas 2007; Moore and Gergen 1985], variety seeking tendency [Rohm and Swaminathan 2004], and ad avoidance tendency [Cho and Cheon 2004; Jin and Villegas 2007]. Practical studies revealed that people's lack of knowledge about the SL mechanism [Hotchkiss 2005] and people's propensity to avoid online ads might account for the ineffectiveness of SLs in generating click through on them [Jin and Villegas 2007]. However, very little empirical study has been done in examining these two factors in influencing the effectiveness of SL mechanism. In this study, we focus on investigating the impacts of these two user-specific factors – users' knowledge of the SL mechanism and users' extent of ad avoidance on the Internet.

Contextual Relevance of SL. Contextual relevance of SL in our study refers to the extent to which the content of SL is relevant to the specific search context. In general, context refers to any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application (i.e., SE advertising), including the user and applications themselves [Dey 2001]. For the commercial information seeking behaviors in search engines, context is more than the keyword, and could involve further information such as user profile, query stream, location, and previous expression [Wang et al. 2014]. For instance, when a user is trying to find the information for a restaurant, SE could return results containing more context-specific information such as ratings, address and phone number, and links directly to user reviews, etc. This more structured information fits the needs of the user, thus is expected to facilitate the user's decision making and provide them a more favorable experience. Context includes a set of elements that have some influences on users' intentions while performing an activity [Kaenampornpan and O'Neill 2004] (i.e., searching e-commerce information in SEs). An understanding of context enables application designers to better understand users' needs when accomplishing an activity.

The relevance of information is considered an important prerequisite to trust [Cyr 2008]. The provision of high contextual relevant SLs enables users to consider the SLs as highly pertinent to their needs, thereby helping them reduce the time and effort of information searching. The SL mechanism will be considered as more competence and integrity in providing users with useful information than when only simple, general description is provided. Therefore, we propose that the availability of context-specific information can enhance users' trust in the competence and integrity of SL mechanism in providing useful information via the central processing route. Compared to SL with general information as its summary, the SL with context-specific content will increase users' cognitive trust on the SL mechanism to a higher extent.

We anticipate that contextual relevance of SL should have a direct effect on cognitive, but not emotional trust, because the assessments of context-specific relevance employ an attribute evaluation process through central route [Petty and Cacioppo 1986]. It involves the rational evaluation of the relevance between the searching task and the content of the SLs generated. The attribute evaluation processing of contextual relevant information requires cognitive efforts, which are necessary for the formation of cognitive trust. The formation of emotional trust, however, does not involve the assessment of a specific aspect of a trustee, but relies on simple cues to form the general feeling of trust [Komiak and Benbasat 2006].

H1: Contextual relevance of SLs is positively related to a user's cognitive trust in SLs.

Perceived Reputation of SE. The reason why most online users just visit a handful of SEs when there are numerous SEs that have similar technologies, similar interfaces, and comparative performance is that they trust well-known SEs more than others [Jansen et al. 2007b]. Jansen et al. [2007b] conducted a laboratory experiment and found that branding matters even when searching, that is, SEs with high reputation are perceived to perform better than SEs with low or no reputation. McKnight et al. [1998] and Lowry et al. [2008] have also investigated how processes of reputation categorization could build cognitive-based trust. Reputation categorization is a process whereby people use the reputation of an entity to determine one's perception of its trustworthiness. Those with good reputation are categorized as trustworthy [Rice 2011]. This is because individuals tend to associate highly reputed names with high quality and credibility [Rice 2011]. The website's perceived reputation in terms of its expertise and trustworthiness was expected to be derived from the number of years it had been online and its degree of success in terms of market share, number of employees, capital, revenue, and monthly audience traffic and rankings reported by recognized sources in online audience tracking. When searching information in SEs, if individuals have high motivation and ability to process SLs (i.e., they are experienced users who have plenty of time to look for good deals), they tend to process the information via the central route. By taking the central route, SEs with high reputation will be perceived as possessing the competence and integrity to provide useful information with high quality, leading to the increase of users' cognitive trust through central route. Accordingly, we propose that:

H2a: Reputation of SE is positively related to a user's cognitive trust in SLs.

In some empirical studies [Kong and Hung 2006; Shek et al. 2002], it is observed that an initial trust is built on general impression of the website, instead of cognitive assessment of each trust-based attribute. It takes place when the motivation or ability to process SLs is low (i.e., for a user who is lack of searching experience or is under the condition of time constraint). In such situation, online users will rely on some simply cues, such as their impression on the SEs to form their trust perception. The peripheral process involves the use of heuristic cues to make simple inferences (e.g., people should agree with a trustworthy source). Trust can be transferred from one entity to another [Doney and Cannon 1997; Stewart 2003]. When users are exposed to SLs, they identify other entities and heuristic cues closely associated with them, such as a general impression or reputation about the SE, to infer their trustworthiness. A SE with high reputation will make users feel secure and comfortable to trust on the information, including the sponsored ads, displayed on it. Thereby, we have Hypothesis 2b.

H2b: Reputation of SE is positively related to a user's emotional trust in SLs.

Knowledge of SL Mechanism. Users' knowledge of the SL mechanism refers to the amount of knowledge the users possess about how the SL mechanism works. Trust

develops when one gains knowledge about a trustee [Gefen et al. 2003; Wang and Benbasat 2007], allowing one to predict and interpret a trustee's behavior [Doney and Cannon 1997; Lewicki and Bunker 1995]. Users' knowledge of the SL mechanism can be obtained in two ways. One is the processing of the explanation and information about the sponsored ads mechanism, and the other is to gain knowledge through the interaction with the SE implementing this mechanism. A better knowledge of the SL mechanism can increase users' cognitive trust on the competence and integrity of the SEs by reducing the information asymmetry between users and SEs, and the behavioral uncertainty of users [Animesh et al. 2010; Wang and Benbasat 2007].

We anticipate that knowledge of the sponsored search mechanism should have a direct effect on cognitive, but not emotional trust, because awareness of the technical mechanism and the principles SE implements to ensure the quality of SLs both require cognitive effort to employ an attribute evaluation process [Petty and Cacioppo 1986], and thus influence user's trust via the central route. Therefore, we hypothesize that:

H3: A user's knowledge of the SL mechanism is positively related to the user's cognitive trust in SLs.

Ad Avoidance on the Internet. Ad avoidance refers to Internet users' tendency to avoid anything that looks like an ad on the Internet [Cho and Cheon 2004]. Previous empirical studies or surveys have shown that many users have biases toward SLs. It affects the effectiveness of this type of online advertising in attracting potential customers [Greenspan 2004; Hotchkiss 2005; Langford 2000]. The bias may come from the general tendency of these people to avoid ads on the Internet [Clemons 2009]. When the motivation or ability to process SLs is low, users are likely to rely on simply cues, such as their instinctive feeling towards online advertising. In this situation, users with very low tendency to avoid online ads may go beyond available evidence to feel assured and comfortable about relying on the trustee [Komiak and Benbasat 2004], while users with high tendency to avoid online ads may subconsciously ignore the ads no matter what information the ads contain. This process affects users' emotional trust via peripheral route. Thus, we propose:

H4: The level of a user's ad avoidance on the Internet is negatively related to the user's emotional trust in SLs.

Attitudinal Responses. In online environments, the attitudinal responses to online advertising refer to an individual's ad-related and brand-related responses generated by online ads and could be measured by advertising recall, brand recall, and brand attitude [Bergkvist and Melander 2000]. In the context of SE, after being exposed to the SLs, online users process SLs to a lesser or greater extent. As the results of this processing, some of them learn the content of SLs, including, the brand of the product, the claim of the product, the advertiser's name and the characters of the product. Consequently, the effectiveness of SLs in generating users' attitudinal responses can be measured by the accuracy of the advertising recall. Studies of cognitive elaboration have revealed that memory for stimuli is a function of the amount and nature of cognitive activity at encoding [Jacoby and Craik 1979; Tam and Ho 2005; Wyer and Srull 1989].

We used the dual process framework to investigate how trust-based variables take different routes to influence users' attitudinal responses to SLs. The dual process model postulates that the stimuli (i.e., the trust-based factors) exert influences on individual's elaboration (i.e., process and remember SLs) through two routes – the central route and the peripheral route. Under the central route, with higher level of cognitive trust towards the SL mechanism, individuals are motivated to rationally evaluate the content and quality of the SLs more deeply. The enhanced elaboration at

encoding leads to superior performance in recalling the central cues (e.g., brand and claim of product). Accordingly, we hypothesize that:

H5: A user can recall the content of SLs more accurately when the user possesses high level of cognitive trust than when the user possesses low level of cognitive trust.

In contrast to central processing, detailed processing of persuasive arguments is avoided under peripheral processing. Individuals instead focus on heuristic cues, such as credibility of the advertiser and characters of the product when they process the content of SLs [Petty et al. 1983]. These peripherally oriented stimuli should be remembered better by subjects with higher emotional trust towards SL mechanism. Hence, we hypothesize the following:

H6: A user can recall the content of SLs more accurately when the user possesses high level of emotional trust than when the user possesses low level of emotional trust.

Behavioral Responses. When users are looking for some information in the SE, their cognitive trust may directly affect their behavior, because once the users believe that the SLs provided by the SE are of high quality and unbiased, they will consider these links as part of the results and will be likely to explore further by clicking on the links. Therefore, we propose that there is a direct effect of cognitive trust on behavior.

H7: A user is more likely to click on SLs when the user possesses a high level of cognitive trust than when the user possesses a low level of cognitive trust.

The relationship between attitude (i.e., emotional trust) and behavior (i.e., trusting behavior) has been long examined by social psychology researchers. The attitude-behavior theories argue that an individual's attitude toward performing a given behavior, which is the emotional evaluation of undertaking a specific behavior, will predict the individual's eventual behavior [Ajzen and Fishbein 1977; Petty et al. 1997]. Accordingly, users are more likely to click on SLs when they have a high level of emotional trust in SE advertising. Thus, we propose:

H8: A user is more likely to click on SLs when the user possesses high level of emotional trust than when the user possesses low level of emotional trust.

In line with dual process model, our research model (as shown in Figure 1) predicts indirect effects that (1) contextual relevance of SL, reputation of SE, and knowledge of SL mechanism would affect users' responses to SLs through cognitive trust; and (2) reputation of SE, and ad avoidance on the Internet would affect users' responses to SLs through emotional trust. In addition to the hypothesized indirect effects, we are also interested to recognize the possibility of direct effects from these four antecedents to users' responses to SLs. For example, contextual relevance may directly affect attitudinal responses, because for the SL with high contextual relevant information, the congruency between the SL information and the customers' expectation is likely to cause more selective attention and cognitive effort to encode the congruent information, leading to superior performance in recognizing the content of the SL. The test of mediation effects was performed and will be discussed later in the "Structural Model" section.

Control Variables. Individual differences such as differences in personality are believed to have influences on individual's cognitive behavior and attitude [Zmud 1979]. Personality refers to the cognitive and affective structures maintained by individuals to facilitate their adjustments to the events, people, and situations encountered in life [Zmud 1979]. Empirical studies revealed that trust propensity (the degree of intensity of a customer's natural inclination to trust other parties in general) [Lee and Turban

Table I. Experimental Design

		Perceived Reputation of SE			
		Low		*High*	
		Contextual Relevance of SL		**Contextual Relevance of SL**	
		Low	*High*	*Low*	*High*
Knowledge of the SL mechanism	*Low*	Group1 (23)	Group2 (21)	Group3 (21)	Group4 (24)
	High	Group5 (20)	Group6 (23)	Group7 (21)	Group8 (25)

2001] and preference for decision quality (the extent to which a customer would like to improve decision quality at the expense of increased effort) [Todd and Benbasat 1992] can influence consumer trust in Internet shopping. These two control variables are therefore included in our model.

4. RESEARCH METHOD

A $2 \times 2 \times 2$ design was employed in this experiment. The between-subject factors are contextual relevance of SL (high relevance vs. low relevance), reputation of SE (high reputation vs. low reputation), and knowledge of SL mechanism (high level of knowledge vs. low level of knowledge, which was manipulated). Each subject was randomly assigned to one of the eight experimental treatments, as shown in Table I.

4.1. Experimental Design

Create Real E-Commerce Search Queries. To simulate the searching scenarios in real world, we use real queries with commercial needs submitted by users. Eight e-commerce queries were extracted from a set of most frequently searched queries which were published in three popular websites, including Yahoo, PCWorld, and Search Engine Land.[1] We choose consumer electronic products in our experiment because our target participants (i.e., university students) have high interest in purchasing such items. In order to control for the influence of product knowledge, a pilot test that included 24 subjects was conducted. Subjects were asked to evaluate their familiarity with each product category by answering questions on a 7-point Likert scale adapted from Lastovicka and Gardner [1979], as shown in Table A.1 in the Appendix. Based on the evaluation scores, we selected four product categories (i.e., digital camera, ipod, laptop, and mobile phone) out of eight, with similar high familiarity to our subjects.

Generate Search Result Pages and Design Search Tasks. To elicit more natural responses from the subjects, treatment Web pages including organic links (OLs) and sponsored links (SLs) were taken from an actual SE, Google, and modified to fit the objectives of this study. By submitting the four selected queries to Google, the results were retrieved from the first two search result pages for each query. Out of the OLs obtained from Google for each category, 10 of them were randomly selected as organic results in the simulative Web page; sponsored results were selected from the set of retrieved sponsored listings. We chose to use 10 OLs because most users do not scroll down past the top 10 results on a Web page [Hotchkiss 2005]. The order of the results was randomized in order to control the influence of the contextual relevance of the organic results. Font type and location of SLs in each treatment were identical, while the content of SLs and the layouts of SEs differ according to the manipulations of independent variables. The order of SLs was also randomized in order to control the potential effects of ad rank on the likelihood of users' processing and clicking on the SLs [Jansen et al. 2013]. To further control the potential effect of trustworthiness of the sellers,

[1]The URLs of the Web pages are: http://searchengineland.com/online-holiday-shopping-stats-most-searched-gifts-15700, http://tech.yahoo.com/blogs/null/108862/2008s-top-ten-most-searched-tech-terms/, and http://www.pcworld.com/article/146161/the_100_best_products_of_2008.html.

Fig. 2. Examples of search engines with different levels of reputation.

we have also excluded those results with famous names such as the official websites of the searched products. The reputation of the remaining advertisers was evaluated in the pilot study, which showed that there was no significant difference among them. Each subject was required to perform four shopping tasks with a given scenario for each. The order of the shopping tasks was randomly designed and delivered to the subjects. Based on the feedbacks from the subjects in the pilot study, the scenarios and instructions are appropriate and clearly presented.

4.2. Manipulation and Manipulation Checks of Independent Variables (IVs)

Contextual Relevance of SL. For each shopping task, SLs are designed in two formats with the same title but different summary content. For the SLs with high contextual relevance, the results contain context-specific information such as customer ratings, address, price, and availability, etc. For the SLs with low contextual relevance, which is the most common format in real SE context, only a short description was shown. To control for potential confounding effects generated from manipulation design, the number of words has been made comparable and the size of links have been kept identical among different treatments.

A manipulation check for this variable was executed after a subject had finished all of the four shopping tasks. The subjects in all groups were asked to consider all the SLs they had seen on the results pages, and evaluate how relevant these links were to the shopping tasks in general (see Table A.2 in the Appendix). The average contextual relevance score for high level groups (groups 2, 4, 6, 8) was 3.47, whereas that for low-level groups (groups 1, 3, 5, 7) was 2.65 ($F(1,176) = 56.38$, $p < 0.01$), validating our manipulation of contextual relevance of SL.

Reputation of SE. The subjects in high reputation treatment (groups 3, 4, 7, 8) took their tasks in a simulated SE with the same appearance as Google. For subjects in low reputation treatment (groups 1, 2, 5, 6), they were assigned to take tasks in a SE with an imaginary name – Sieger. The content in these two websites were the same, whereas the appearance differed in the color of layout and the icon and position of logos (as shown in Figure 2). To check the manipulation of reputation of SE, subjects were required to answer six questions on a 7-point Likert scale adapted from Ohanian [1990] and Shamdasani et al. [2001] with minor revision to fit this study (see Table A.2 in the Appendix). The reliability of this construct was 0.94. The mean score for the high reputation groups was 5.22, while that for the low reputation groups was 3.76.

Google was perceived to have much higher reputation than Sieger ($F(1,176) = 207.31$, $p < 0.01$). Figure 2 shows examples of SEs with different levels of reputation.

Knowledge of SL Mechanism. To manipulate this factor, at the beginning of the experiment, half of the subjects were provided with a 15-minute presentation that introduced the working mechanism of SLs, such as how SLs are generated and what rules are established to ensure the quality of SLs. Another half of the subjects moved directly into the main experiment without this session. Two questions were asked to check the manipulation validity of this variable (see Table A.2 in the Appendix). As expected, subjects in high-knowledge groups reported better understanding of SL mechanism (2.87) than subjects in low-knowledge groups (2.21) ($F(1,176) = 27.88$, $p < 0.01$). The result validates our manipulation of this variable.

Ad Avoidance on the Internet. Ad avoidance on the Internet was measured by utilizing scales from Cho and Cheon [2004] with minor modifications to fit the study (see Table A.2 in the Appendix).

4.3. Measurements of Dependent Variables

Cognitive Trust and Emotional Trust. Although many components of cognitive trust (or trusting beliefs) exist in the literature (e.g., Butler [1991]), three components are utilized most frequently [Mayer et al. 1995; McKnight et al. 2002]. They are competence, integrity, and benevolence. Competence refers to the ability of the trustee to do what the truster needs. Integrity is about the trustee's honesty and promise keeping. Benevolence refers to the trustee's caring and motivation to act in the truster's interests. The distinctions among cognitive trust types are crucial [Chau et al. 2013], because the concerns of users vary among different contexts [McKnight et al. 2002]. For instance, in some online shopping websites whereby users may be required to disclose personal information for completing purchases, the users would be more concerned about the vendor's benevolence and integrity. Whereas in news websites, users should be more concerned about whether the website has the competence and integrity to deliver the latest news with sufficient authenticity. In the context of SEs, users may be more concerned about competence and integrity, because risks mainly come from being exposed to irrelevant information or being transferred to undesired websites. We did not include cognitive trust in benevolence, because in the context of SEs, searchers are mainly concerned about whether the SE has the competence required to provide them with highly relevant and unbiased results for their queries. Benevolence is the perception that the trustee intends to act in the truster's interest [McKnight et al. 2002]. It is difficult for searchers to form the perception that SE can exhibit care and goodwill that go beyond the characteristics judged from the SE's performance [Komiak and Benbasat 2006]. In addition, with limited exposure to the website, subjects could not have the time to develop trusting beliefs in terms of the SE's caring and motivation to act in the users' interests. Furthermore, subjects from the pilot tests suggested that questions on benevolence belief seem to be unsuitable in the context of this study, because while conducting searching tasks in the context of SEs, subjects are more concerned about the quality, especially the relevance, of the results.

Unlike cognitive trust, emotional trust does not have multiple dimensions. Prior studies [Komiak and Benbasat 2006; Swan et al. 1999] suggest that people's feelings tend to regard a trustee as a whole. It is a general feeling of being secure and comfortable to rely on the trustee [Komiak and Benbasat 2004]. Once people start to assess a particular aspect of a trustee, trust moves from emotion to cognition.

Drawing from the above discussion, we developed the measures of cognitive trust and emotional trust by adapting items from scales reviewed and summarized in Hawes et al.

[1993], Plank et al. [1999], Swan et al. [1988], and Komiak and Benbasat [2006] with minor modifications to fit the context of this study. In selecting items, we tried to capture the aspects of the cognitive trust that were most relevant to the context of SEs. As a result, for competence, we measured perceptions of how well the SE did its job or how knowledgeable the SE was when delivering information (i.e., expertness/competence). The integrity items captured perceptions of the SE's honesty, truthfulness, sincerity, and keeping commitments (i.e., reliability/dependability). As with emotional trust, existing items were adapted from scales compiled in Swan et al. [1988] and Komiak and Benbasat [2006]. The measures are shown in Table A.3 in the Appendix. The validity and reliability of these measures will be discussed in the next section.

Attitudinal Responses. The recall test was designed in the typical form used in cognitive research [Ray and Reingold 2003]. It was a YES-NO recall test. The purpose of this test was to assess subjects' recall capability on SLs under different manipulation of IVs. The subjects answered questions by clicking on the "YES" or "NO" buttons to indicate whether they had seen the content of SLs during the experiment. There were eight questions for each subject. Each question displayed the content of a SL and asked the subjects whether they had seen the SL on the results pages in the four tasks that they performed. Among these eight questions, four questions contain true SLs that really appeared during the four tasks in the experiment, while another four questions contain false SLs that actually never appeared. The answers were recorded and the number of correct responses in all the four shopping tasks was added to calculate the final attitudinal response score. The average numbers of correct responses in all treatments are reported in Table A.4 in the Appendix.

We used performance-based incentives (participants were informed that they will take part in a lucky draw and have a high chance to win a prize of HK $100 (about US $13) if they found the appropriate products and completed the questionnaire consistently) to ensure that subjects perform to the best of their ability. The recall test was conducted after they finished the Questionnaire I, which includes questions for demographic information, manipulation checks on IVs, and measures of variables.

Behavioral Responses. The behavioral response of a subject was measured by calculating the total number of clicks on SLs for each product in each of the four tasks. The click stream from each subject for every single task was recorded and saved in the database. The total number of clicks in the four tasks for each subject was summed to calculate the overall behavioral response of the subject. The average numbers of clicks in all treatments are reported in Table A.4 in the Appendix.

4.4. Subjects and Experimental Procedures

Two hundred and twenty undergraduate students from a major university in Asia were invited to take part in the experiment. After cleaning the incomplete data and inconsistent answers (e.g., answers of reverse-scored items), there were 178 valid data points remained for the final data analysis. Of the 178 subjects, 98 were males and 80 were females. Their average age was 19.43 years. Most participants (96.6%) had Internet experience of more than 5 years. 78.7% of them had online shopping experience. We believed that the subjects had sufficient Internet skills to complete the experimental tasks.

Subjects were randomly assigned to one of the eight treatment groups listed in Table I. The number of subjects in each group varies from 20 to 25 and is shown in parentheses in the table. All the experimental sessions were conducted in a laboratory with 30 identical Pentium 4 PCs connected to the Internet. An online website, written in ASP.NET, was developed specifically for the experiment. It was installed

on two servers in the same local area network as the PCs in the laboratory to ensure a consistent high network speed for all subjects. Background checks indicated that there was no significant difference between groups in terms of Internet experience and online shopping experience. The incentive for participation was one course point and the chance to win a prize of HK$100 (about US $13).

Subjects were allowed to take as much time as they wanted to complete their shopping tasks. Most subjects spent around 40 minutes (mean = 42.618 mins; SD = 24.554 mins) to finish the procedures excluding the introduction session given at the beginning of the experiment. The procedures were:

(1) At the beginning of the experiment, half of the subjects (groups 5, 6, 7, and 8) were provided with a 15-minute lecture introducing the working mechanism of SE advertising. Another half of the subjects moved directly to the next step.
(2) Subjects read an online participation consent form and decided whether to attend this experiment. Subjects read the introduction Web page stating what they were supposed to do during the information searching session. In this introduction, subjects were told to conduct four shopping tasks using a search engine (Google or Sieger) as the starting point of the whole consumer decision-making process [Kotler 1997]. For each task, a scenario was first given. Then the subjects were provided with the results page and were asked to make their decisions based on the provided information without seeking further information through any other search engines. Each subject was asked to complete two general tasks and two specific tasks. For general tasks, subjects were asked to explore more information for future purchase and indicate which linked website is the most informative. For example, the following scenario was given for one of the general tasks: "You are interested in the latest generation of mobile phone – 3G mobile phone. So you want to find out more information about it, such as prices, desirable features, and the most popular types." While for the specific tasks, subjects were required to choose particular products according to specific requirements (such as a shop with the highest rating or the price within a given budget) and indicate the website they are going to make the purchase (the detailed scenario can be provided on request). For example, for one of the specific tasks, the following scenario was presented: "You need a portable digital camera with high quality and good price. After consulting with your friends, you decide to buy Canon IXUS 110 IS for yourself. Your budget is US$310. Find one that meets your needs." To familiarize them with the website and the shopping process, a demonstration was given to illustrate how to complete a shopping task step by step.
(3) After conducting the four shopping tasks, subjects completed Questionnaire I, which included questions for demographic information, manipulation checks on IVs, and measures of variables.
(4) Subjects were asked to take a memory test and answered questions by clicking on the "YES" or the "NO" buttons to indicate whether they recognized the content of these links during the four tasks in the experiment.
(5) Subjects completed Questionnaire II for the measurement of control variables.

5. DATA ANALYSIS AND RESULTS

To further verify that our manipulations were effective and to investigate any potential interactions, MANCOVA and ANCOVA tests were carried out. We first performed preliminary analyses and confirmed that multivariate normality, homogeneity of covariance matrices, and factor structure assumptions were met. Next, we conducted factorial MANCOVA test on the measures of cognitive trust and emotional trust with ad avoidance as covariate. The results reveal significant treatment effects ($p < 0.05$).

Table II. ANCOVA Results on Cognitive Trust

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	26.007[a]	8	3.251	4.027	.000	.160
Intercept	428.682	1	428.682	530.968	.000	.759
Ad Avoidance on the Internet	1.195	1	1.195	1.480	.225	.009
Contextual Relevance (CR)	7.136	1	7.136	8.838	.003	.050
Perceived Reputation (REP)	9.446	1	9.446	11.700	.001	.065
Knowledge of SL Mechanism	4.272	1	4.272	5.291	.023	.030
CR ∗ REP	.660	1	.660	.818	.367	.005
CR ∗ KLD	.085	1	.085	.106	.745	.001
REP ∗ KLD	.828	1	.828	1.025	.313	.006
CR ∗ REP ∗ KLD	.038	1	.038	.047	.829	.000
Error	136.444	169	.807			
Total	3810.280	178				
Corrected Total	162.451	177				

a. R Squared = .160 (Adjusted R Squared = .120).

Table III. ANCOVA Results on Emotional Trust

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	49.096[a]	8	6.137	6.782	.000	.243
Intercept	279.690	1	279.690	309.085	.000	.647
Ad Avoidance on the Internet	18.729	1	18.729	20.697	.000	.109
Contextual Relevance (CR)	3.920	1	3.920	4.332	.039	.025
Perceived Reputation (REP)	11.811	1	11.811	13.053	.000	.072
Knowledge of SL Mechanism	4.257	1	4.257	4.704	.031	.027
CR ∗ REP	.258	1	.258	.285	.594	.002
CR ∗ KLD	1.204	1	1.204	1.331	.250	.008
REP ∗ KLD	1.676	1	1.676	1.852	.175	.011
CR ∗ REP ∗ KLD	.973	1	.973	1.075	.301	.006
Error	152.928	169	.905			
Total	3526.438	178				
Corrected Total	202.024	177				

a. R Squared = .243 (Adjusted R Squared = .207).

The interaction effect among the three manipulations and one covariate, however, was not found to be significant either for cognitive trust or emotional trust. ANCOVA tests were further conducted on cognitive trust and emotional trust separately. We set the significance level at 0.025 (0.05/2) to control for Type I error inflation arising from multiple tests. Tables II and III show a summary of the results.

Table II shows that content relevance ($p < 0.01$) and reputation of SE ($p < 0.01$) have significant direct effect on cognitive trust. There is no significant interaction effect between these IVs.

Table III shows that reputation of SE ($p < 0.001$) and ad avoidance ($p < 0.001$) have significant direct effect on emotional trust. There is no significant interaction effect between these IVs.

SmartPLS version 2.0 was used as the analytical tool. SmartPLS is a modeling software application based on the partial least squares (PLS) method – a component-based SEM technique. There are mainly two types of SEM techniques: the covariance-based SEM (exemplified by statistical tools such as LISREL and AMOS) and the component-based SEM (exemplified by PLS-Graph and SmartPLS). We chose the component-based SEM approach instead of covariance-based SEM because the theories underpinning our research model are not well-developed in the IS literature. The component-based SEM

is more suitable for predictive applications and theory building [Gefen et al. 2000]. Moreover, covariance-based SEM techniques only allow reflective constructs [Gefen et al. 2000], while "Attitudinal responses" and "Behavioral responses" are observed variables rather than reflective latent variables.

PLS analysis can provide a structural model and a measurement model simultaneously for the analysis of experimental data, with the measurement model testing the reliability and validity of measures, and the structural model testing relationships among constructs.

5.1. Measurement Model

The two latent variables in the research model, namely cognitive trust and emotional trust, are reflective constructs. They act as mediators between independent variables and dependent variables. The two dependent variables are users' attitudinal responses and behavioral responses to SLs. They were measured by the results of memory test and the total number of clicks, respectively.

We use manipulation check scores as the inputs of independent variables [Komiak and Benbasat 2006; Sia et al. 2009; Zhang et al. 2011], because the scores of manipulation check reflect the participants' perceptions of the contextual relevance of SLs and the reputation of SE affected by the treatments, and their knowledge of SL mechanism. To make the results in SmartPLS more interpretable, we inverted the scale of ad avoidance on the Internet to have it with positive correlations with all LVs.

Reliability. To see whether the measures of latent constructs are error-free [Straub et al. 2004], internal consistency of these constructs were assessed by calculating the composite reliability. As shown in Table IV, all values of composite reliability are above 0.92, indicating a high level internal consistency of constructs [Barclay et al. 1995; Fornell and Larcker 1981].

Construct Validity. Construct validity is assessed by both convergent validity and discriminant validity. A good convergent validity is demonstrated when: (1) factor loadings are significant (e.g., t-statistics > 1.96, at 0.05 level) and greater than 0.707 [Carmines and Zeller 1979]; and (2) AVE (Average Variance Extracted) of each latent variable is above 0.5 [Fornell and Larcker 1981]. As shown in Table IV, all the reflective constructs display strongly positive loadings (loadings > 0.7) and high levels of statistical significance for all items. Similarly, AVE of each latent variable is above 0.67, which demonstrates good convergent validity.

Discriminant validity is evidenced when measures posit to reflect a given construct differ from those that are believed not to represent the construct [Straub et al. 2004]. It reflects the extent to which the measure for each construct is distinctly different from each other. Discriminant validity is assessed by examining (1) factor analysis results, (2) cross-loadings, and (3) the relationship between correlations among constructs and the square root of AVEs [Chin 1998; Fornell and Larcker 1981]. Factor analysis results (Table V) indicate good discriminant validity as all measurement items load highly on the constructs they measured but not highly on other constructs. Cross-factor loadings as shown in Table VI also indicate good discriminant validity as the loading of each measurement item on its assigned latent variables is larger than its loadings on any other constructs [Chin 1998; Gefen et al. 2000; Straub et al. 2004]. Table VII also shows good discriminant validity because the square root of AVE is greater than the inter-construct correlations [Barclay et al. 1995; Fornell and Larcker 1981].

The results of measurement model show both good reliability and good construct validity. Regarding other potential effects, we performed ANOVA tests in SPSS to examine whether Internet experience or online shopping experience had effects on cognitive trust, emotional trust, recall accuracy and number of clicks.

Table IV. Reflective Constructs: Loadings, T-Statistics, AVE

Items	Loadings	Std. Error	T-statistics[a] (Bootstrap)	AVE	Composite Reliability	Cronbach's Alpha
Perceived Reputation of SE						
REP1	0.92	0.012	76.338***	0.719	0.94	0.92
REP2	0.851	0.028	30.351***			
REP3	0.803	0.033	24.646***			
REP4	0.839	0.035	24.270***			
REP5	0.838	0.026	32.148***			
REP6	0.831	0.031	27.009***			
Ad Avoidance on the Internet						
AA1	0.867	0.021	42.259***	0.673	0.92	0.9
AA2	0.877	0.026	34.154***			
AA3	0.882	0.024	37.112***			
AA4	0.773	0.042	18.416***			
AA5	0.789	0.046	17.187***			
AA6	0.722	0.058	12.417***			
Cognitive Trust						
CT1	0.826	0.028	29.030***	0.7	0.92	0.89
CT2	0.876	0.018	47.390***			
CT3	0.841	0.026	31.999***			
CT4	0.801	0.036	22.113***			
CT5	0.839	0.032	26.015***			
Emotional Trust						
ET1	0.893	0.018	50.181***	0.812	0.95	0.92
ET2	0.906	0.015	60.873***			
ET3	0.914	0.013	71.500***			
ET4	0.892	0.017	53.236***			

Note: ***indicates significance at the 0.001 level, two-tailed test unless otherwise noted.

Internet experience was found to have no significant effect on cognitive trust ($F(3,174) = 0.921$, $p > 0.1$), emotional trust ($F(3,174) = 0.140$, $p > 0.1$), recall accuracy ($F(3,174) = 0.122$, $p > 0.1$) and number of clicks ($F(3,174) = 0.577$, $p > 0.1$).

Also, online shopping experience had no effect on cognitive trust ($F(4,173) = 0.740$, $p > 0.1$), emotional trust ($F(4,173) = 0.860$, $p > 0.1$), recall accuracy ($F(4,173) = 0.633$, $p > 0.1$) and number of clicks ($F(4,173) = 0.854$, $p > 0.1$).

There were also no significant differences between groups in terms of control variables including trust propensity ($F(7,170) = 0.726$, $p > 0.1$), and preference for decision quality ($F(7,170) = 0.685$, $p > 0.1$). The definition, measures, and reliability tests of these two control variables are shown in Table VIII. With these checks on control variables and the random assignment of subjects to each treatment, we believe that the effect of confounding factors is minimized and controlled for in the current study.

5.2. Structural Model

In PLS analysis, the validity of a model is mainly evaluated by examining R2 and the structure path. As shown in Figure 3, an approximate 63.2% variance in cognitive trust and 24.6% variance in emotional trust are accounted for by IVs. Approximate 39.3% variance in users' attitudinal responses to SL is accounted for by cognitive trust and emotional trust, and approximate 35.3% variance in users' behavioral responses is accounted for by cognitive trust and emotional trust. Eight out of nine hypotheses are supported (as noted in Figure 3 and Table IX). The endogenous variables in the research model exhibit high R2 values and most paths in the research model are statistically significant. These results indicate a strong prediction power of the current model.

Table V. Factor Analysis Results

	Perceived Reputation of SE (REP)	Ad Avoidance on the Internet (AA)	Cognitive Trust (CT)	Emotional Trust (ET)
REP1	**0.875**	−0.009	0.268	0.087
REP2	**0.827**	−0.050	0.241	−0.030
REP3	**0.782**	−0.007	0.138	0.114
REP4	**0.831**	0.064	0.099	0.115
REP5	**0.820**	0.063	0.117	0.131
REP6	**0.826**	−0.031	0.071	0.164
AA1	0.016	**0.823**	0.040	0.191
AA2	0.076	**0.842**	0.013	0.170
AA3	−0.026	**0.843**	0.021	0.209
AA4	−0.007	**0.751**	0.059	0.129
AA5	−0.040	**0.827**	0.049	0.024
AA6	0.019	**0.791**	0.040	−0.072
CT1	0.266	0.016	**0.731**	0.238
CT2	0.186	0.034	**0.768**	0.336
CT3	0.113	0.039	**0.779**	0.306
CT4	0.248	0.068	**0.801**	0.095
CT5	0.107	0.029	**0.766**	0.341
ET1	0.165	0.204	0.330	**0.790**
ET2	0.197	0.148	0.411	**0.766**
ET3	0.187	0.176	0.434	**0.749**
ET4	0.103	0.256	0.402	**0.743**

Note: SPSS was used for factor analysis. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Table VI. Correlations between Measures and Latent Variables

	Ad Avoidance on the Internet (AA)	Perceived Reputation of SE (REP)	Cognitive Trust (CT)	Emotional Trust (ET)
AA1	**0.867**	0.048	0.146	0.339
AA2	**0.877**	0.095	0.136	0.322
AA3	**0.882**	0.010	0.127	0.341
AA4	**0.773**	0.025	0.119	0.296
AA5	**0.790**	−0.017	0.066	0.241
AA6	**0.722**	0.020	0.040	0.171
REP1	0.023	**0.920**	0.453	0.357
REP2	−0.032	**0.851**	0.367	0.242
REP3	0.025	**0.804**	0.334	0.294
REP4	0.087	**0.839**	0.326	0.296
REP5	0.090	**0.838**	0.338	0.319
REP6	0.011	**0.831**	0.317	0.292
CT1	0.086	0.414	**0.828**	0.564
CT2	0.121	0.361	**0.876**	0.644
CT3	0.124	0.300	**0.839**	0.619
CT4	0.121	0.401	**0.803**	0.511
CT5	0.125	0.296	**0.836**	0.633
ET1	0.331	0.314	0.596	**0.894**
ET2	0.283	0.356	0.660	**0.905**
ET3	0.307	0.350	0.671	**0.914**
ET4	0.373	0.264	0.633	**0.891**

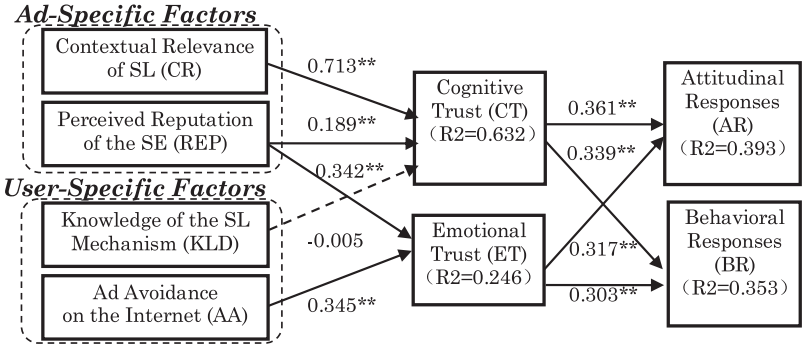
Table VII. Construct Correlations and the Squared Roots of AVEs

	REP	AA	CT	ET
Perceived Reputation	**0.848**			
Ad Avoidance	0.040	**0.821**		
Cognitive Trust	0.422	0.137	**0.837**	
Emotional Trust	0.356	0.359	0.711	**0.901**

Note: Diagonal elements are the square roots of average variance extracted (AVE). For adequate discriminant validity, diagonal elements should be greater than corresponding off-diagonal elements (inter-construct correlations).

Table VIII. Definition, Measures, and Reliability Tests of Control Variables

Control Variables	**Cronbach's Alpha**
Trust Propensity (reflective) (Source: Lee et al. [Lee and Turban 2001])	
Definition: the degree of intensity of a customer's natural inclination to trust other parties in general.	
1. It is easy for me to trust a person/thing.	
2. My tendency to trust a person/thing is high.	0.940
3. I tend to trust a person/thing, even though I have little knowledge of it.	
4. Trusting someone or something is not difficult.	
Preference for Decision Quality (reflective) (Source: Todd et al. [Source: Todd and Benbasat 1992])	
Definition: the extent to which a customer would like to improve decision quality at the expense of increased effort for shopping.	
1. I am willing to examine the relevant information very carefully in order to make sure that the product/service fits my preferences perfectly.	0.839
2. I prefer to explore with great efforts in order to get exactly what I want.	



Note 1: Significant paths are represented by solid arrows and insignificant paths by dashed arrows.
Note 2: ** means significant at the 0.01 level.

Fig. 3. Results of PLS Analysis.

In order to test the robustness of our results, we also re-run the analysis with the missing links (i.e., the relationship between CR & ET, KLD & ET, and AA & CT) included. The test results show that the missing links between KLD & ET ($\beta = -0.044$, $p = 0.478$) and AA & CT ($\beta = 0.087$, $p = 0.047$) are not significant. Although the link between CR and ET is significant, it can be explained by the full mediation effect of

Table IX. The Structural Model

Path	Direct Effect	T-Statistic	Hypothesis
Contextual Rel. → Cog. Trust	0.713	32.722**	H1: Supported
Perceived Rep. → Cog. Trust	0.189	6.991**	H2a: Supported
Perceived Rep. → Emo. Trust	0.342	8.759**	H2b: Supported
Knowledge → Cog. Trust	−0.005	0.163	H3: Not supported
Ad Avoidance → Emo. Trust	0.345	8.212**	H4: Supported
Cog. Trust → Attitudinal	0.361	7.506**	H5: Supported
Emo. Trust → Attitudinal	0.317	6.282**	H6: Supported
Cog. Trust → Behavioral	0.339	6.540**	H7: Supported
Emo. Trust → Behavioral	0.303	5.328**	H8: Supported

Note: ** indicates significance at the 0.01 level.

Table X. Results of Mediating Effect Tests

			Coefficient in Regressions				
					IV+M→DV		
IV	**M**	**DV**	**IV→DV**	**IV→M**	**IV**	**M**	**Mediating**
CR	CT	AR	0.583**	0.775**	0.320**	0.339**	Partial
CR	CT	BR	0.469**	0.775**	0.097	0.480**	Full
REP	CT	AR	0.393**	0.433**	0.176**	0.512**	Partial
REP	CT	BR	0.278**	0.433**	0.055	0.532**	Full
REP	ET	AR	0.393**	0.362**	0.216**	0.497**	Partial
REP	ET	BR	0.278**	0.362**	0.097	0.510**	Full
AA	ET	AR	0.224**	0.363**	0.030	0.564**	Full
AA	ET	BR	0.445**	0.363**	0.289**	0.443**	Partial

CR – Contextual Relevance of SL; REP – Perceived Reputation of SE; AA – Ad Avoidance on the Internet; CT – Cognitive Trust; ET – Emotional Trust; AR – Attitudinal Responses; BR – Behavioral Responses.
Note: ** indicates significance at the 0.01 level.

cognitive trust between CR and ET.[2] The results show that our hypotheses are robust to alternative models.

To analyze the mediating effects of cognitive trust and emotional trust between four trust antecedents, namely contextual relevance of SL, reputation of the SE, knowledge of the SL mechanism, and ad avoidance on the internet, and users' responses to SLs, the three-step method [Baron and Kenny 1986] was employed. Mediating effect is evidenced when all conditions in the set of three equations hold in the predicted direction. The results are shown in Table X.

6. RESULTS AND FINDINGS

The findings displayed in Figure 3 and Table IX support the primary hypotheses that contextual relevance of SL ($\beta = 0.713$, $p < 0.01$) and reputation of SE ($\beta = 0.189$, $p < 0.01$) significantly increase cognitive trust, especially the contextual relevance of SL. Once a user is exposed to SLs when seeking information in a SE, the availability of context-specific information can offer opportunities to establish and enhance the user's beliefs in the competence of this mechanism, leading to a higher extent of cognitive trust. The high-path coefficient of contextual relevance of SL also reveals that it is the most important factor in explaining users' trust in SL mechanism. This finding is consistent with the assumption that the SE context is more task-oriented, and thus the relevance of ads to the searching task is a significant concern among searchers.

[2]The effect of CT remains significant after controlling for CR ($\beta = 0.781$, $p < 0.01$), while the effect of CR is no longer significant when CT is controlled ($\beta = -0.086$, $p > 0.1$).

However, knowledge of the SL mechanism does not significantly increase a searcher's cognitive trust in SL mechanism; therefore, H3 is not supported. There could be some factors that led to such a result. One possible reason is that no matter whether the subjects had high or low knowledge of SL mechanism, their primary concern was relevance when they had particular goals in mind. For subjects whose knowledge of SL mechanism was high, they were likely to view SLs primarily as advertisements. They only appreciated these links if they were very relevant to their shopping tasks. For subjects whose knowledge of SL mechanism was low, it was highly possible that some of them were just unaware of the distinction between SLs and OLs [Fallows 2005]. They just considered the SLs as part of the search results and processed them in the same way as OLs. Under this situation, the knowledge of SL mechanism failed to effectively improve users' cognitive trust.

Reputation of SE ($\beta = 0.342$, $p < 0.01$) and ad avoidance on the Internet ($\beta = 0.345$, $p < 0.01$) have significant direct effects on users' emotional trust. These direct effects on users' emotional trust indicate the existence of emotional processes that produce emotional trust directly, which are complementary to the cognitive processes that produce cognitive trust. The results illustrate that by improving the reputation of SEs or mitigating users' ad avoidance on the Internet, SEs will be able to make users feel more secure and comfortable to consider SLs for their searching decisions.

Both cognitive trust and emotional trust contribute significantly to users' attitudinal responses to SLs (measured by the accuracy of recall test) and their behavioral responses toward SLs (measured by the total number of clicks on SLs). While both components affect users' responses, the cognitive trust is more important than emotional trust in determining both attitudinal responses and behavioral responses. The total effect of cognitive trust ($\beta = 0.361$, $p < 0.01$) is higher than that of emotional trust ($\beta = 0.317$, $p < 0.01$) on users' attitudinal responses to SLs. Similarly, the total effect of cognitive trust ($\beta = 0.339$, $p < 0.01$) is higher than that of emotional trust ($\beta = 0.303$, $p < 0.01$) on users' behavioral responses to SLs. This is because in the context of SE, users are task-oriented searchers whose responses are more easily influenced by task-relevant attributes of the provided information. The results shown in Table X reveal that cognitive trust only partially mediates the impacts of contextual relevance and reputation of SE on users' attitudinal responses, while it fully mediates the impacts of contextual relevance and reputation of SE on users' behavioral responses. Emotional trust only partially mediates the impact of ad avoidance on users' behavioral responses, while it fully mediates the impact of ad avoidance on users' attitudinal responses.

7. DISCUSSION AND CONCLUSIONS

7.1. Theoretical Implications

The first theoretical contribution comes from evaluating the effectiveness of SE advertising from a more comprehensive perspective. Unlike most previous research which only takes into account the consumers' behavioral responses when measuring the effectiveness of online advertising, our research proposed that SE advertising could generate not only the behavioral responses from users, but the attitudinal responses as well. The results of our experiment have provided empirical evidence for this proposition, and thus contribute to the literature of online advertising by verifying and reinforcing the attitudinal effects (e.g., brand effects) of online advertising.

Second, drawing upon the dual process model, we managed to explain how external physical stimuli take effects on people's internal psychological significance by treating trust components as mediators between the relevant trust-based variables and users' responses. The findings of this research provide strong evidence that trust components (i.e., cognitive trust and emotional trust) account for a considerable amount of

variance of users' responses to SE advertising. Users' trust in SE advertising, acting as a mediator, helps us specify how and why certain stimulus can have impacts on users' responses to the SLs. In addition, this study theoretically argues and empirically validates the importance to include emotional aspect of trust in future research on online trust. Based on trust literature and dual process model brought from social psychology literature, we conceptualize users' trust as having cognitive and emotional dimensions in SE advertising. Though the two dimensions are highly correlated, they are empirically distinguishable, and both dimensions of trust have unique antecedents. Contextual relevance of SL and reputation of SE are antecedents of cognitive trust but not emotional trust, while ad avoidance on the Internet is an antecedent of emotional trust but not cognitive trust. This study extends the literature by showing that emotional dimension of trust is different and complementary to cognitive trust, and has broadened our understanding of how users process SLs in SE advertising.

This study also contributes to theory by identifying the factors that could have effects on users' trust in SE advertising and therefore influence the effectiveness of SE advertising. Given the notable differences between the attributes of SE advertising and the attributes of other types of online advertising, findings from prior studies regarding the influential factors on the effectiveness of traditional online ads cannot be directly applied to the study of SE advertising. This study identifies antecedents of users' trust in SE advertising according to the specific features of SLs. Contextual relevance of SL, reputation of SE, and ad avoidance on the Internet contribute significantly in variance of cognitive trust and emotional trust, and in turn in the effectiveness of SE advertising.

Finally, since the general constructs of research model developed in this study: user-specific factors, ad-specific factors, cognitive trust, emotional trust, attitudinal response, and behavioral response all exist in context of other types of online advertising, it will be possible and valuable to generalize the model to the investigation of other online advertising. Moreover, the method of laboratory experiment in this study ensures that the effects of confounding factors have been controlled. Therefore, this study provides convincing results and a solid foundation upon which future research can be based.

7.2. Practical Implications

On a practical level, knowing how and why people respond to SE advertising equip practitioners with information about the approaches to evaluate the effectiveness of SE advertising, to assist researchers and practitioners in identifying better strategy to advance users' trust, and to help SE companies and website owners improve their designs and enhance customer trust in SE advertising, which will consequently help SE companies increase the effectiveness of SE advertising.

First, the results of this study shed light on how to measure the effectiveness of SE advertising in a more comprehensive and accurate way. Findings of the experiment have provided empirical evidence that SE advertising have attitudinal effects (e.g., advertiser's brand effect) on users. In other words, SE ads provide a significant amount of brand enhancement even without being clicked on. This should entail more focus on brand advertising. Although brand effect of traditional online display ads (e.g., banner ads, flash ads, etc.) has been known, whether this effect exists for SE ads has not been well identified. Given the text-based attribute of SE ads, which differentiate it significantly from other types of online ads, practitioners only adopt behavioral metrics (e.g., CTR, convention rate, etc.) to measure the effectiveness of SE ads. Attitudinal metrics are needed to be considered when measuring the effectiveness of SLs. Despite the importance of brand awareness, it has always been one of the hardest things to measure. Tactics can be considered from the following perspectives: (1) Measure the website traffic over time – Google Analytics users are able to easily track the number of

visits using branded keywords to arrive on website. By comparing the numbers before and after implementing SE advertising, advertisers will be able to know if the website traffic is increased because of SE advertising; (2) Measure search volume – Google provides tools, such as Google Adwords Keyword Planner and Google Trends, to check the volume of searches for the user's brand name. Advertisers can track it over time to see if search volumes are increasing after offering SLs.

Second, the findings of this study indicate that for SE companies, an increased focus on brand effects is likely to expand their advertising market. In order to gain more revenue from advertising, SE companies should try to demonstrate to advertisers that SE advertising can have brand effects. They could also provide optional features that allow advertisers to improve the brand awareness of their ads. For example, they could allow advertisers to make their brands more conspicuous in the SLs by highlighting the names of their websites or by adding their logos in the SLs. Experimental studies are required to figure out which way is more effective.

Third, theoretical and empirical evidence of the positive effects of contextual relevance of SL on users' cognitive trust and on users' responses to SLs can justify future efforts to design and provide more effective SLs that can benefit all parties that are involved. Through consumer profiling and systematic behavioral tracking techniques, practitioners will be able to deliver highly targeted, context-specific ads tailored for online users, making ads to be of assistance to users' online searching goals. For example, for product ads, business information such as sellers' rating [Ma et al. 2013], stock status, shipping information could be included in SLs. For service ads, including business information such as location, contact number [Gupta and Mateen 2014], and business hours, could make the SLs more contextual relevant and consequently improve the users' cognitive trust.

Another key implication is to enhance users' emotional trust in SE advertising. The results, indicated by β values from CT & ET to AR & BR in Figure 3, show that although cognitive trust and emotional trust are significantly different from each other in terms of influencing factors and formation mechanism, both of them can increase the two types of measure significantly. The multidimensional feature of trust indicates that it is not enough to only cognitively convince searchers of the competence and integrity of SE advertising. It is also important to induce users' emotional feelings of security and comfort of making reference to sponsored links during the searching tasks. Findings from this study indicate that reducing the users' ad avoidance on the Internet could be an effective way to achieve this goal. Ad avoidance on the Internet is formed because of perceived ad clutter, prior negative experience, and perceived goal impediment [Cho and Cheon 2004]. Therefore, for the long-term success of online advertising, it is important to build up users' trust on SE advertising and increase perceived incentive and utility for clicking on SLs. Collective efforts among various players in SE advertising to provide SLs with high quality may help to achieve this goal. More specifically, practitioners should avoid using deceiving techniques to entice people to click on their ads. For example, SLs need to be distinguishable from organic links.[3] Findings of research on traditional online advertising (e.g., banner ads, or pop-up ads) suggest that the unexpected appearance of advertising messages on the Internet disrupts users' tasks or goals and causes consumers to extensively avoid the noise [Cho and Cheon 2004]. Although SLs are perceived as less intrusive and somewhat useful due to its plain format and relevant content, providers still need to avoid the intrusiveness by controlling the presentation of the ads in terms of their size, placement, or color.

[3]To protect consumers from deception, the Federal Trade Commission had set up regulations of paid listing in SEs. It required SEs label these sponsored links to better convey that paid placement is being used. (http://128.197.26.36/law/central/jd/organizations/journals/scitech/volume102/sinclair.pdf).

7.3. Limitations

This study has several noted limitations. First, in this study, we have made SLs different in content between groups as contextual relevance manipulation. It should be noted that although we have made efforts to minimize the confounding effects by keeping the font, the font size, the color, the title, and the website name of a SL identical between different treatments, the difference of core content may still induce confounding effects on dependent variables. For example, the amount of provided information and the format in which the information is displayed may have effects on users' perception. However, given that the effects of contextual relevance dominate over the effects of format in influencing user's perception in task-oriented context, we believe that our contextual relevance manipulation is acceptable.

Second, a knowledge enhancing lecture was given before four out of eight treatments to manipulate knowledge of SL mechanism. It is possible that the manipulation might give the subjects cues about the goal of the experiment. Measures have been taken to reduce this potential influence. For example, the lecture was given as a supplementary lecture of an e-business course, without mentioning its relationship with the experiment followed. In addition, in the experimental instruction, participants were asked to explore relevant information or find out products as required by following their usual searching habits. Although it is difficult for subjects to guess the specific purpose of this study (i.e., the specific hypotheses) based on the information given, and the feedbacks collected from 24 subjects in our pilot study also validated our manipulation, it would be better if a hypothesis guessing question could be included in the post-task questionnaire.

Finally, more attractive incentives could be used to encourage subjects to take the experiment more seriously. It is possible that some subjects just participate to get one course credit without paying much attention to the tasks and questionnaires. We have tried to solve this issue by offering them performance-based incentive. Participants were informed that they would take part in a lucky draw and have a high chance (10%) to win a small cash prize as long as their answers are reasonable (e.g., found the appropriate products and provided consistent answers for reverse-scored items). From the main experiment, we found that most of the subjects spent 30 to 40 minutes to finish the whole procedure, indicating that subjects were spending quite a lot of effort in doing the experiment. However, the incentive would be stronger if the winning percentage was higher.

7.4. Future Research

As the literature on the mechanism of users' trust in online advertising is not fully developed, there are considerable opportunities for further research.

First, possible antecedents of users' trust in SE advertising could have been omitted. Therefore, an area of interest for future research should be a comprehensive study examining the potential antecedents from both the users' aspect (e.g., an individual's propensity to trust, users' familiarity with the products) and the advertisers' aspect (e.g., the reputation of advertiser). Additional research could involve examining a broader spectrum of potential variables.

Second, we only consider the advertising and marketing effect of sponsored links, rather than organic links and their ranking, in this study. It would be interesting to study the joint advertising and marketing impact of organic links and sponsored links in search engines.

Third, it is desirable to further explore the underlying mechanism mediating the effect of stimuli on users' responses. The two mediators discussed in this study, cognitive

trust and emotional trust may not thoroughly account for users' responses to SLs, other possible mediators need to be explored.

Fourth, given the diversity of variables related to psychological personal traits, a fruitful area would be to further consider moderators that may influence users' attitude and behavior. For example, goal specificity is likely to influence the effect of contextual relevance of SL on users' cognitive trust on SL. Goal specificity refers to the extent to which an explicit goal exists to which problem-solving activities are directed [Rossano and Reardon 1999]. As goal specificity increases, more attributes are required to be taken into account, thus more cognitive effort will be devoted to decision making. By providing the context-specific attributes, SLs will be perceived to be more relevant to a task and thus more trustworthy. This effect will be magnified further under high goal specificity than under low goal specificity. Further analysis of moderator variables will help to better specify when certain effects will hold.

Finally, the research model seems to be generalizable to other online advertising platforms, because the general constructs of users-specific factors, ad-specific factors, cognitive trust, emotional trust, attitudinal response, and behavioral response all exist in the context of other types of online advertising. Therefore, it will be possible and valuable to test the research model developed in this study in the contexts of other online advertising.

APPENDIX

Table A.1. Measures of Familiarity

Construct	Measures [Lastovicka and Gardner 1979]
Familiarity	1. I understand the features well enough to evaluate the product. 2. This is a product that interests me. 3. I have a preference for one or more brands in this product class. 4. This is a product for which I have no need whatsoever. 5. I am not at all familiar with this product.

Table A.2. Measures of Manipulation Checks and Independent Variable

Ad-Specific Factors	
Contextual relevance of SL (new measure)[1]	
1. Considering all the sponsored links you've seen on the results pages, please evaluate how relevant they are to the shopping tasks.	
Perceived Reputation of SE [Ohanian 1990; Shamdasani et al. 2001]	
When I use Google[2] to search, I feel that	
1. Google[2] is reliable.	2. Google[2] is honest.
3. Google[2] is untrustworthy. (reversed)	4. Google[2] is experienced.
5. Google[2] provides unqualified service. (reversed)	6. Google[2] is an expert in this service.
User-Specific Factors	
Knowledge of SL mechanism (new measure)	
1. With sponsored link advertising, the advertisers pay each time their links appear on the Google's results page. (True/False)	
2. Which of the following is a determinant / are determinants for the ranking of a sponsored link? (choose all that apply) (i) The highest amount the advertiser is willing to pay for a click on his/her ads.	

(Continued)

Table A.2. Continued

Ad avoidance on the Internet [Cho and Cheon 2004]
While surfing online,
1. I intentionally ignore any ads on the Internet.
2. I intentionally don't look at any ads on the Internet.
3. I intentionally don't pay attention to any ads on the Internet.
4. I intentionally don't click on any ads on the Internet, even if the ads draw my attention.
5. I have a tendency to hate any ads on the Internet.
6. I do anything to avoid ads on the Internet.

Note 1: Participants were asked to rate the contextual relevance of SL by clicking on the corresponding buttons of items varied from "Not at all relevant" to "Very relevant".
Note 2: For participants assigned to groups of low reputation treatment (i.e., Group 1, 2, 5, and 6), the name of SE "Google" was replaced by "Sieger".

Table A.3. Definitions and Measures of Latent Constructs

Measures	**Sources**
***Cognitive trust in SL mechanism*[1]**	
Def.: Users' rational assessment that SL mechanism has the necessary attributes to be relied upon.	
When I use Google[2] *to search,*	
1. I feel that Google's[2] SL mechanism is expert at providing useful advertised information.	Plank et al. [1999]
2. I feel that its SL mechanism has good knowledge about retrieving and recommending relevant information.	Hawes et al. [1993]
3. The SL information provided by Google[2] is trustworthy.	Hawes et al. [1993]
4. The SL information provided by Google[2] is unbiased.	Komiak & Benbasat [2006]
5. I consider Google's[2] SL mechanism to possess integrity.	Komiak & Benbasat [2006]
***Emotional trust in SL mechanism*[1]**	
Def.: The extent to which users feel secure and comfortable about relying on the SL mechanism.	
When I use Google[2] *to search,*	
1. I feel secure about referring to SLs for my decision.	Swan et al. [1988]
2. I feel comfortable about referring to Google's[2] SLs for my decision.	Komiak & Benbasat [2006]
3. I feel confident about referring to Google's[2] SLs for my decision.	Komiak & Benbasat [2006]
4. I feel content about referring to SLs for my decision.	Komiak & Benbasat [2006]

Note 1: Participants were asked to only consider the performance of the particular SE in providing useful SL information. They were asked to indicate the degree to which they would agree with the above statements on a scale of 1 (strongly disagree) to 7 (strongly agree).
Note 2: For participants assigned to groups of low reputation treatment (i.e., Group 1, 2, 5, and 6), the name of SE "Google" was replaced by "Sieger".

Table A.4. Descriptive Statistics of Dependent Variables

	Average No. of Correct Responses	**Average No. of Clicks**		**Average No. of Correct Responses**	**Average No. of Clicks**
Group1	4.13	1.26	Group5	4.90	2.15
Group2	4.81	2.10	Group6	5.52	2.91
Group3	4.62	2.19	Group7	5.24	2.71
Group4	5.54	3.29	Group8	5.88	3.44

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