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A Picture is Worth a Thousand Words: Source Credibility Theory Applied to Logo and Website Design for Heightened Credibility and Consumer Trust

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Websites are often the first or only interaction a consumer has with a firm in modern commerce. Because consumers tend to make decisions within the first few seconds of online interaction, the first impression given to users can greatly determine a website's success. Leveraging source credibility theory, a strategy is presented for building credibility derived from a user's initial impressions of a website, in online environments. The study demonstrates that logos designed to communicate traits of credibility (i.e., expertise and trustworthiness) can trigger positive credibility judgments about the firm's website and that this increase in perceived credibility results in greater trust and willingness to transact with the firm. In addition, the study demonstrates distinct effects on consumers' distrusting beliefs. The positive trust effects are magnified when the design of a website extends and complements the credibility-based logo design. This practice-supporting model further indicates how website designers can methodically design logos and websites that nonverbally communicate credibility information within the first few moments of a website interaction.

[Supplemental materials are available for this article. Go to the publisher's online edition of the *International Journal of Human–Computer Interaction* to view the free supplemental file: Online Appendix A.]

1. INTRODUCTION

Websites are often the first, and sometimes the only, interaction a consumer has with a firm. For many organizations, particularly in e-commerce, an inviting website is a key component to success. Research suggests that 80% of web surfers spend just a few seconds viewing a site before continuing to the next site (Peracchio & Luna, 2006). Moreover, most web users are unlikely to look past the first few pages of a website (Thompson, 2004). Thus, when a user views a website, the first impression made within a few seconds likely influences that user's decision to continue interacting with the site or to browse to another (Everard & Galletta, 2005; Lowry, Vance, Moody, Beckman, & Read, 2008; Robins & Holmes, 2008). The impression a user gets in those first few seconds is therefore crucial to the success of the website and firm (Everard & Galletta, 2005; Lowry et al., 2008).

Recent research regarding trust on the web has leveraged source credibility theory (SCT) to understand why some sites, and by proxy their sponsors, are judged more credible than others (Cheung, Luo, Sia, & Chen, 2009; Fogg, 1999, 2003a; Fogg, Marshall, Kameda, et al., 2001a; Fogg, Marshall, Laraki, et al., 2001; Robins & Holmes, 2008; Tseng & Fogg, 1999). SCT is an established theory (Berlo, Lemert, & Mertz, 1969; Hovland & Weiss, 1952) explaining how the persuasiveness of a communication is determined in part by the perceived credibility of the source of the communication. SCT has received much attention in the communication literature (Berlo et al., 1969; Chung, Fink, & Kaplowitz, 2008; Cole & McCroskey, 2003; Hovland & Weiss, 1952; Jensen, 2008; Slater & Rouner, 1996; Yifeng & Sundar, 2010) and has been more recently applied to online contexts (Flanagin & Metzger, 2000, 2003, 2007; Fogg, 1998, 1999, 2003a; Fogg, Marshall, Kameda, et al., 2001; Fogg, Marshall, Laraki, et al., 2001; Fogg & Tseng, 1999; Robins & Holmes, 2008; Tseng & Fogg, 1999). SCT has also been successfully applied in many other contexts. The measurement scale used by Berlo et al. (1969), for example, has been adapted to measure perceived source credibility in organizational behavior (Widgery & Stackpole, 1972), marketing/selling (Simpson & Kahler, 1980), news/broadcasting (Bracken, 2006), and online contexts (Flanagin & Metzger, 2007; Johnson & Kaye, 2009; Kensicki, 2003; Robins & Holmes, 2008; Wathen & Jacquelyn, 2002). For a thorough review of source credibility and its

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applications, refer to Pornpitakpan (2004). Thus, the credibility of any communication, whether face-to-face, written, or electronic, has been found to be heavily influenced by the perceived credibility of the source of that communication.

Fogg (2003a) identified several channels through which credibility can be built and maintained, the most applicable of which is termed *surface credibility*, or credibility that derives from "initial judgments based on surface traits such as a persons' looks, his or her dress, or hairstyle" (p. 132). Given the importance of initial impressions of websites (Everard & Galletta, 2005; Lowry et al., 2008), surface credibility is the primary focus of this research. For brevity, unless stated otherwise, we use the term *credibility* when referring to surface credibility.

Much of the interchange in an online interaction is nonverbal, as it is based on the look and feel, aesthetics, or design of the website (Everard & Galletta, 2005; Faiola, Ho, Tarrant, & MacDorman, 2011; Fogg et al., 2002; Lowry et al., 2008; Robins & Holmes, 2008). Previous SCT research in online settings has leveraged this fact, finding that color schemes and other visual elements predict perceptions of credibility (Fogg et al., 2002; Kensicki, 2003; Robins & Holmes, 2008). However, a largely unexplored area has been on the effect of logo design, another type of visual, nonverbal communication, on credibility creation online. This is a particularly interesting research gap because logos are critical to branding and source credibility, and thus have been subject of a plethora of research in normal retail channels (Henderson & Cote, 1998; Henderson, Cote, Leong, & Schmitt, 2003; Tavassoli & Lee, 2003; van den Bosch, Elving, & de Jong, 2006). Recent exploratory work has been conducted with SCT and logo design in an online context. Logos designed according to traits of credibility (expertise and trustworthiness) were suggested to significantly increase the tendency of site visitors to stay and interact with a website (Haig, 2006, 2008). These preliminary results appear to be promising in terms of SCT and logos online; yet, to date, no one has further developed this line of research.

Namely, we could find no previous research that has applied traits of credibility to the design of website logos, and virtually no researchers have examined the use of logos to trigger credibility judgments of companies on the web. Our research fills these gaps to provide a unique contribution to the literature by leveraging SCT for building credibility using logos. We predict and measure these credibility effects not only in terms of SCT measures but also in terms of trusting and distrusting beliefs.

Going forward, we present a more thorough review of the literature to highlight why the combined application of SCT and logos is such a promising application to websites that few researchers have addressed. We then further discuss our key theory, build our theoretical model, and present our hypotheses. We present our research methodology, analysis, and results, and then conclude with a discussion of our findings, their implications, and directions for future related research.

2. THE PROMISE OF SCT AND LOGOS APPLIED TO WEBSITES

In this section, we further motivate the potential contribution of our research by more deeply explaining why the combination of SCT and logos applied to websites is so promising. We first explain SCT and logo research. We then explain how SCT has been applied in extant website research. Not only has little research been conducted in the combined area of SCT and logos for websites, but a few important issues remain that we address in our research. First, previous work regarding SCT and logos has been exploratory and lacking in methodological rigor. Second, and more compelling, we could find no previous empirical work that establishes perceived credibility of the website sponsor as an antecedent of trusting and distrusting beliefs. We validate this relationship, leveraging SCT and the nonverbal communication inherent in logos to induce positive credibility judgments, which then manifest in trusting beliefs and intentions.

2.1. SCT Applied to Logo Research

Whereas both logos and SCT are prominent in the research literature, we were surprised to learn they are rarely combined in a given study. Numerous studies have adopted SCT as a basis for informing persuasive marketing (Barr & Kellaris, 2000; MacInnis, Rao, & Weiss, 2002; Moorman, Deshpande, & Zaltman, 1993; Scholten, 1996) and reputation building/branding (Chaiken & Maheswaran, 1994; Herbig & Milewicz, 1995). Logos or trademarks have long been considered an important part of corporate branding and visual identity strategies (Cohen, 1986; Dandridge, Mitroff, & Joyce, 1980; Hagtvedt, 2011; Han, Nunes, & Drèze, 2010; Henderson & Cote, 1998; Hoyer & Brown, 1990; Mangelsdorf, 2009; Melewar, 2003; van den Bosch et al., 2006). The use of SCT in the literature on logo design and effectiveness, however, has been quite sparse. Most of the literature on logo design has focused on primary characteristics of "good" logo design—for example, that a logo should evoke positive feelings of familiarity and affinity, be recognizable, and communicate clear meanings (Cohen, 1986; Henderson & Cote, 1998; Hoyer & Brown, 1990).

A few brand design studies have approached the use of SCT as a general principle but not as a direct application of the theory. For example, Hutton (1997), in the context of corporate visual identity, described "conscious associations" and "unconscious associations" (p. 127) encouraging the use of familiar, aesthetically pleasing images or symbols to induce positive feelings toward the firm being represented. Werkmen (1974) stated that trademarks must, among other things, indicate the origin of the company and convey product or company information. Henderson et al. (Henderson & Cote, 1998; Henderson et al., 2003; Henderson, Giese, & Cote, 2004) have done substantial work in the area of logo design. In addition to suggesting several practical traits of logo design (e.g., complexity, symmetry,

etc.), their works have indicated that logos need to communicate likeability and quality to be effective. These elements clearly relate to SCT, but they did not explicitly leverage SCT in their work.

Hagtvedt (2011) recently examined empirically how certain design elements of logos affect individuals' perceptions of the represented firm. He demonstrated that logos with parts of characters intentionally blanked out (termed *incomplete typeface logos*) reduce perceptions of firm trustworthiness. He additionally showed that these incomplete typeface logos increase individuals' perceptions of firm innovativeness. These findings introduce opportunities for further exploration regarding how simple changes to the design of a logo can trigger judgments of characteristics of the firm represented by that logo. Our research expands this notion while using an established theoretical framework to inform logo design choices.

Although these studies have undertones of SCT, a deep review of the literature revealed no previous studies in which SCT was used as a theoretical framework to inform the effective design of logos. The only stream of research targeting this specific use of SCT is a small subset of exploratory research (Haig, 1979, 2006, 2008; Haig & Harper, 1997), on which we build. In (Haig, 2006, 2008), the concept of *credibility-based logo design* is discussed in depth. This design strategy leverages the SCT framework to improve the effectiveness of logo design. Specifically, the researcher proposes the use of the common SCT traits of expertise and trustworthiness in the design of logos, tailored to the characteristics of each firm. Like people, all companies have unique credibility traits. A house painting company, for example, could incorporate the credibility trait of expertise into their logo by using an image indicative of painting knowledge (e.g., a house and a paintbrush). Trustworthy traits such as efficiency, computerized scheduling, and use of the latest paints would be incorporated using a contemporary styling motif. The whole logo then communicates "expertise" and "trust" in a *credibility-based logo design*. However, an old-fashioned candy company would have a candy-related icon with a more dated look, implying longevity, stability, sound experience, and so on. In these examples, the house/paintbrush combination and candy-related logos demonstrate expertise or competence in what the company does; modern efficiency and old-fashioned design styles demonstrate *trustworthiness/believability,* describing the character of the company, which helps customers believe and trust the company.

Credibility-based logo design has been proposed as an effective way to build credibility. The empirical work of (Haig, 2006) preliminarily tested credibility-based logos in an online environment—showing significant gains in user click-through rates when credibility-based logos were used with no other stimuli. The principles used in this previous research lay a foundation for our study, which focuses the notion of credibility-based logo design on building credibility in online marketplaces.

2.2. SCT Applied to Web Research

Whereas SCT has been leveraged regularly in website research, no studies to date have considered the effects of logos on source credibility of websites. Fogg and colleagues (Fogg, 1998, 1999, 2003a; Fogg, Marshall, Kameda, et al., 2001; Fogg, Marshall, Laraki, et al., 2001; Fogg & Tseng, 1999; Tseng & Fogg, 1999) have done extensive work exploring credibility on the web. SCT has also been leveraged in other online contexts, including online journalism (Johnson & Kaye, 2009), online advertising (Chiu, Hsieh, Kao, & Lee, 2007), web design (Flanagin & Metzger, 2007; Hong, 2006; Kensicki, 2003; Robins & Holmes, 2008; Shon, Marshall, & Musen, 2000), and, more generally, credibility in an online context (Eastin, 2001; Ekstrom, Bjornsson, & Nass, 2005; Liu, 2004; Warnick, 2004; Wathen & Jacquelyn, 2002).

In summary, studies that combine SCT with the study of logos have been sparse, preliminary, and largely exploratory (Haig, 1979, 2006, 2008; Haig & Harper, 1997). The application of SCT to the marketing literature has focused more generally on corporate branding, reputation, and visual identity. Studies of credibility on the web have used SCT somewhat sparingly, and none have mentioned building credibility through logo design. Thus, this article fills a substantial gap in the literature by providing the first evidence suggesting that source credibility stimulated by credibility-based logo design can have an important impact in building firm credibility in online contexts. We specifically theorize and empirically support how SCT-based logo design in websites increases credibility and trusting intentions, and decreases distrusting intentions in short-term website interaction. Applied to practice, because logos are often a prominent and key part of the image of a firm, understanding the effects of credibility-based logos could help businesses effectively build credibility online. We also uniquely consider extending principals of SCT-based logo design to the design of the website itself to create a unified, consistent branding image for maximum credibility impact.

3. THEORY AND HYPOTHESES

In this section, we further explain our baseline theory of SCT and our extension of SCT to the context of logo use in websites—along with associated hypotheses that can be empirically tested.

3.1. Source Credibility Theory

In his work to extend the principles of SCT to the online context, Fogg (2003a) specified four different contexts or channels in which credibility can develop: presumed credibility, reputed credibility, experienced credibility, and surface credibility. These contexts for credibility are not mutually exclusive, and one's perception of credibility in one context can evolve into perceived credibility in another context. The first three

contexts are not addressed in the current work.[1] Instead, the fourth—surface credibility—is what our research is built on. *Surface credibility* is "derived from simple inspection . . . [and] making initial judgment[s] based on surface traits such as a person's looks, his or her dress, or hairstyle" (Fogg, 2003a, p. 132). This type of credibility is most applicable to the current study, as website design and logos are nonverbal, visual cues that are quickly assessed by a user—thus constituting surface credibility traits. The effects of credibility-based logo and website design pertain to visual, nonverbal traits that build surface credibility.

In our web-based context, our use of credibility is much more specific than the mere perceived trustworthiness or believability of information found on the Internet (see Robins & Holmes, 2008). Instead, we are ultimately concerned with the firm's judged credibility, as fostered by its website. Thus, because consumers routinely treat websites as surrogates of the underlying companies (Lowry et al., 2008), we posit that the degree to which a consumer interacts with and perceives credibility in a *website* will in turn influence the consumer's perceptions of the credibility of the *firm* represented by the website (P1).

Although P1 sets the foundation for our model, appropriate use of the construct of credibility from a SCT-based perspective requires that credibility be broken into three subdimensions. Hovland and Weiss (1952) were the first to show empirical support indicating that the persuasiveness of a given message is strongly influenced by its source. Their model and corresponding experimentation showed that the same message content communicated by two different sources (one presented as trustworthy, the other presented as untrustworthy) was perceived by participants at significantly different levels of credibility. A pair of studies published thereafter (Berlo et al., 1969; Whitehead, 1968) built on the Hovland and Weiss publication, finding support for the three dimensions that more definitively make up source credibility as conceptualized by SCT, and which we adopt for our study: trustworthiness, expertise, and dynamism.

Trustworthiness is defined by such terms as "safety," "justice," and "honesty" (Berlo et al., 1969, p. 567). The trustworthiness dimension of credibility indicates the perceived integrity or decency of the source. This dimension has been found in multiple studies to be the most influential dimension for people in determining a source's credibility (Berlo et al., 1969; Whitehead, 1968). This is not surprising, given the definition of credibility as a measure of the believability or trustworthiness of a source.

[1] *Presumed credibility* deals with the notion that we believe something is credible because of general assumptions we hold. For example, we might believe that a known brand is better than an unknown brand, or an organized website is more credibility than an unorganized one. *Reputed credibility* is credibility that comes from referencing a third party. For example, a friend says a website is excellent or a website has won an award. *Earned credibility* is credibility that occurs from past experiences with an object or person. For example, a person has past positive experience purchasing goods on a website.

The *expertise* dimension refers to the source perceived as being "trained, experienced, authoritative, skilled, [and] informed" (Berlo et al., 1969, p. 567). This dimension represents the extent to which the receiver perceives the source as having knowledge or skill in the subject area of the message.

A third dimension, *dynamism,* describes the extent to which a source is "fast, energetic . . . bold . . . colorful, and confident" (Berlo et al., 1969, p. 567). This component references the way in which the message is delivered. In a spoken communication context, this is interpreted as charisma or confidence. Dynamism could also be interpreted as how dominantly or clearly expertise and trustworthy traits are communicated in an interaction. Thus, in some contexts, simplicity and consistency in the presentation of credibility traits are also considered dynamism. In an online context, this has been effectively framed as the way in which information is presented (i.e., graphic design; Robins & Holmes, 2008).

Although there is some debate about which factors contribute most to a receiver's perception that a message source is credible (Berlo et al., 1969), researchers generally agree that the two mandatory components of credibility are expertise and trustworthiness (Applbaum & Anatol, 1972; Berlo et al., 1969; Bracken, 2006; Flanagin & Metzger, 2007; Simpson & Kahler, 1980; Whitehead, 1968; Widgery & Stackpole, 1972). However, we also include the dynamism dimension in our model for two key reasons. First, though it is often not included in SCT-based studies, substantial evidence in the literature suggests that dynamism is a significant factor in transmitting credibility during a given communication and thus remains relevant to SCT. Berlo et al. (1969) and Whitehead (1968) showed empirical evidence demonstrating this, and several other researchers have effectively included the dynamism dimension in their models (Applbaum & Anatol, 1972; Bracken, 2006; Robins & Holmes, 2008; Salter, Weider-Hatfield, & Rubin, 1983; Simpson & Kahler, 1980; Widgery & Stackpole, 1972). Thus, although trustworthiness and expertise are the more apparent dimensions of SCT that are more studied than dynamism, dynamism is indeed a key component of SCT even though it is not always used.

Second, dynamism relates to important features of website and logo design. Given that dynamism is essentially a measure of how boldly, simply, or charismatically the source of the message is portrayed, this factor may have a great deal to do with credibility perceptions resulting from the design of logos and the look and feel of a website. Robins and Holmes (2008) investigated how aesthetics of a website can determine the perceived credibility of the site. They effectively used the dynamism portion of credibility as the basis for their argument—stating that dynamism envelopes the nonverbal communication of credibility by designing the site in a professional and appealing manner, thus effectively making the "communication" of credibility simple, bold, and charismatic. Robins and Holmes contended that "aesthetics" and "visual design" created more credibility as an amelioration effect, which "is operational within the first few seconds in which a user views a Web site" (p. 397).

Fogg et al. (2002) also provided evidence regarding the extent to which the dynamism of a website influenced its users' perceptions of credibility. These researchers requested free-response answers from users on what they saw as the most influential factors in convincing them of the credibility (or lack thereof) of the website. The largest categories included "design and look" and "information design" (see Robins & Holmes, 2008). Thus, the way information is presented on a website can have a significant effect on the perceptions of credibility in an online context.

Taken together, these three dimensions provide the basis upon which the receiver makes a decision as to whether to accept the content of the message as credible. The dimensions of trustworthiness and expertise tend to be more influential determinants of perceive source credibility, but dynamism has also been shown to be an important factor, particularly in online contexts.

Although SCT has traditionally and primarily been used to study verbal or written communication, nonverbal cues are also effective in communicating credibility-related information. For example, Burgoon, Birk, and Pfau (1990) find that nonverbal cues such as pitch variety, eye contact, facial pleasantness, and use of illustrator gestures significantly predict perceived credibility of public speakers. Other examples of studies wherein nonverbal cues predict credibility include (Burgoon, Blair, & Strom, 2008; McCroskey & Teven, 1999; Reinhard & Sporer, 2008; Seiter, Weger, Jensen, & Kinzer, 2010; Teven, 2007; Vrij, 1993). These findings are highly relevant to our context since the communication of information via a website is inherently nonverbal. Website characteristics such as layout, aesthetics, graphic design, and so on (i.e., all cues except the written text on the site) are nonverbal, appearance-based cues but have nonetheless been shown to influence perceptions of credibility (Fogg, 1999, 2003a; Robins & Holmes, 2008). We extend this notion specifically to include nonverbal communication of credibility traits through the design of the company logo.

Based on this foundation, we propose that the degree to which a consumer interacts with a *website* and perceives trustworthiness, expertise, and dynamism in the website, the more the consumer will perceive trustworthiness, expertise, and dynamism in the *firm* represented by the website (P2). Operationalization of this proposition as testable hypotheses in our context yields the following hypotheses:

H1a: SCT-based logo design with specific features that invoke trustworthiness—such as consistency, stable shapes, simplicity, contemporariness, and reassuring colors—will increase perceived trustworthiness of a firm represented by its website.

H1b: SCT-based website design specific features that invoke trustworthiness—such as consistency, stable shapes, contemporariness, and reassuring colors—will increase perceived trustworthiness of a firm represented by its website.

H1c: The interaction of using both SCT-based logo design and SCT-based website design to invoke trustworthiness jointly will more powerfully increase perceived trustworthiness of a firm represented by its website than SCT-based logo design or SCT-based website design alone.

H2a: SCT-based logo design with specific features that invoke expertise—such as those representing the firm's core product or service—will increase perceived expertise of a firm represented by its website.

H2b: SCT-based website design specific features that invoke expertise—those representing the firm's core product or service —will increase perceived expertise of a firm represented by its website.

H2c: The interaction of using both SCT-based logo design and SCT-based website design to invoke expertise jointly will more powerfully increase perceived expertise of a firm represented by its website than SCT-based logo design or SCT-based website design alone.

H3a: SCT-based logo design with specific features that invoke dynamism—such as clarity, prominence, and mass—will increase perceived dynamism of a firm represented by its website.

H3b: SCT-based website design specific features that invoke dynamism —such as clarity and an aesthetic design that complements the logo—will increase perceived dynamism of a firm represented by its website.

H3c: The interaction of using both SCT-based logo design and SCT-based website design to invoke dynamism jointly will more powerfully increase perceived dynamism of a firm represented by its website than SCT-based logo design or SCT-based website design alone.

3.2. Source Credibility as a Key Predictor of Trust and Distrust

Having explained our baseline theory, SCT, and the nonverbal cues with which we hope to trigger positive credibility judgments, we now argue that source credibility can be a key antecedent of both trust and distrust. We first briefly explain trust and the debate surrounding its distinctiveness from distrust. We then present and justify our proposed link between source credibility and both trust and distrust, presenting our final research model.

Trust and distrust. *Trust* has been defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau, Sitkin, Burt, & Camerer, 1998, p. 395). McKnight, Cummings, and Chervany (1998), building on the seminal work of Mayer, Davis, and Schoorman (1995), proposed the most commonly accepted theory for initial trust formation. This work was later extended to online trust formation (McKnight, Choudhury, & Kacmar, 2002). McKnight et al.

(2002) defined *trusting beliefs* as a consumer's belief that an online vendor will act with benevolence, integrity, and competence in transactions with the consumer. *Trusting intentions* "means the truster is securely willing to depend, or intends to depend, on the trustee" (McKnight, et al., 2002, p. 337). Thus, for a website user to perform trusting actions, such as give personal information and/or make purchases, he or she must be willing to accept vulnerability and take a risk to trust and depend on the firm sponsoring the website. Given this background, we predict the following hypotheses:

H4a: A disposition to trust will increase trusting beliefs (formed from benevolence, integrity, competence, and trusting stance).
H5a: An increase in trusting beliefs will increase trusting intentions (formed from willingness to depend, follow advice, give information, and make purchases).

The relationship between trust and distrust is under debate by academics from multiple disciplines. Recent literature supports the notion that trust and distrust are separate constructs (Komiak & Benbasat, 2008; Lewicki, McAllister, & Bies, 1998; McKnight, Kacmar, & Choudhury, 2004). Conversely, scholars in psychology and other disciplines often regard trust and distrust as opposites on the same continuum (Rotter, 1971; Schul, Mayo, & Burnstein, 2008; Stack, 1978). Interesting recent neural research (Dimoka, 2010) indicates that trust and distrust activate different areas of the brain. To be consistent with many recent insights from these studies, we treat trust and distrust as separate constructs, and, following the extensions of McKnight et al. (2004) and McKnight and Choudhury (2006), predicted the following:

H4b: A disposition to trust will decrease distrusting beliefs.
H5b: An increase in distrusting beliefs will decrease trusting intentions.
H6a: A disposition to distrust will increase distrusting beliefs.
H6b: A disposition to distrust will decrease trusting beliefs.

Our expanded model factoring in distrust is shown in Figure 1.

Trust and source credibility. Trust and source credibility are related but distinct concepts, treated differently in the literature (Everard & Galletta, 2005), and operationalized separately in our article. We have established SCT (Hovland & Weiss, 1952) as a useful theory in predicting the extent to which a particular communication is persuasive and that the persuasiveness of a message is heavily influenced by the traits of credibility that the receiver judges in the source. The current work frames the website itself as the message being communicated. The source of the message is the firm sponsoring the website, the receiver of the message is the Internet user, and the desired outcome of the firm (i.e., the intended persuasion) is that the user maintains trusting beliefs in the website, and eventually intends to use the site (i.e., has trusting intentions). Thus, trustworthiness, expertise, and dynamism are judged attributes of the message source, as induced by the characteristics of the website (and, specifically in our case, the logo), and these judged attributes then help determine whether the judger (i.e., Internet user), will take a risk and trust the source. This logic gels with previous literature (Everard & Galletta, 2005).

Framed in this way, when a firm sponsoring a website is successful in engendering the desired source credibility attributes—in this case through *surface* credibility (Fogg, 2003a)—the user's willingness to accept vulnerability manifests as positive trusting beliefs about the firm, which eventually

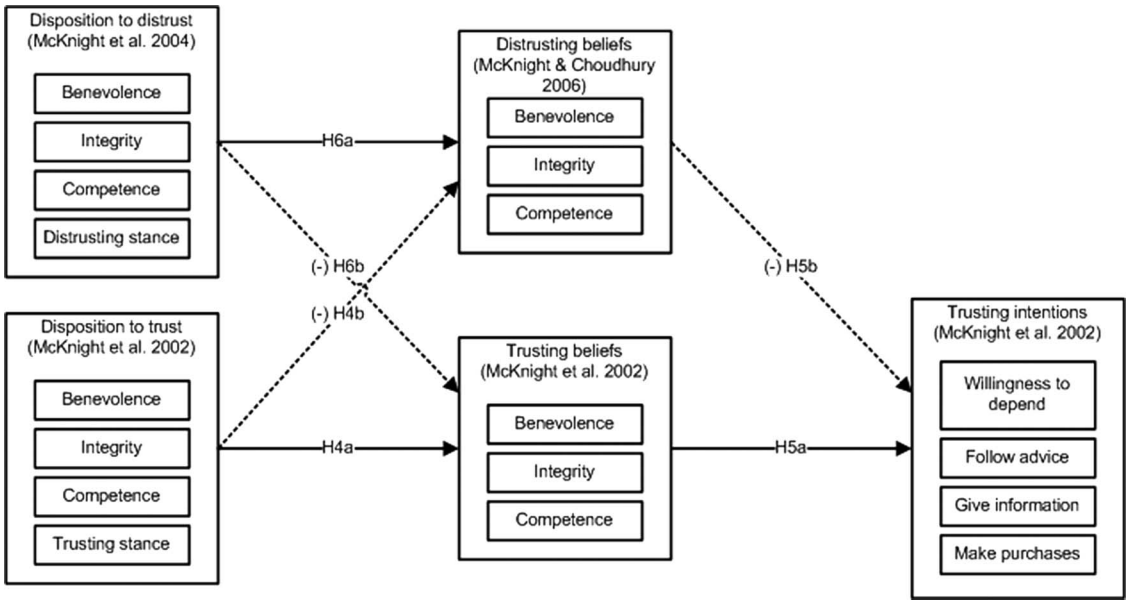

FIG. 1. Initial trust and distrust model.

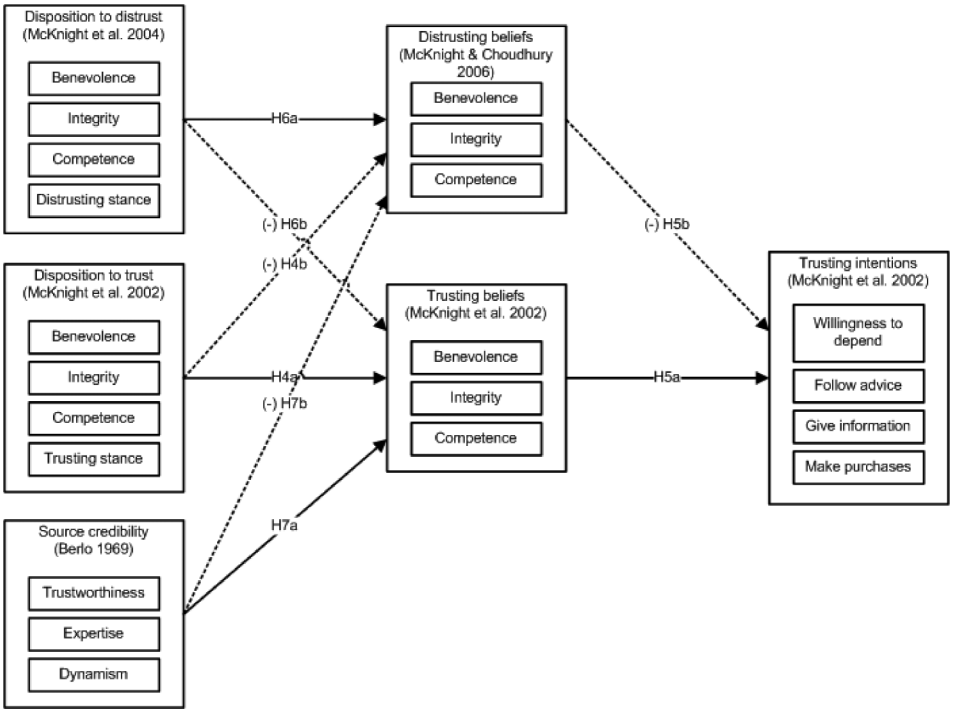

FIG. 2. Final expanded model: The trust-distrust-credibility model.

lead to trusting intentions. In addition, the user's distrusting beliefs should be reduced. Accordingly, we add our key extension to the model, and predict the following:

H7a: An increase in perceived source credibility will increase trusting beliefs.
H7b: An increase in perceived source credibility will decrease distrusting beliefs.

Our final expanded research model is depicted in Figure 2.

4. METHOD

4.1. Design

This study involved three factors in a 2 × 2 × 5 design: (a) website credibility design (high credibility/low credibility); (b) logo credibility design (high credibility/low credibility); (c) to enhance realism, five different website themes were used, each with four different conditions of credibility for a total of 20 possible scenarios. Each participant evaluated screenshots of two different randomized scenarios independent of each other, for 8 s each. The short evaluation period was used to replicate actual browsing habits of web users, who typically spend a very short time at a given website (Peracchio & Luna, 2006). All scenarios were truly randomized thus the design was not perfectly balanced. The number of respondents who received each of the 20 scenarios is summarized in Table 1.

4.2. Data Collection Approach and Participants

We hired a market research firm to conduct the study with an external panel of 220 professionals who were working professionally full-time in the United States. The sample was 49.8% male and 50.2% female; 100% of the respondents held full-time positions. The average age of respondents was 48.3 years ($SD = 13.2$ years), and average full-time work experience was 22.5 years ($SD = 13.3$ years). Most participants provided independent evaluations of two different, randomized websites, for a total of 429 data observations.

External panels have been used effectively in behavioral research fields to elicit responses to survey instruments (Awad & Ragowsky, 2008; Bennett & Robinson, 2000; Gibney, Zagenczyk, & Masters, 2009; Posey, Lowry, Roberts, & Ellis, 2010). This approach to data collection offers several advantages—other than the obvious one of avoiding student data. First, panels allow anonymity to be guaranteed for the respondent—a necessary element in eliciting honest responses to behaviors potentially influenced by social desirability beliefs (Bennett & Robinson, 2000). Second, respondents from a wide range of industries and positions can be reached for topics requiring the participation of a broad spectrum of individuals that would be almost impossible to attain by traditional methods.

4.3. Procedures

To design the logos and accompanying websites used in the study, one author planned and verbalized desired credibility

TABLE 1
Distribution of the Number of Respondents for Each of the 20 Scenarios

Website Name	Website Purpose (Industry)	No. of Responses				
		High Web, High Logo	High Web, Low Logo	Low Web, Low Logo	Low Web, Low Logo	Website Total
Premiere EMS	EMS services (health care)	25	17	24	24	90
Housen Painting	House painting (construction)	17	25	21	18	81
Climber's Rock	Rock climbing (recreation)	24	29	22	15	90
Montpac outsourcing	Outsourcing and consulting services (consulting)	20	24	20	22	86
Next level trading capital	Stock trading (financial)	19	23	18	22	82
Treatment total		105	118	105	101	429

traits for several companies with each firm's owner. Then three professional logo designers who had extensive international experience creating credibility-based logos were engaged to translate the verbalized credibility traits into nonverbal design forms. The designers created not only the logos for our study but also extended website home pages that emulated the credibility-based logos' design, thereby maintaining consistency and clarity of presentation, which partially operationalized dynamism in our context. All companies, websites, and logo names were real, but we chose small, regional firms that were largely unknown to reduce prior respondent familiarity. All artifacts were from actual credibility-based logo and website design work of each of our professional designers.

These credibility-based logo and website designs served as the high-credibility logo and site manipulations, respectively. High-credibility logos and their accompanying websites were designed with the following credibility traits: consistency with the credibility-based site design (trustworthiness; Berlo et al., 1969; Giffin, 1967), contemporary styling (trustworthiness, expertise), stable shapes (e.g., squares, circles; trustworthiness, dynamism; Gatto, Porter, & Selleck, 1999; Tersiiska, 2011), reassuring and congruous color schemes (trustworthiness; Bottomley & Doyle, 2006; Hynes, 2010; Jacobs, Keown, Worthley, & Kyung-II, 1991), with design forms indicative of the firm's core product or service (expertise), and with simplicity and clarity of presentation (dynamism; Fogg, 2003a, 2003b; Fogg et al., 2002). The low-credibility logo conditions consisted of professionally produced stock logos that were related to the purpose of the website but that were not designed according to credibility principals. The low-credibility website conditions were created using a basic website that used the same text as the credibility-based websites but lacked the credibility-based design features.

Before running the professional version of our study, we had the professional designers create 10 different websites that had four combinations each. We then pilot tested the websites with 40 students to find the most effective manipulations, resolve any errors, and find which website combinations would provide the most variety of possible website purposes. We selected five of 10 websites the final experiment. Table 2 provides explicit example detail on how each of our manipulations were designed carefully to invoke their particular target level of credibility, along with practice explanations and supporting research citations. This table does so for the all the Climber's Rock website scenarios; all other manipulations followed exactly the same logic and principles. To supplement this table, Figures 3 to 6 depict the actual screens that were used for all the Climber's Rock manipulations (Scenarios 5–8). As further illustration, we provide the high credibility website and logo manipulations for the other company websites in Figures 7 to 10. The other screenshot manipulations followed the same approach as Climber's Rock. Again, for increased realism, the low credibility logos were chosen from logos found online, which allows us to demonstrate what happens when logos are improperly designed for credibility.

In the final experiment, we first asked participants to fill out the demographic information and all of the dispositional measures (e.g., disposition to trust/distrust). They then received two separate, randomized scenarios, along with the corresponding postexperiment questions. To focus on the cue-related aspects of surface credibility, participants were shown their randomized websites only for a few seconds, and then were asked to answer the postexperiment questionnaire. Once given the questionnaire, they were not allowed to reexamine the given website. This increased the likelihood that their decisions were based on cues and first impressions (as influenced by surface credibility), as opposed to deep, systematic cognitive processing.

4.4. Measures

Measures were carefully selected that properly represent that constructs we tested in this study. All were highly established in the literature and based on initial impressions of trust, distrust, and source credibility. These include disposition to trust

TABLE 2
Explicit Detail on Credibility Manipulations for Climber's Rock

General Credibility Manipulations	Detailed Manipulations (H = high, L = low)	Credibility Trait Objectives to Visually Communicate in the Logo and Site Design	Specific Design Features(s) Used to Invoke the Credibility Traits	Justification for Why These Design Feature(S) Invoke Intended Credibility Traits
Web: high credibility logo: high credibility	1.1 Site trust (H)	Trustworthy in fun, quality, and safe/secure.	Overall layout elements of *quality* and *contemporary*. Use of *brown* and *brown/orange* colors. Photos of *rock climbing*. The site layout follows and complements credibility traits of the credibility-based logo for consistency and higher concentration of credibility traits.	Site layout and design are consistent with the company logo, which overall *consistency* induces perceptions of trust (SCT 18 Consistent: Inconsistent) (Berlo et al., 1969; Giffin, 1967) and has been shown to positively affect perceptions of the company on the web (Cappiello, Francalanci, & Pernici, 2003; Loiacono, Watson, & Goodhue, 2007; Steinfield, Bouwman, & Adelaar, 2002). The contemporary style communicates forward thinking image traits of *unique/different* and helps induce perceptions of reliability. Square lines in the layout symbolize *stability* and *longevity* (Logo Design Team, 2011; Taylor, 2011). *Square* shapes also have *mass or higher quantity of aggregate visual stimuli* (Gatto et al., 1999; Tersiiska, 2011). Layout and climbing photos communicate images of *fun* or *friendliness*. Earth tones communicate warmth, homeliness, and reliability (Hynes, 2010).
	1.2 Site expertise (H)	Expertise in rock climbing wall for workouts.	Overall layout and design denotes company business *expertise* in *rock climbing wall for workouts*.	Photos depict *rock climbing wall for workouts* which is the company business and *expertise*. Color scheme in earth tones is congruent with product offering (Bottomley & Doyle, 2006; Henderson & Cote, 1998) and communicates knowledge of rocks or outdoors.
	1.3 Site dynamism (H)	Simple communication of planned *trustworthy* and *expertise* traits.	Overall layout is *simple, high impact*, and *consistent* from company logo design.	The site layout and high impact photos project the credibility traits with *clarity* and *simplicity,* important features of dynamism in offline settings (Berlo et al., 1969). Use of logo in upper left hand side of the site is *prominent* and placed on the most familiar position on the page (Fogg, 2003b; Fogg et al., 2002). Aesthetic, complementary color scheme and design aid in clear credibility communication (Robins & Holmes, 2008).

(*Continued*)

TABLE 2
(Continued)

General Credibility Manipulations	Detailed Manipulations (H = high, L = low)	Credibility Trait Objectives to Visually Communicate in the Logo and Site Design	Specific Design Features(s) Used to Invoke the Credibility Traits	Justification for Why These Design Feature(S) Invoke Intended Credibility Traits
	1.4 Logo trust (H)	Trustworthy in fun, quality, and safe/secure.	Design elements form overtones of *contemporary* and *whimsical*. Use of earthy tones. Words in strong, capital letter font. The site layout follows and complements credibility traits of the credibility-based logo for consistency and higher concentration of credibility traits.	Site layout and design are consistent with the company logo, which overall *consistency* induces perceptions of trust (SCT 18 Consistent: Inconsistent) (Berlo et al., 1969; Giffin, 1967). Harmonious, simple logos are more reassuring (Henderson, et al., 2004). The *whimsical* lipstick strokes which make up the form communicate an image of *fun* or *friendly. Safe* and *secure* is communicated in a simple name font of strong all capital letters (Henderson et al., 2004). Earth tones communicate warmth, homeliness, and reliability (Hynes, 2010).
	1.6 Logo dynamism (H)	High impact and simple communication of planned *expertise* and *trustworthy* traits.	Design is *simple* and high impact, communicating only desired credibility traits.	Design form is a *unique* and *differen*t visual depiction of *rock-climbing wall for workouts*.
Web: high credibility, logo: low credibility	2.1 Site trust (H)	Same as 1.1	Same as 1.1	Same as 1.1
	2.2 Site expertise (H)	Same as 1.2	Same as 1.2	Same as 1.2
	2.3 Site dynamism (H)	Same as 1.3	Same as 1.3	Same as 1.3
	2.4 Logo trust (L)	None	Not a design form of *trustworthy* traits *quality,* or *safe/secure.* Poor quality design used to reduce professionalism and quality perceptions.	Logo designed to look low quality and cheap, which reduces positive perceptions of the company (Griffith, Krampf, & Palmer, 2001; Loiacono, et al., 2007). Logo coloring and style are inconsistent with the site layout and design, which inconsistency reduces perceptions of trust (Berlo et al., 1969; Giffin, 1967) and negatively affects the sponsoring organization (Cappiello, et al., 2003; Loiacono et al., 2007; Steinfield et al., 2002).

	2.5 Logo expertise (L)	None	Not designed to induce perceptions of expertise. Poor quality design used to reduce professionalism and quality perceptions.	Logo design is amateurish and unprofessional, denoting lack of expertise in rock climbing. A mountain with climber (which still contributes to company *expertise*) is used to maintain construct validity (avoiding a novel treatment bias).
	2.6 Logo dynamism (L)	None	Not a design form that is *unique* or which clearly communicates *trustworthy* and *expertise* traits.	Design is purposefully ambiguous, designed to be devoid of nonverbal credibility communication. The ambiguity reduces the clarity of presentation of possible credibility traits, which affects dynamism (Berlo et al., 1969).
Web: low credibility logo: high credibility	3.1 Site trust (L)	None	Designed as a simple verbal description of company.	Void of any *trustworthy* visual traits.
	3.2 Site expertise (L)	None	Designed as a simple verbal description of company.	Void of any *expertise* visual traits.
	3.3 Site dynamism (L)	None	Designed as a simple verbal description of company.	No communication of credibility traits, so dynamism is not applicable.
	3.4 Logo trust (H)	Same as 2.4	Same as 2.4	Same as 2.4
	3.5 Logo expertise (H)	Same as 2.5	Same as 2.5	Same as 2.5
	3.6 Logo dynamism (H)	Same as 2.6	Same as 2.6	Same as 2.6
Web: low credibility, logo: low credibility	4.1 Site trust (L)	Same as 3.1	Same as 3.1	Same as 3.1
	4.2 Site expertise (L)	Same as 3.2	Same as 3.2	Same as 3.2
	4.3 Site dynamism (L)	Same as 3.3	Same as 3.3	Same as 3.3
	4.4 Logo trust (L)	Same as 2.4	Same as 2.4	Same as 2.4
	4.5 Logo expertise (L)	Same as 2.5	Same as 2.5	Same as 2.5
	4.6 Logo dynamism (L)	Same as 2.6	Same as 2.6	Same as 2.6

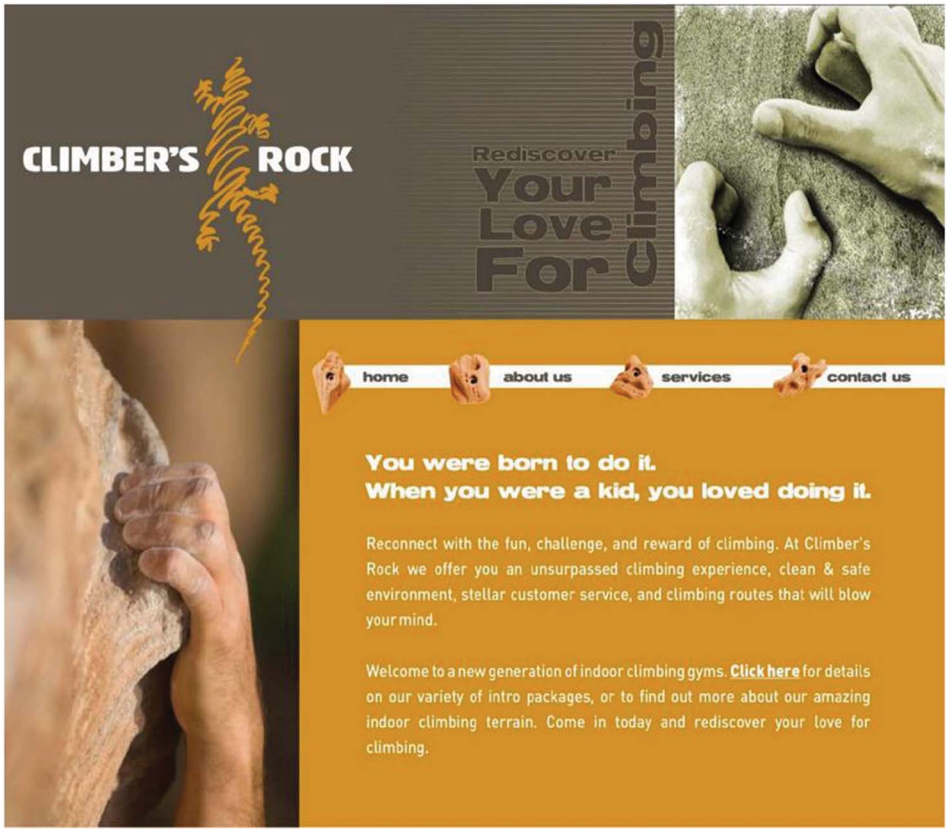

FIG. 3. Climber's Rock high credibility website; high credibility logo (color figure available online).

(McKnight et al., 2002), disposition to distrust (McKnight et al., 2004), trusting beliefs (McKnight et al., 2002), distrusting beliefs (McKnight & Choudhury, 2006), trusting intentions (McKnight et al., 2002), and source credibility, adapted from Berlo et al. (1969). See Table 3 for further details.

5. ANALYSIS

We first conducted extensive preanalysis and data validation according to the latest standards for five purposes: (a) to determine if the constructs are formative or reflective; (b) to establish the factorial validity of the measures through convergent and discriminant validity; (c) to establish that multicollinearity was not a problem with any of the measures; (d) to check for common-methods bias, as established in Liang, Saraf, Hu, and Xue (2007); and (e) to establish strong reliabilities. Because of space limitations, the details of these analyses are available in the online Appendix A, which is also available from the authors on request. Except where noted otherwise, all analysis was conducted using partial least squares (PLS) regression, using SmartPLS version 2.0 (Ringle, Wende, & Will, 2005) for model analysis because PLS is especially adept at validation of mixed models of formative and reflective indicators (Chin, Marcolin, & Newsted, 1996, 2003; Gefen & Straub, 2005). Table 4 summarizes our measurement model statistics. The computed reliability values are summarized in Table 5 and indicate strong reliabilities.

5.1. Manipulation Checks and Interaction Checks

To establish the correctness of our design and to test our first three hypotheses, we then checked the manipulations and performed interaction analysis. To do so, we first tested the basic 2 × 2 design of website credibility design (high/low) and logo credibility design (high/low)—specifically in terms of the subconstructs of credibility of trustworthiness, expertise, and dynamism. The means and standard deviations for the main-effect manipulations are summarized in Table 6. We used a multivariate analysis of variance to test the means of the main effects. All of the main effects were significant and in the expected direction: For the *logo* manipulation, *trustworthiness* was significant at $F(1, 427) = 10.47$, $p = .001$ (H1a supported); *expertise* was significant at $F(1, 427) = 11.29$, $p = .001$ (H2a supported; Cohen's $d = 0.32$ for a small effect); and *dynamism* was significant at $F(1, 427) = 12.55$, $p < .000$ (H3a supported; Cohen's $d = 0.35$ for a small effect). For the *website* manipulation, *trustworthiness* was significant at $F(1, 427) = 5.20$, $p = .023$ (H1b supported; Cohen's $d = 0.22$ for a small effect); *expertise* was significant at $F(1, 427) = 8.81$, $p = .003$ (H2b supported; Cohen's $d = 0.29$ for a small effect); and *dynamism*

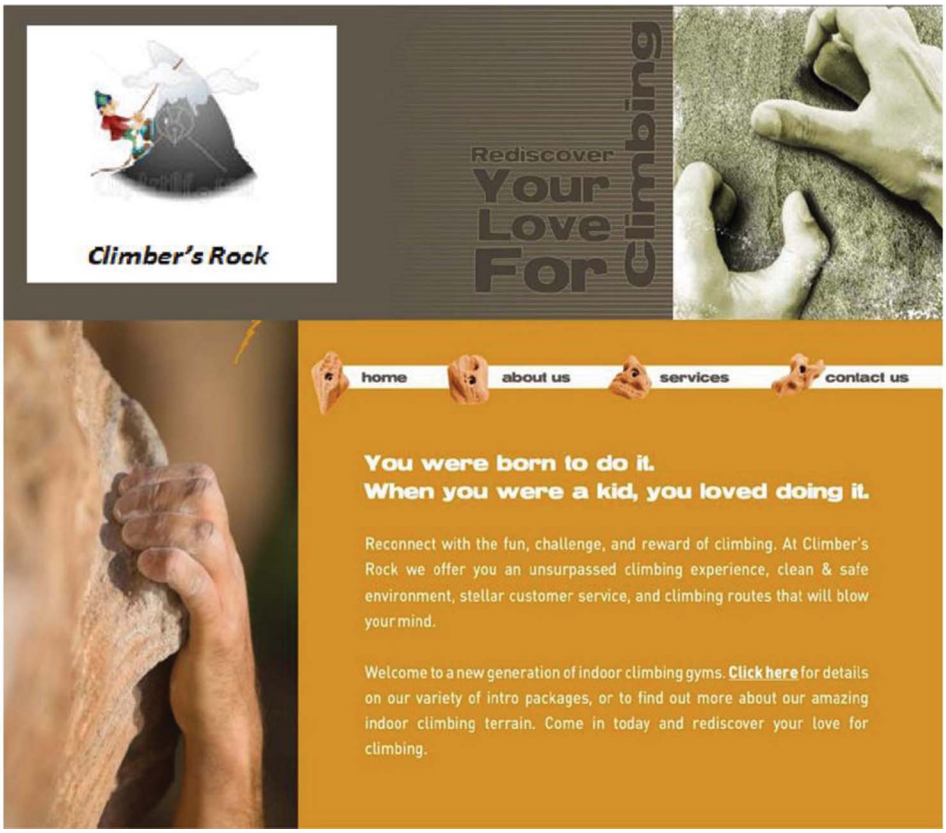

FIG. 4. Climber's Rock high credibility website; low credibility logo (color figure available online).

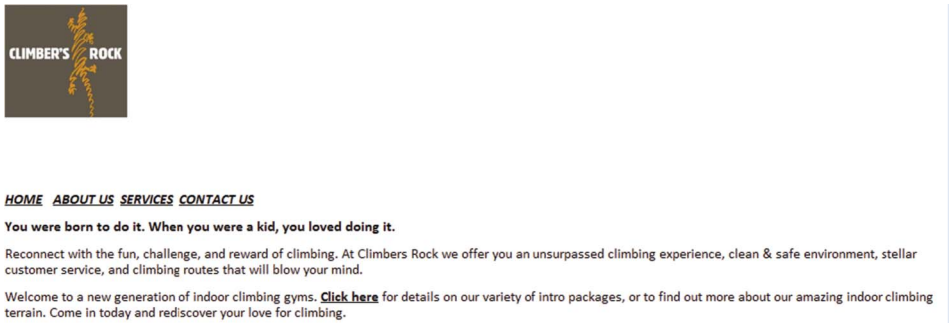

FIG. 5. Climber's Rock low credibility website; high credibility logo (color figure available online).

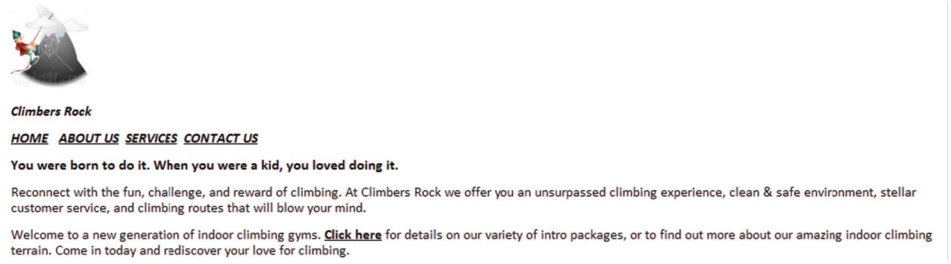

FIG. 6. Climber's Rock low credibility website; low credibility logo (color figure available online).

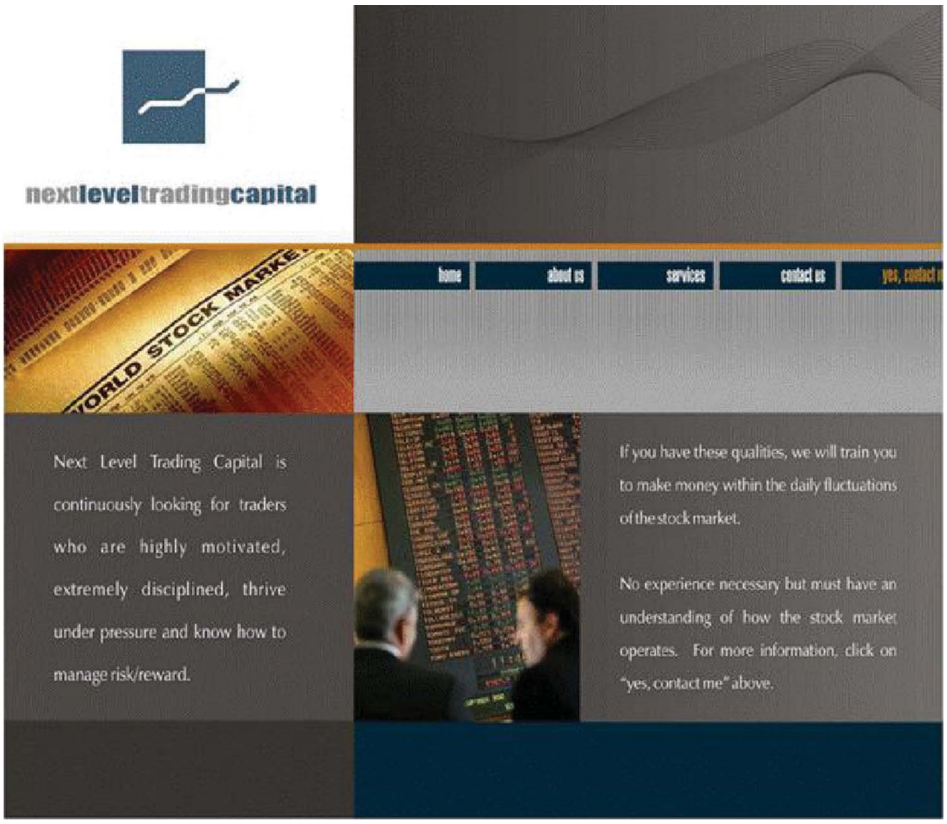

FIG. 7. Next Level high credibility website; high credibility logo (color figure available online).

FIG. 8. Housen Painting high credibility website; high credibility logo (color figure available online).

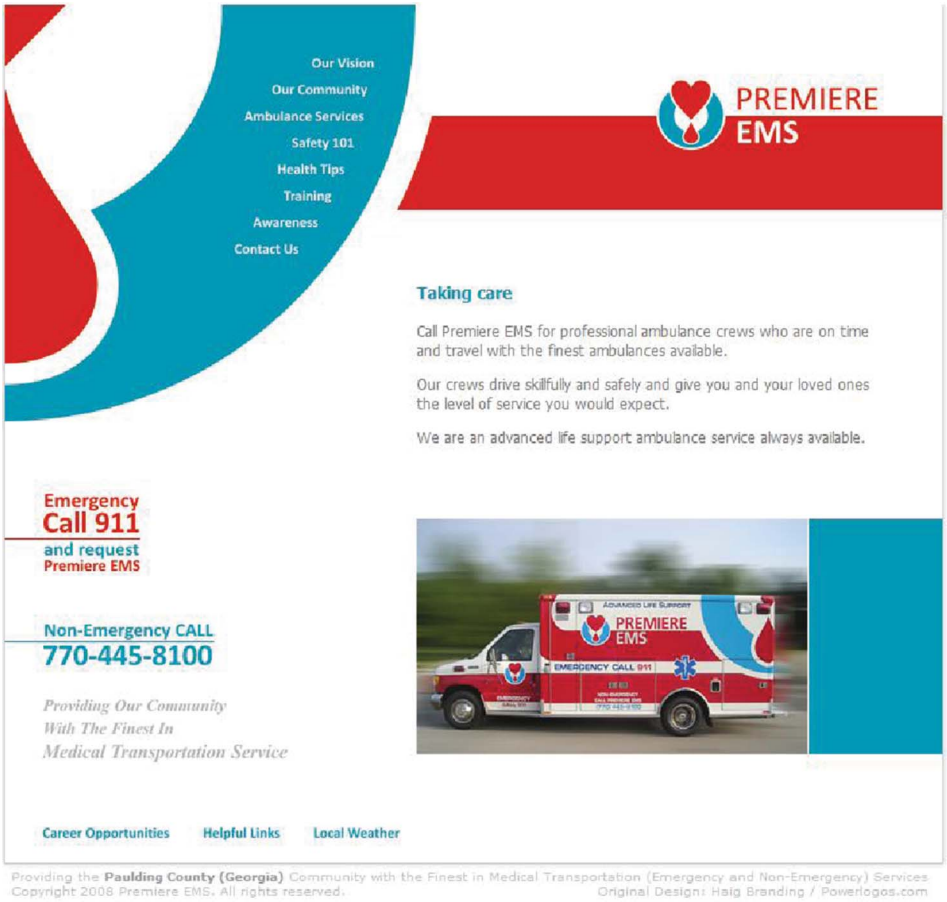

FIG. 9. Premiere EMS high credibility website; high credibility logo (color figure available online).

was significant at $F(1, 427) = 17.51$, $p < .000$ (H3b supported; Cohen's $d = 0.41$ for a medium effect).

We also tested the combined interaction effects of the two factors for the three dependent variables. To do this, we used a multivariate analysis of variance to test the means of all four interaction combinations, summarized in Table 7.

The interactions for dynamism, expertise, and trustworthiness are depicted further in Figures 11, 12, and 13, respectively. The overall F statistics were significant for each dependent variable: *trustworthiness* was significant at $F(3, 427) = 5.17$, $p = .002$; *expertise* was significant at $F(3, 427) = 10.80$, $p < .000$; *dynamism* was significant at $F(3, 427) = 6.52$, $p < .000$. We ran a post hoc Tukey's Honestly Significant Difference test to determine which means were significantly higher and lower than the others, the results of which are summarized in Table 8. For every dependent variable, as predicted, the combined use of high-credibility logos and high-credibility websites created statistically higher results than either treatment alone. Hence H1c (trustworthiness), H2c (expertise), and H3c (dynamism) were supported.

5.2. Final Analysis and Results

We used PLS regression, using SmartPLS version 2.0 (Ringle et al., 2005) for model analysis because PLS is especially adept at validation of mixed models of formative and reflective indicators (Chin et al., 1996; Chin et al., 2003; Gefen & Straub, 2005). To do so, we generated a bootstrap with 500 resamples. Table 9 summarizes the hypotheses, path coefficients, and p values for the hypotheses. Figure 14 depicts our tested model.

6. DISCUSSION

Websites are often the first point of contact between a company and its customers. Accordingly, companies go to great lengths to ensure that a user's initial experience with a website is positive and inviting. Consumer research suggests, however, that a large majority of online users tend to give a website only a few seconds of attention before continuing to the next site (Peracchio & Luna, 2006) and are unlikely to browse very deeply within the site (Thompson, 2004). Accordingly, users make very swift judgments about whether to transact with a

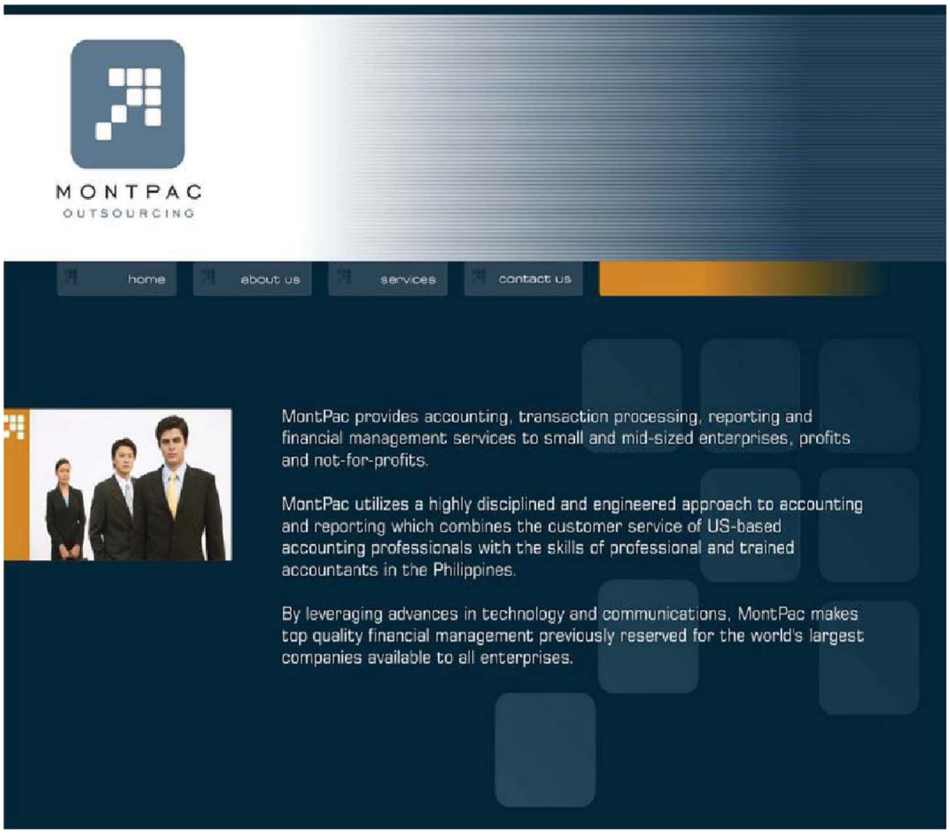

FIG. 10. MontPac high credibility website; high credibility logo (color figure available online).

given website, and companies must capitalize on those first few seconds of interaction.

Our research provides evidence that companies can embed traits of credibility in the design of a logo and that these logos can trigger positive credibility assessments of the sponsor of the website. This perception of credibility positively influences users' trust and downstream behavior. This logo design approach, which we term *credibility-based logo design*, is a novel approach to helping a company communicate credibility via its website. Moreover, as visual, nonverbal design elements, logos can be quickly assessed and comprehended. Thus, given the compelling empirical results of our research, logos could become an important method for companies to capture users' attention and trust within the first few seconds of an online interaction.

Nearly all of our hypotheses received empirical support. The hypotheses taken from the McKnight et al. (2002) trust model (H4a and H5a) were both significant at the .01 level. The addition of the separate distrust constructs to the model received partial support. Distrusting beliefs significantly reduced trusting intentions (H5b) and disposition to distrust adequately predicted distrusting beliefs (H6a). Both the relationship between disposition to trust and distrusting beliefs, and between disposition to distrust and trusting beliefs, received no statistical support. The lack of support for two of the hypotheses regarding the trust/distrust relationship underscores the unclear nature of the current debate on the subject. Most notably, however, is the strong support found for source credibility as an important predictor of both trusting and distrusting beliefs (H7a and H7b). Credibility was found to be a key underlying factor in a user's tendency to trust in an online transaction. Figure 15 depicts our final proposed model.

Our manipulation-check results show that our design was effective in creating the manipulations we intended to create. They also show that the use of credibility-based logos or credibility-based website designs alone increase perceived credibility—specifically in terms of trustworthiness, expertise, and dynamism. The interaction analysis indicates that these main effects are additive in their interactions. Namely, using a combination of credibility-based logos and credibility-based website designs provides stronger credibility results than using either one alone (H1c, H2c, and H3c).

6.1. Contributions to Research and Practice

Our findings provide several important contributions to both research and practice. First, though empirically validating the highly cited McKnight trust model (McKnight et al., 2002) does not represent any considerable contribution, our results regarding the distinct nature of the two debated constructs—trust and

TABLE 3
Measurement Details

Construct	Subconstruct	Item Code	Lead Questions and Item Scales	Citation
Disposition to trust	DT-Benevolence (DTB)	DTB1	In general, people really do care about the wellbeing of others.	(McKnight, et al., 2002)
		DTB2*	The typical person is sincerely concerned about the problems of others.	
		DTB3	Most of the time, people care enough to try to be helpful, rather than just looking out for themselves.	
	DT-Integrity (DTI)	DTI1	In general, most folks keep their promises.	
		DTI2	I think people generally try to back up their words with their actions.	
		DTI3	Most people are honest in their dealings with others.	
	DT-Competence (DTC)	DTC1	I believe that most professional people do a very good job at their work.	
		DTC2	Most professionals are very knowledgeable in their chosen field.	
		DTC3*	A large majority of professional people are competent in their area of expertise	
	DT-Trusting stance (DTTS)	DTTS1	I usually trust people until they give me a reason to doubt when I first meet them.	
		DTTS2	I generally give people the benefit of the doubt when I first meet them.	
		DTTS3	My typical approach is to trust new acquaintances until they prove I should not trust them.	
Disposition to distrust	Suspicion of humanity-Benevolence	DDSOHB1	I worry that people are usually out for their own good.	(McKnight, et al., 2004)
		DDSOHB2	It concerns me a lot that people pretend to care more about one another than they really do.	
		DDSOHB3	I fear that most people inwardly dislike putting themselves out to help other people.	
	Suspicion of humanity-Integrity (DDSOHI)	DDSOHI1	Unfortunately, most people would tell a lie if they could gain by it.	
		DDSOHI2	It's a troubling fact that people don't always hold to the standard of honesty they claim.	
		DDSOHI3	Sadly, most people would cheat on their income tax if they thought they could get away with it.	
	Suspicion of humanity-competence	DDSOHC1*	I get uncomfortable because many professionals are not as knowledgeable in their field as you would expect.	

(*Continued*)

TABLE 3
(Continued)

Construct	Subconstruct	Item Code	Lead Questions and Item Scales	Citation
		DDSOHC2	I am nervous that most professionals do a haphazard job at what they do.	
		DDSOHC3	Concern is justified, since many professionals are not really competent in their area of expertise.	
	Distrusting stance (DDDSTA)	DDDSTA1	I'm usually cautious about relying on people when I first work with them.	
		DDDSTA2	When I first meet people, I tend to watch their actions closely.	
		DDDSTA3	I typically have suspicious feelings towards new acquaintances until they prove to me that I can trust them.	
		DDDSTA4	I am hesitant to trust people until after I have proven them.	
Trusting beliefs	TB-Benevolence (TBB)	TBB1	I believe that the company would act in my best interest.	(McKnight, et al., 2002)
		TBB2	If I required help, the company would do its best to help me.	
		TBB3	The company would be interested in my wellbeing, not just their own.	
	TB-Integrity (TBI)	TBI1*	The company would be truthful in its dealings with me.	
		TBI2*	I would characterize the company as honest.	
		TBI3*	The company would keep its commitments.	
		TBI4	The company is sincere and genuine.	
	TB-Competence (TBC)	TBC1	The company is competent and effective in providing its products or services.	
		TBC2*	The company performs its role of providing its products and services very well.	
		TBC3	Overall, the company is capable and proficient in providing its products and services.	
		TBC4*	In general, the company is very knowledgeable about its products and services.	
Distrusting beliefs	DB-Benevolence (DBB)	DBB1*	I am not sure that the company would act in my best interest.	(McKnight & Choudhury, 2006)
		DBB2	If I required help, I would feel apprehensive about whether the company would do its best to help me.	
		DBB3	I suspect that the employees of the company are interested in just their own well-being, not in my well-being.	

	DB-Integrity (DBI)	DBI1	I would be worried about whether the company would be truthful in its dealings with me.	
		DBI2	I would feel cautious about characterizing the company as honest.	
		DBI3	It is uncertain whether the company would keep its commitments.	
		DBI4	I would be uneasy about whether the company is sincere and genuine.	
Trusting intentions	TI-Willingness to depend (GN)	TIGN1*	When an important related opportunity arises, I would feel comfortable depending on the information provided by this website.	(McKnight, et al., 2002)
		TIGN2	I could always rely on this website in a tough situation.	
		TIGN3	I feel that I could count on this website to help with a crucial problem.	
		TIGN4	Faced with a difficult situation that required me to change plans, I would use this website.	
	TI-Subjective probability of depending—Follow advice (FA)	TIFA1*	If I had a challenging problem, I would want to use this website.	
		TIFA2*	I would feel comfortable acting on the information given to me by this website.	
		TIFA3	I would not hesitate to use the information this website supplied me.	
		TIFA4	I would confidently act on the advice I was given by this website.	
		TIFA5	I would feel secure in using the information from this website.	
		TIFA6	Based on the information I just read, I would follow the advice given me by this website.	
	TI-Subjective probability of depending—Make purchases (MP)		Suppose that the website was not free, but charged to access information on the site. Answer the following questions:	
		TIMP1	Faced with a difficult situation, I would be willing to pay to access information on this website.	
		TIMP2	I would be willing to provide my credit card information on this website.	
		TIMP3	Given a difficult situation, I would be willing to pay for a 30-minute phone consultation with an employee of the company.	
Source credibility	SC-Trustworthiness (SCT)		Which attributes would you ascribe to the company represented by the site?	(Berlo et al., 1969)
		SCT1	Safe:Dangerous	
		SCT2	Just:Unjust	

(*Continued*)

TABLE 3
(Continued)

Construct	Subconstruct	Item Code	Lead Questions and Item Scales	Citation
		SCT3	Honest:Dishonest	
		SCT4	Reasonable:Unreasonable	
		SCT5(m)	Trustworthy:Untrustworthy	
		SCT6	Good:Bad	
		SCT7	Sympathetic:Unsympathetic	
		SCT8	Stable:Unstable	
		SCT9	Kind:Cruel	
		SCT10	Rational:Irrational	
		SCT11(m)	Reliable:Unreliable	
		SCT12	Reputable:Disreputable	
		SCT13(m)	Dependable:Undependable	
		SCT14	Friendly:Unfriendly	
		SCT15	Sensible:Not Sensible	
		SCT16	Responsible:Irresponsible	
		SCT17	Consistent:Inconsistent	
	SC-Expertise (SCE)	SCE1	Trained:Untrained	
		SCE2	Experienced:Inexperienced	
		SCE3*	Authoritative:Unauthoritative	
		SCE4(m)	Skilled:Unskilled	
		SCE5	Informed:Uninformed	
		SCE6(m)	Competent:Incompetent	
		SCE7(m)	Knowledgeable:Unknowledgeable	
		SCE8	Capable:Incapable	
		SCE9*	Successful:Unsuccessful	
		SCE10*	Effective:Ineffective	
		SCE11*	Efficient:Inefficient	
		SCE12*	Strong:Weak	
		SCE13*	Orderly:Disorderly	
	SC-Dynamism (SCD)	SCD1	Fast-Slow	
		SCD2	Bold-Timid	
		SCD3	Active-Passive	
		SCD4	Aggressive-Meek	
		SCD5	Decisive-Inconclusive	
		SCD6	Confident-Unsure	

Note. (m) = dropped to decrease multicollinearity; all source credibility items were reverse-coded to be in the positive direction to be consistent with the rest of the mode.
*Dropped to improve convergent and discriminant validity.

TABLE 4
Measurement Model and Discriminant Validity of Reflective Subconstructs Using Average Variance Extracted (AVE)

Item	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. DT_tb	4.71	1.07	.885																				
2. DT_dti	4.52	1.08	.582	.859																			
3. DT_dtc	5.11	1.01	.266	.501	.917																		
4. DT_dtts	5.54	1.05	.388	.349	.298	.883																	
5. DD_ben	4.22	1.24	−.307	−.365	−.127	−.217	.837																
6. DD_int	4.88	1.27	−.260	−.463	−.258	−.159	.566	.804															
7. DD_comp	3.63	1.33	−.088	−.202	−.404	−.153	.528	.429	.937														
8. DD_stan	4.21	1.25	−.176	−.155	−.048	−.332	.511	.388	.455	.812													
9. Trust	4.82	1.29	.132	.194	.255	.224	−.034	−.011	−.089	.063	.888												
10. dynami	4.96	1.24	.092	.124	.184	.171	.051	.051	−.009	.100	.679	.876											
11. expertise	5.08	1.51	.131	.161	.231	.201	.025	.048	−.036	.091	.855	.717	.944										
12. Trust tbb	4.77	1.44	.173	.236	.272	.282	−.016	.010	−.037	.081	.818	.542	.774	.936									
13. Trust tbi	4.75	1.42	.198	.238	.289	.264	−.002	−.026	−.044	.047	.760	.497	.744	.861	1.00								
14. Trust tbc	4.82	1.43	.182	.230	.307	.238	−.002	.003	−.033	.115	.792	.591	.807	.873	.857	.966							
15. D_dbb	3.57	1.53	−.060	−.143	−.157	−.191	.253	.129	.216	.143	−.724	−.478	−.683	−.728	−.679	−.702	.945						
16. D_dbi	3.65	1.47	−.075	−.181	−.166	−.227	.237	.151	.224	.170	−.707	−.471	−.669	−.699	−.672	−.696	.927	.933					
17. D_dbc	3.62	1.55	−.049	−.122	−.132	−.165	.191	.084	.179	.105	−.725	−.532	−.730	−.714	−.681	−.754	.901	.916	.945				
18. TI_tign	4.03	1.42	.092	.203	.247	.162	.050	.020	.051	.120	.703	.531	.708	.765	.724	.772	−.620	−.600	−.656	.935			
19. TI_tifa	4.33	1.41	.178	.223	.247	.207	.021	.015	.014	.070	.750	.546	.750	.822	.785	.827	−.673	−.678	−.721	.872	.938		
20. TI_tigi	1.82	1.35	.008	.150	−.016	.030	.092	−.024	.210	.085	.198	.087	.153	.212	.149	.157	−.079	−.074	−.078	.343	.279	1.00	
21. TI_timp	2.48	1.45	.060	.178	.138	.124	.007	−.058	.051	−.017	.376	.262	.354	.386	.352	.363	−.270	−.261	−.285	.465	.455	.595	.894

TABLE 5
Reliability Results for Reflective Subconstructs

Second-Order Construct	Reflective Subconstruct	No. of Items	Cronbach's α	Composite Reliability
Disposition to trust	Benevolence	2	0.723	0.878
	Integrity	3	0.824	0.894
	Competence	2	0.809	0.914
	Trusting stance	3	0.851	0.914
Disposition to distrust	Suspicion of humanity-Benevolence	3	0.789	0.875
	Suspicion of humanity-Integrity	3	0.804	0.842
	Suspicion of humanity-Competence	2	0.864	0.935
	Distrusting stance	4	0.844	0.883
Trusting beliefs	Benevolence	3	0.943	0.955
	Integrity	1	1.000	1.000
	Competence	2	0.931	0.965
Distrusting beliefs	Benevolence	2	0.896	0.943
	Integrity	4	0.958	0.964
	Competence	4	0.967	0.971
Trusting intentions	Willingness to depend	3	0.929	0.955
	Subjective probability of depending—Follow advice	4	0.955	0.967
	Subjective probability of depending—Give information	1	1.000	1.000
	Subjective probability of depending—Make purchases	3	0.873	0.922
Source credibility	Trustworthiness	14	0.982	0.981
	Expertise	4	0.970	0.971
	Dynamism	6	0.945	0.952

TABLE 6
Manipulation Check Means and Standard Deviations for Main Effects

Treatment	Trustworthiness *M* (*SD*)	Expertise *M* (*SD*)	Dynamism *M* (*SD*)
Logo low	4.63 (1.37)	4.86 (1.61)	4.78 (1.30)
Logo high	5.01 (1.17)	5.32 (1.37)	5.16 (1.15)
Web low	4.68 (1.26)	4.87 (1.55)	4.72 (1.28)
Web high	4.95 (1.31)	5.28 (1.46)	5.19 (1.16)

distrust—represent an important finding. In our rigorous statistical validation procedures, trust and distrust were found to have sufficient discriminant and convergent validity, as predicted in our model. This supports the notion that trust and distrust are two separate constructs and should be treated as such. This further informs the ongoing debate (noted in our article) on the matter.

Our findings regarding source credibility and its relation to online trust-building constitute a significant forward movement in understanding credibility on the web. First, our research points to credibility traits of the website owner—trustworthiness, expertise, and dynamism—as important predictors of trust in online environments. We could find no previous empirical work that establishes perceived credibility of the website sponsor as an antecedent of trusting and distrusting beliefs. Our research provides evidence supporting this relationship, showing that when websites are successful in convincing users that the website sponsor is credible, users' will be more trusting and more willing to transact with the company.

Second, in the context of recent web credibility research that describes different channels for building source credibility (Fogg, 2003a), our findings highlight the importance of building surface credibility in online contexts. Our manipulations of credibility traits of the website and the firm logo, as nonverbal, visual elements, are direct manipulations of surface credibility. Although previous research has typically considered source credibility more generally (Kensicki, 2003; Robins & Holmes, 2008), the results of our study indicate that surface

TABLE 7
Manipulation Check Means and Standard Deviations for Interaction Effects

	Website Credibility Manipulation	
Rated Credibility Trait of Website Sponsor	Low *M* (*SD*)	High *M* (*SD*)
High logo credibility		
Trustworthiness	4.92 (1.18)	5.11 (1.15)
Expertise	5.15 (1.41)	5.49 (1.32)
Dynamism	5.03 (1.16)	5.29 (1.12)
Low logo credibility		
Trustworthiness	4.43 (1.30)	4.80 (1.42)
Expertise	4.58 (1.63)	5.09 (1.56)
Dynamism	4.39 (1.32)	5.10 (1.19)

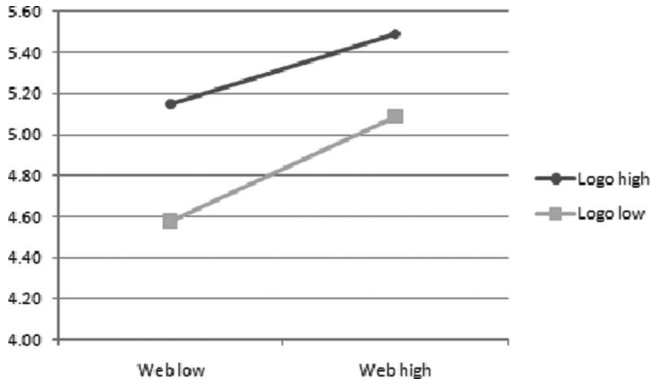

FIG. 11. Interaction effects for dynamism.

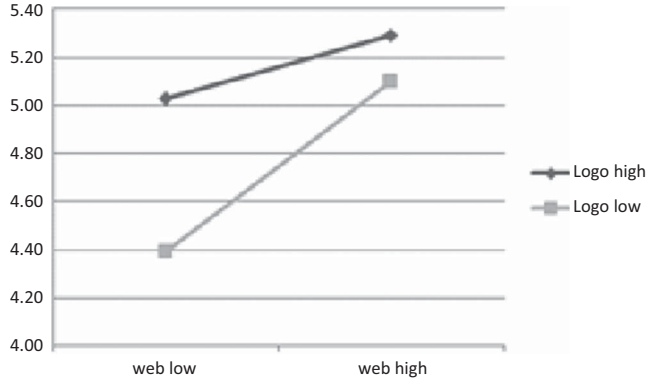

FIG. 12. Interaction effects for expertise.

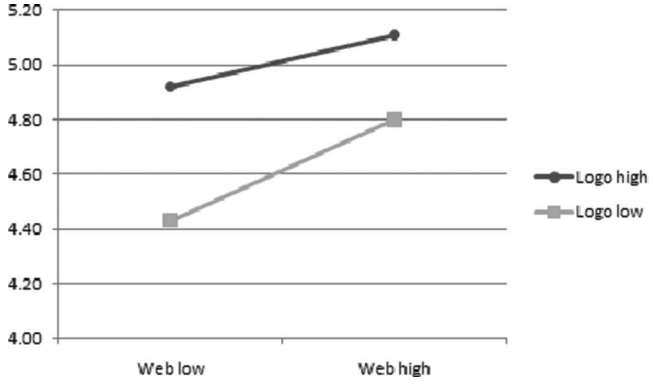

FIG. 13. Interaction effects for trustworthiness.

credibility, built largely through quick glances and "gut reactions," can also play a crucial role in influencing downstream attitudes and behaviors.

Nonverbal, visual elements such as logos are a new, novel way in which to build surface credibility and influence users' evaluations of websites and their owners. Many elements of websites such as privacy policies (Resnick & Montania, 2003; Tsai, Egelman, Cranor, & Acquisti, 2011), security seals (Belanger, Hiller, & Smith, 2002; Lowry et al., 2012; Mauldin & Arunachalam, 2002), or third-party branding (Lowry et al., 2008) have been shown to influence online users' trust, but these all require some level of cognitive processing to be effective. For example, one has to first read and understand a privacy policy in order for that policy to affect users' attitudes regarding the website (Proctor, Ali, & Vu, 2008). Our study shows that source credibility, built through nonverbal, visual elements that are processed at a glance, can also directly influence users' trust-related beliefs regarding the website. This falls in line with other research showing that visual design elements affect trust in online environments (Everard & Galletta, 2005; Fogg et al., 2002; Lowry et al., 2008; Robins & Holmes, 2008), but no prior research has linked the design of the logo itself to increases in trust. Given the necessity of quickly establishing trust in online environments (Peracchio & Luna, 2006), these are important findings that future research can build upon.

In addition to these theoretical contributions, our research has direct significance to practice. Web designers are continually looking for ways to effectively design websites that are high quality and visually appealing. Nevertheless, our research

TABLE 8
Tukey Honestly Significant Difference Results for Multiple Comparisons of Means Resulting from Interaction of Logo and Website Treatments

Dependent Variable	Interaction Treatment (I)	Interaction Treatment (J)	Mean Difference (I-J)[a]	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Trustworthiness	Low Logo × Low Website	Low Logo × High Website	−0.490*	0.031	−0.948	−0.032
		High Logo × Low Website	−0.372	0.138	−0.818	0.073
		High Logo × High Website	−0.679**	0.001	−1.137	−0.221
	Low Logo × High Website	Low Logo × Low Website	0.490*	0.031	0.032	0.948
		High Logo × Low Website	0.118	0.901	−0.322	0.557
		High Logo × High Website	−0.189	0.703	−0.641	0.263
	High Logo × Low Website	Low Logo × Low Website	0.372	0.138	−0.073	0.818
		Low Logo × High Website	−0.118	0.901	−0.557	0.322
		High Logo × High Website	−0.307	0.275	−0.746	0.133
	High Logo × High Website	Low Logo × Low Website	0.679**	0.001	0.221	1.137
		Low Logo × High Website	0.189	0.703	−0.263	0.641
		High Logo × Low Website	0.307	0.275	−0.133	0.746
Dynamism	Low Logo × Low Website	Low Logo × High Website	−0.637**	0.001	−1.069	−0.205
		High Logo × Low Website	−0.711***	0.000	−1.132	−0.291
		High Logo × High Website	−0.897***	0.000	−1.329	−0.465
	Low Logo × High Website	Low Logo × Low Website	0.637**	0.001	0.205	1.069
		High Logo × Low Website	−0.075	0.967	−0.489	0.340
		High Logo × High Website	−0.260	0.395	−0.687	0.166
	High Logo × Low Website	Low Logo × Low Website	0.711***	0.000	0.291	1.132
		Low Logo × High Website	0.075	0.967	−0.340	0.489
		High Logo × High Website	−0.186	0.656	−0.601	0.229
	High Logo × High Website	Low Logo × Low Website	0.897***	0.000	0.465	1.329
		Low Logo × High Website	0.260	0.395	−0.166	0.687
		High Logo × Low Website	0.186	0.656	−0.229	0.601
Expertise	Low Logo × Low Website	Low Logo × High Website	−0.568*	0.033	−1.103	−0.032
		High Logo × Low Website	−0.511	0.057	−1.032	0.010
		High Logo × High Website	−.911*	0.000	−1.446	−0.375
	Low Logo × High Website	Low Logo × Low Website	0.568*	0.033	0.032	1.103
		High Logo × Low Website	0.057	0.992	−0.458	0.571
		High Logo × High Website	−0.343	0.340	−0.872	0.186
	High Logo × Low Website	Low Logo × Low Website	0.511	0.057	−0.010	1.032
		Low Logo × High Website	−0.057	0.992	−0.571	0.458
		High Logo × High Website	−0.399	0.188	−0.913	0.115
	High Logo × High Website	Low Logo × Low Website	0.911***	0.000	0.375	1.446
		Low Logo × High Website	0.343	0.340	−0.186	0.872
		High Logo × Low Website	0.399	0.188	−0.115	0.913

[a]$p < .05$.
**$p < .01$. ***$p < .001$.

TABLE 9
Results of Hypothesis Test of Path Model

Hypothesis	β	p Value[a]	Supported?
H4a. Disposition to trust → trusting beliefs	0.13	<.01**	Yes
H4b. Disposition to trust → (-) distrusting beliefs	0.01	.37(*ns*)	No
H5a. Trusting beliefs → trusting intentions	0.76	<.01**	Yes
H5b. Distrusting beliefs → (-) trusting intentions	−0.12	.01*	Yes
H6a. Disposition to distrust → distrusting beliefs	0.28	<.01**	Yes
H6b. Disposition to distrust → (-) trusting beliefs	0.02	.32(*ns*)	No
H7a. Credibility → trusting beliefs	0.83	<.01**	Yes
H7b. Credibility → distrusting beliefs	−0.76	<.01**	Yes

[a]$p < .05$.
**$p < .01$. ** *$p < .001$.

indicates that in order for users and potential customers of e-commerce sites to trust the website enough to transact, the user needs to also be persuaded that the firm sponsoring the site is credible. Quality site design and other factors such as security seals (Belanger et al., 2002; Mauldin & Arunachalam, 2002) and third-party branding (Lowry et al., 2008) can help induce trust. However, a focus on building perceptions of the traits of credibility can also be highly effective. For example, matching a modern, trendy design motif with a company that is supposed to be an old, established company could reduce the perceptions of users that the company has the long-term experience that they expect. Alternatively, incorporating visual elements that are unrelated to the core competencies of the company could also reduce the perceptions that the company has expertise in a given area or industry, or at the very least represent a missed opportunity to communicate increased credibility. Web designers can focus on the traits of credibility as they form their design strategies to build more effective e-commerce portals.

Another contribution to practice relates to the finding that, despite very short exposure to credibility-based logo and website designs, our manipulations still produced significant differences in participants' beliefs regarding the website sponsors. Prior research has shown that logos effectively communicate a great deal of information in a simple, quickly processed image (Henderson & Cote, 1998; Henderson et al., 2003; Tavassoli & Lee, 2003; van den Bosch et al., 2006). Our results indicate that logos can be effectively employed to trigger positive credibility assessments in a very short time. Web designers are deeply aware of the short time afforded an unfamiliar website before a decision is made whether to continue transacting or to move on to another website (Peracchio & Luna, 2006; Thompson, 2004). The results of our study indicate that designers and businesses can leverage the prominence of logos on web pages to help convince users of their credibility in the crucial first few seconds of the interaction.

Our study indicates that one way logos can be used to build credibility on the web is by incorporating traits of credibility into the design of the logo itself. Thus, our research has direct significance to current practices in logo design. Logos are considered a crucial part of the visual identity or reputation of a firm (Cohen, 1986; Henderson & Cote, 1998; Melewar, 2003). This research builds on the research of Haig and colleagues (Haig, 1979, 2006, 2008; Haig & Harper, 1997) and further confirms the effectiveness of credibility-based logo design. Incorporating traits of credibility into the design of a logo has been shown to increase the perceptions of credibility of the firm represented by the logo. Further validating this principle in an e-commerce setting, our research provides strong evidence for logo designers that credibility traits should be incorporated into the design of logos, particularly for online businesses.

Last, our findings indicate that surface credibility is most effectively built when the design of the site is effectively complemented with a similarly designed logo. This falls in line with marketing literature on brand consistency (Braun-LaTour & LaTour, 2004; Changjo, Hae-Kyong, & Youngchan, 2009; Erdem & Swait, 1998; Keller, 1998; Swait & Erdem, 2002), in which consistency in communicating firm attributes is known to produce perceptions of credibility about the firm (Erdem & Swait, 1998). Web designers should use credibility-based logos in conjunction with credibility-based website design for maximum impact on users' perceptions about the represented firm.

We now provide several practical guidelines (see Table 10) to aid logo and web designers in designing logos that will help trigger positive credibility assessments on a website. Each of these guidelines is grounded in SCT, and each concept has received support in the results of our study. These guidelines would be of particular interest to logo or web designers of businesses trying to attract new customers in a market where the business is relatively unknown. For such businesses, quickly establishing credibility with potential customers is a crucial point of success, and efficiently communicating credibility using the elements of logo design prescribed here would be an effective way to accomplish these goals.

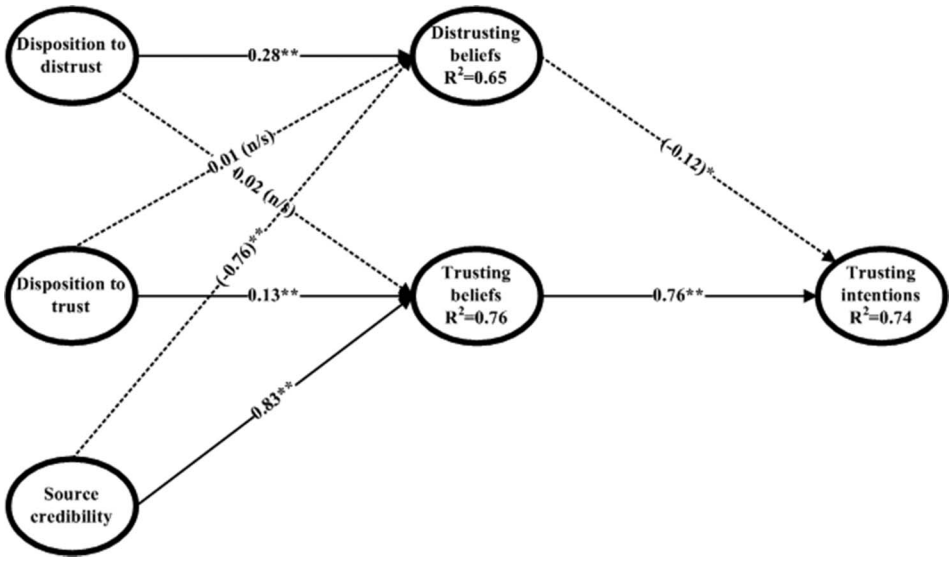

FIG. 14. Final model testing results.

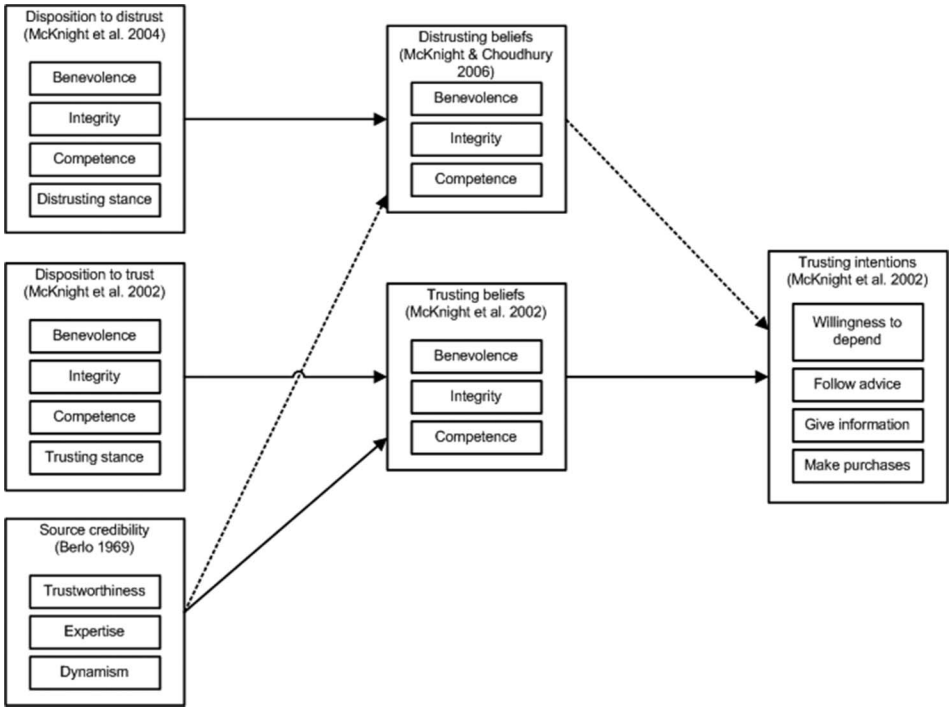

FIG. 15. Final proposed trust-distrust-credibility model.

6.2. Limitations and Future Research

Limitations should be considered in interpreting our results. First, our theory was tested using a simulated browsing environment—participants were shown screenshots of websites rather than actually browsing the sites in a Web browser. This methodology was selected for ease of data collection and is consistent with other studies involving websites, but this provides a key opportunity for future research in online trust and credibility. The vast majority of research performed in this context is done in a similar, controlled environment. Recently, web analytics tracking software has been introduced as a viable data collection method (Bucklin & Sismeiro, 2003; Ghose & Yang, 2009; Moe & Fader, 2001, 2004; Park & Fader, 2004; Tyagi, 2010). The main advantage of using such methods to support theoretical models is that analytics data represent actual behavior, whereas simulated environments paired with surveys

TABLE 10
Practical Guidelines for Credibility-Based Logo and Web Design

Guideline	Description	Example
Logo design should incorporate traits of expertise.	Logos should, if possible, embody an image representative of the business' area of expertise.	A house painting company could use a logo that combines imagery of a paintbrush and a house. A printing company could use a logo with imagery of paper.
Logo design should incorporate traits of trustworthiness.	Logos should generally be harmonious and simple, which are reassuring (Henderson, et al., 2004), and use color schemes that communicate safety or reliability (Hynes, 2010). These trustworthiness traits should also be consistent with the traits of expertise designed into the logo, since consistency communicates trustworthiness (Berlo, et al., 1969; Giffin, 1967).	A bank wishing to communicate trustworthiness or solidarity could choose a simple image in solid, safe colors (blue, brown, or green) and use a design style that communicates longevity (e.g., serif text in capital letters).
Logo design should communicate expertise and trustworthiness with clarity and simplicity.	Dynamism refers to the way in which a message is communicated, and a logo design should be clear and easy to interpret. Logos which are highly detailed, improperly contrasted against background, or which contain hard-to-read text do not embody the trait of dynamism.	A plumbing company, rather than designing an intricate depiction of plumbing hardware or materials, could instead choose a stylized, easily interpreted plumbers wrench, paired with simple, easy-to-read text.
Website design should match and complement credibility-based logo design.	Consistency between website and logo design communicates reliability and increase credibility (Cappiello, et al., 2003; Loiacono, et al., 2007; Steinfield, et al., 2002). As is common in practice, websites should be designed to match the design characteristics (color, motif) of the accompanying logo.	A home construction company, whose logo includes an element of a house and colors representing homeliness (e.g., earth tones), could choose a site design and color scheme which complements these design elements and extends the communication of the logo.

typically represent intentions to act (e.g., trusting intentions). Future research should investigate whether actual browsing behavior follows a pattern similar to that reported in this research.

Another potential limitation of our methodology is the short time afforded the participants to form their opinions about the company sponsoring the sample website. Because logos were placed prominently (top/left) in all of our manipulations, and given the tendency of logos to draw users' attention more than other features of a web page, the logos' effects may have been somewhat inflated. However, this fact also emphasizes a key strength of our methodology and findings. As previously noted, we effectively show that in our sample, infusing the company logos with traits of credibility produced positive judgments of the company, even in the short amount of time given the participants to view and assess the hypothetical company's website, which has great practical value for both designers and online businesses. However, future research could investigate the effectiveness of our credibility-based logo design principles when logos are placed in less prominent locations on the web page, or when users are allowed to examine a website for a longer time.

A third limitation to our study involves the operationalization of the credibility traits in the logo design. The expertise dimension is rather simple to incorporate into the design of a logo—using a variant of house and a paintbrush for a house painting firm's logo, for example. The dynamism dimension is also easily operationalized—using a bold, simple design form with all symbolic redundancies removed so there is highly dynamic communication and impact. However, trustworthiness is more difficult to quantify and operationalize. Our trustworthiness manipulations, particularly with the logo manipulations, are based in part on the sparse, available peer-reviewed literature on the matter (Bottomley & Doyle, 2006; Henderson et al., 2004; Hynes, 2010; Jacobs et al., 1991), and in part on best practices within the design industry (Gatto, et al., 1999; Logo Design Team, 2011; Taylor, 2011; Tersiiska, 2011). For example, designers have used "contemporary" shapes for years to communicate such traits as "high tech," "efficient," and "forward thinking" (Xerox, IBM, United Airlines, Rockwell, ALCOA, AT&T). Designers also use classic stable shapes such as a circle, square, or oblong such as in the familiar AT&T logo, which shapes communication stability or experience (Gatto et al., 1999; Tersiiska, 2011). These best practices, however, have not been fully empirically validated, and future opportunities exist for researchers to determine what nonverbal visual forms communicate desired verbal traits. We have empirically shown that credibility-based logos do increase perceptions of trustworthiness. However, how and why certain design features nonverbally communicate certain traits remain to be fully explored.

7. CONCLUSION

Our study research has provided an innovative look at how surface credibility can be built into logo and website design. We have shown that credibility-based logo design and credibility-based site design quickly trigger positive perceptions regarding the credibility of the firm sponsoring the website, which produces trusting beliefs and intentions. This suggests that practitioners who want to foster credibility can look to improve the site logo by incorporating traits of credibility into its design. With an accompanying credible site design, users will be more inclined to transact using the website. These results add to the evolving discussion of trust in online environments and suggest several unexplored avenues through which trust can be built.

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