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The Dimensions of Web Site Credibility and Their Relation to Active Trust and Behavioural Impact

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I. INTRODUCTION

Social marketing is an approach to social and individual behavioural change that draws upon concepts and techniques from commercial marketing. While commercial marketers encourage consumers to exchange money for products or services, social marketers encourage individuals to exchange unhealthy lifestyles for healthy ones [Kotler and Roberto 1989]. For social marketers, public awareness and attitude change are not as important as behavioural impacts, which have been deemed social marketing's ultimate "bottom line" [Andreasen 2002]. Typically, social marketing campaigns address public health, environmental protection, safety, and social development issues [Kotler et al. 2002]. Social marketing is not a single theory; rather, it is a marketing approach that draws together knowledge from fields such as psychology, sociology, anthropology and communications theory to influence behaviours [Gordon et al. 2006].

Several studies have shown that the Internet can be a powerful medium to conduct social marketing. One meta-analysis of 22 papers, comparing Web-based versus non-Web-based health interventions, provided strong empirical evidence that online interventions significantly increased participants' knowledge and healthy behaviours [Wantland et al. 2004]. Another meta-analysis of computer-delivered health and behavioural risk interventions showed that Internet-based interventions significantly improved participants' knowledge, attitudes and behaviours in comparison to other methods [Portnoy et al. 2008]. Regarding e-mail, one experiment concluded that sequential e-mails can help people maintain exercise regimes [Franklin et al. 2006]. Two other experiments—on traditional behavioural change techniques frequently cited by social marketers—showed that the foot-in-the-door technique [Gueguen 2002] and obtaining a commitment [Artz and Cooke 2007] can operate through e-mail.

Although academic studies show the potential of the Internet, investigations of real-world applications paint a different picture. One audit of online health interventions concluded that many campaigns did not meet the minimum criteria to achieve behaviour change. To be effective, the researchers argued that Web sites need to move beyond simple information campaigns and focus on behavioural change [Evers et al. 2003].

A partial explanation for the differences between studies and applied interventions may relate to credibility and trust, which are frequently present, to some degree, in experimental and institutional study settings. For example, the two e-mail-based behavioural change experiments described earlier—by Gugen [2002] and Artz and Cooke [2007]—were conducted within institutional settings where credibility and trust already existed to some degree. In the earlier study, students were lead to believe the requester was a student from their university, while in the later, employees knew the e-mail sender was a colleague, while many may have known him personally. In other research, credibility and trust may have been even stronger, such as evaluations of online interventions that helped users quit smoking [Lenert et al. 2004] or increase their physical activity [Marshall et al. 2003], which were carried out by reputable scholars from established academic institutions.

In real-world interventions, two trends are working against social change campaigners: growing online competition and declining trust. They are rooted in growing threats from online crime, misinformation and other online abuses. For example, one study of online scams found that 90 percent of participants (including technical experts) could not differentiate between legitimate and criminal Web sites [Dhamija et al. 2006]. This may explain why, in 2007, U.S. citizens lost $239 million to online crime [Internet Crime Complaint Center 2007], while in Canada and the U.S., merchants lost $3.6 billion due to e-fraud [Cybersource 2008]. In addition, Internet users may mistrust companies because of privacy and spam concerns [Lou 2002]. Other online threats include racist organizations, which spread hate ideologies and misinformation in the form of benevolent grass roots campaigning, even targeting youth and children [Bostdorff 2004]; and the recent rise of anti-Semitism on social networking Web sites [Obler 2008]. It is likely that these growing threats are contributing to perceptions that the Internet is a high-risk, low-trust environment where widespread threats can be expected to raise the costs of believing or acting on the advice of social campaigns, thus potentially forming resistance to online engagement.

Beyond growing threats, online campaigns are increasingly operating in highly competitive environments. Traditionally, social marketers compete against behaviours that may be promoted by individuals, organizations, or even entire industries [Andreasen 2006]. For instance, when social marketers advocate a particular behaviour—such as quitting smoking—they can expect vested interests from the private sector to promote the opposite: smoking. Similarly, medical Web sites promoting public health advice may have their efforts undermined by misinformation and urban legends. Online, competition may be tougher than in other traditional media. For example,

researchers in 2005 revealed that the U.S. government restricted pro-smoking advertising in traditional media; however, the tobacco industry continued advertising online, and even crossed ethical lines by developing interactive games and contests aimed at engaging youth [Lin and Hullman 2005]. In this competitive environment, many people act on information, but infrequently verify the source of their information. In 2006, roughly 80 percent of Americans searched for online health information with 55 percent acting on their findings. Surprisingly, 75 percent of these persons only verified the source and date sometimes, hardly ever, or never [Fox 2006].

To overcome poor perceptions of marketing efforts, source credibility and trust are traditionally factored into social marketing campaigns. In offline contexts, social marketers have been advised to build their campaigns around credible actors who hold the public's trust [McKenzie-Mohr and Smith 1999]. This approach is based on evidence that that source credibility of organizations and individuals operating interventions can impact on the degree to which target audiences are likely to adopt alternative behaviours [Kotler and Roberto 1989]. In online contexts, superficial Web site features can be used as a basis for user evaluations of source credibility [Fogg 2003]. Likewise, e-commerce literature suggest that trust of a company is a key factor behind online purchasing behaviour [Jarvenpaa et al. 2000]. Applying these ideas to nonprofit contexts, this investigation examines the relationships between a Web site's source credibility, users' trust of that Web site and their willingness to be more active in a campaign.

This paper makes a number of contributions. First, whereas many papers blur the concepts of credibility and active trust, we present a theoretical model which contrast these and examine their interrelationship. Second, we apply concepts from commercial e-marketing sales behaviour to nonprofit e-marketing contexts. Third, we provide arguments to suggest extensions of social exchange theory online. Fourth, we provide evidence that Web site credibility may be perceived in a human-like way. Finally, we suggest how the study findings may be built into social marketing campaigns.

To gain a deeper understanding of these issues, this study combines two separate fields: social marketing and persuasive technology. While persuasive technology aims to influence attitudes and behaviours through technology interactions [Fogg 2003], social marketing aims to influence beliefs, attitudes, and behaviours through marketing interventions [Kotler and Roberto 1989]. Persuasive technology is more concerned with persuasive media effects than any particular message or audience; conversely, social marketing is more concerned with audiences and messages effects than any particular media; and the fusion of both fields appears promising when applied to online social marketing.

II. THEORETICAL BACKGROUND

Social Exchange Theory

Although many behavioural change theories appear within social marketing literature, perhaps the most popular is social exchange theory, which is rooted in commercial marketing theory [Lefebvre 2000]. Social exchange theory takes a rational view of human behaviour; it argues that social exchanges occur between people and/or organizations who conduct transactions in order to maximize their rewards and minimize their costs. For example, a company may sell a product where money constitutes their reward, while the product's benefits comprise the customer's rewards [Bagozzi 1974].

Social exchange theory manifests in the 4Ps framework which encompass the concepts *product*, *price*, *place,* and *promotion*. Both *product* and *price* compose the social exchange theory components, where the *product* constitutes the buyer's rewards and the *price* constitutes the costs that must be exchanged. Expressing a social exchange in the language of the 4Ps, a person is likely to partake in a behavioural exchange when the benefits of a *product* outweigh the *price*.

Although commercial marketing literature has moved beyond the 4Ps, traditionally, the 4Ps are considered the key variables that marketers can manipulate in order to increase or decrease demand for a given product or service [Kotler et al., 2002]. The 4Ps is still the most prominent behavioural change model used by social marketers, as indicated by the number of leading social marketing publications that still use it.

Relationship Marketing

Looking at social exchanges over time, relationship marketing defines customer loyalty as a form of repeat behaviour resulting from long-term beneficial exchanges [Ganesan, 1994]. Relationship marketing is considered a paradigm shift away from thinking of markets in terms of competition, and a shift towards seeing marketing as mutual interdependence and cooperation. Relationship capital has been defined as the knowledge, experience, and trust a company has with its customers, employees, suppliers, and distributors [Kotler 2003].

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Researchers have argued that long-term customer relationships are founded on a commitment to the relationship and trust [Morgan and Hunt 1994] or on a dependence relationship and trust [Ganesan 1994]. When examining relationship marketing and social exchange theory online, trust has been deemed the central concept for commercial relationships, with mistrust being designated the major impediment to e-commerce behaviour [Lou 2002]. Within a nonprofit context, long-term relationships are founded on trust and can be regarded as repeat user behaviour.

Social Cognitive Theory

Social cognitive theory explains how individuals acquire new skills and behaviours through an interactive process between their internal volition and external social determinants [Bandura 1989]. A key sequence within this theory is the relationship between a person, his or her behaviour and a behavioural outcome. Within social cognitive theory, to influence behaviour, a person requires an outcome expectation where he or she believes a particular behaviour will lead to a desired outcome. Also, people require self-efficacy which describes their belief that they are capable of performing given behaviours; and the more they believe they can perform tasks, the more likely they are to perform them [Bandura 1982]. In other words, for a person to act, he or she requires a motivating outcome expectation and self-efficacy that he or she can perform the required behaviours.

Online campaigns frequently express behavioural appeals in the form of statements that follow the logic "If you perform this behaviour, then a good outcome will result" or negatively, "If you do not perform this behaviour, then a bad outcome will result." Formally it reduces to "If X, then Y" or "If NOT X, then NOT Y." An example would be "If you donate, you can immunize a child and improve their wellbeing, but if you do not, they may become sick." When applying this logic to social cognitive theory, nonprofit appeals can be regarded as outcome expectation claims. If audiences accept the causal link between behaviour X and outcome expectation Y, according to social cognitive theory, they are more likely to perform the behaviour (provided they have sufficient motivation and self-efficacy). However, trust is a factor in this process because persons who do not believe the claim that behaviour X leads to outcome Y, are unlikely to act. Within this framework, trust or mistrust in an organization can be seen as a factor that may impact whether a person believes behaviour X leads to outcome expectancy Y. In other words, if an organization claims that donations will be spent to immunize children in need, but target audiences mistrust the organization, then these audiences are unlikely to believe that donating (behaviour X) will immunize children (outcome expectation Y). Consequently, they are unlikely to act on the appeal of such an organization as their efforts would be perceived as useless.

Elaboration Likelihood Model and Source Credibility

According to the elaboration likelihood model, individuals are influenced by a particular appeal as a result of central or peripheral route processing. Central route processing describes the process of elaborating on an appeal by paying attention to an argument and evaluating it. Peripheral route processing describes the process of drawing conclusions from rules of thumb or reliance of heuristic cues without much regard toward the actual merits of an argument [Petty and Cacioppo 1986; O'Keefe 2002].

For audiences who are neither motivated nor capable of assessing the merits of an appeal, peripheral route processes, such as reliance on source credibility, may determine whether or not they accept the proposition [O'Keefe 2002]. Consequently, behavioural impacts associated with Web site source credibility are likely to be relevant to low-involvement individuals who rely on rules of thumb and who may be influenced by unconscious assumptions about what constitutes a credible source. Applied to persuasive technology, source credibility is perceived differently according to a person's interest and familiarity with a particular subject matter, with low interests/familiarity persons perceiving credibility as a binary value: either credible or not; medium interests/familiarity persons perceiving credibility above or below a variable threshold; and high interests/familiarity persons perceiving a continuum from credible to not [Fogg and Tseng 1999].

Media Equation and Functional Triad

When investigating online interventions, it is not always clear who or what target audiences attribute as the source of the campaign. Online, source attributions can be difficult to identify. For example, users' perceptions of the source of an online intervention may be attributed to campaign spokespersons; authors of Web site content; the Web site's Webmaster, graphic designer or editor; the intervention planners; the Web site in general; partner organizations, or the campaign in general. This ambiguity presents a serious challenge to researchers, as it is difficult to research the source of a communications campaign when it not always clear who or what users regard as the source.

To clarify this ambiguity, a growing body of literature suggests that people interact with media and technology as if the media itself constitutes a social actor. The two most popular frameworks are the media equation and the functional triad. First, the media equation has amassed a large volume of studies that show concepts of human-to-human psychology also operate between people and media, such as television, computers, or Web sites [Reeves

and Nass 2003]. Second, research on computers as persuasive technology (captology), argues that people interact with technology in three distinct ways: as tools, as media, and as social actors [Fogg 2003]. By these theories, models of human-with-human credibility can be applied to human-with-computer applications. Further, the source of an online intervention can be attributed to the Web site itself, consequently in this paper, Web sites are treated as credibility sources and the primary units of analysis.

III. MODEL DEVELOPMENT

This investigation examines the relationships between *Web site credibility*, *active trust* and *behavioural impact*. In doing so, two models are presented in Figure 1 and subsequently evaluated. The difference between the two models is their treatment of a Web site's *visual appeal*. As discussed following, the two-dimensional credibility model represents a widely used computer credibility framework; in this model, *visual appeal* is not regarded as a core component of credibility, and consequently, it is treated as an exogenous variable. In this model, *visual appeal* exerts influence on the two credibility dimensions, which are themselves interrelated. The three-dimensional credibility model is based on Ohanian's [1990] celebrity endorser credibility model where *visual appeal* acts as a credibility dimension. In this model, we treat *visual appeal* as a credibility dimension where all variables correlate with one another. In other words, we are contrasting the two-dimensional computer credibility model against the three-dimensional human credibility model.

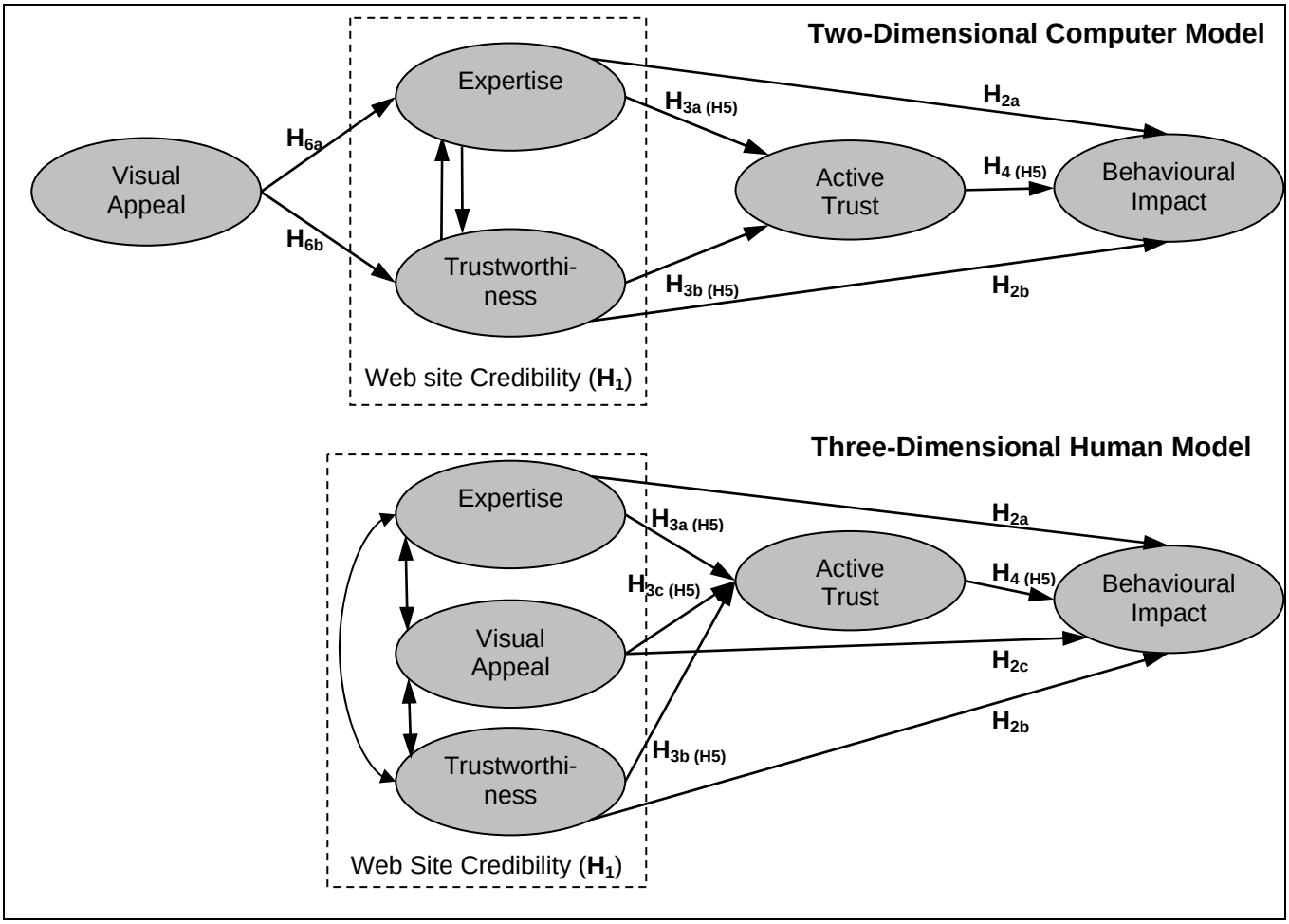

Figure 1. Two- and Three-Dimensional Models

We define the dependent variable, *behavioural impact*, as a change in users' campaign activity and future willingness to support the campaign, because of using the Web site. *Web site credibility* describes users' perceptions of Web site *expertise,* and *trustworthiness*. Theoretically, the two *Web site credibility* variables should correlate as they represent two components of a larger construct. *Visual appeal* describes a person's judgement of a site's aesthetic design quality. *Active trust* describes whether a user feels confident or unconfident acting on the advice of the Web site.

Across both models, a clear distinction exists between *Web site credibility*, *active trust,* and *behavioural impact. Web site credibility* represents a psychological judgement that a Web site's content is believable. *Active trust* defines a

person's confidence in acting on the advice of the Web site. When moving from *Web site credibility* to *active trust*, a user would transition from psychological judgements of the source, to an assessment of their confidence in acting on the advice of that source. *Behavioural impact* represents a person's actions and willingness to act in the future. Although *active trust* is related to *behavioural impact*, it differs in that *active trust* describes the confidence in acting, while *behavioural impact* represents the action and future willingness. These definitions will be further defined in the subsequent section.

Within this model, trust mediates the impact of *Web site credibility* on *behavioural impact*. In a prior paper we found support for a bi-directional relationship between *Web site credibility* and *behavioural intent* [Cugelman et al. 2008]. However, to reduce complexity in this analysis, only one-way relationships are explored. Moreover, in this paper, a larger data set is used and the dimensions of *Web site credibility* are examined.

IV. VARIABLES AND HYPOTHESES

Behavioural Impact (Dependent Variable)

Although behaviour is the "bottom line" of social marketing, it is very difficult to directly observe behaviours resulting from online campaign interactions. An alternative measure, behavioural intent, has been shown to be a strong predictor of behaviour across numerous empirical studies. This association is well documented and explained by the theory of reasoned action [Sheppard et al. 1988] and the subsequently updated theory of planned behaviour [Armitage and Conner 2001]. For example, one meta-analysis showed that both these theories could effectively predict condom use across a large number of public health interventions [Albarracin et al. 2001]. Another popular behavioural change theory, the trans-theoretical approach, also called stages of change, demonstrated the impact of *behavioural intent* across numerous studies. For example, people who intended to change their behaviour—to adopt a virtue or drop a vice—were statistically much more likely behave in accordance with these intentions than others who had no intentions [Prochaska et al. 1995].

Although behavioural intent is a common proxy measure of behaviour, it is distinct from behavioural expectations and willingness. Intention describes a person's plan to act out a given behaviour; behavioural expectations describe how someone believe they will probably behave; while willingness describes their readiness to act should an opportunity present itself. Research has shown behavioural expectations, willingness, and past behaviours are also strong proxy indicators of behavioural outcomes [Gibbons et al. 1998]. In this paper, *behavioural impact* describes a blended measure that cuts across these concepts by assessing past behaviour and future expectations about behavioural willingness as a result of using a particular Web site.

Web Site Source Credibility (Model Comparisons)

Across the literature, different authors propose that source credibility is composed of different dimensions; however, two similar frameworks include the three-dimensional human celebrity endorsers' model and the two-dimensional computer model. In developing the three-dimensional model, Ohanian [1990] reviewed a number of instruments before empirically developing and evaluating a credibility scale composed of trustworthiness, expertise, and attractiveness. For the two-dimensional model, Fogg and Tseng [1999] presented a simplified model, reducing a range of credibility factors to just two dimensions: trustworthiness and expertise. One key difference between these two models is how they treat visual attractiveness. In Ohanian's work, attractiveness is deemed a factor that composes credibility, while in Fogg and Tseng's work, visual attractiveness seems closest to the concept of a surface credibility assessment, and would consequently be treated as a way of experiencing credibility, not a core dimension. Given these different ways of treating visual attractiveness in relation to credibility, in this study, we use the conventional notion of computer credibility which composes perceived *trustworthiness* and *expertise*. Adopting the conventional computer credibility model, we propose that:

H1: Web site credibility is a two-dimensional construct (trustworthiness, expertise) and will fit the data better than the three-dimensional construct (trustworthiness, expertise, visual appeal).

Website Source Credibility (Independent Variable)

Aristotle argued that persuasive rhetoric was influenced by three factors: the character of the speaker, the disposition of the audience and the speech itself. Persuasion by character happened—Aristotle argued—when a speaker's personal characteristics rendered credence to an argument [Lawson-Tancred 1992]. Today, definitions of source credibility are remarkably similar: a communicator's positive characteristics that affect receivers' acceptance of a message [Ohanian 1990], or in a computer credibility context, a perceived quality that one person has in another which results in believability [Fogg and Tseng 1999].

Researchers have discussed and empirically measured the association between source credibility and behaviour. Presumably, high credibility sources can positively impact on behaviour, whereas low credibility sources are less likely to contribute a *behavioural impact* [Hassan et al. 2007]. Empirically, during the development of a scale to measure a celebrity endorser's credibility, a significant association was shown between celebrity endorsers' credibility and participants' purchase intentions [Ohanian 1990]. We thus propose that:

H2: Web site credibility increases behavioural impact.

There is little research that addresses the relationship between credibility and trust. Perhaps this is due to authors, of academic and professional literature, who sometimes use the terms credibility and trust synonymously, even though they refer to different concepts [Fogg, 2003]. Despite occasional conceptual blending, the distinction between the two concepts is found among social marketing literature, which advises campaigners to build their campaigns around credible persons who hold the public's trust [McKenzie-Mohr and Smith 1999]. While in regards to online behaviour, trust has been deemed the primary intermediary between customers' perceptions and their willingness to conduct Internet purchases [Jarvenpaa et al. 2000]. Credibility can be regarded as a psychological judgment of believability, while *active trust* represents a behavioural confidence in acting on the advice of a source. We thus propose that:

H3: Website credibility increases active trust.

Active Trust (Independent Variable)

Trust is widely deemed an essential component of social and personal relationships. Authors have described it as a core component of the social capital which bind societies together [Putnam 2000] and as the basis for quick and effective business transactions [Covey and Merrill 2006]. Across the literature, trust has been described as a factor that relates to behaviour directly and also through mediation. As already described previously, trust has been deemed the primary intermediary between customers' perceptions and their willingness to conduct online purchases; but also, by increasing trust, business can increase the willingness of prospective customers to shop online [Jarvenpaa et al. 2000]. Likewise, online trust has been considered a psychological intermediary between a Web site's physical characteristics and users' behavioural intentions [Bart et al. 2005]. Apart from purchase behaviours, trust is also associated with user's loyalty [Flavian et al. 2004], which can be regarded as long-term repeat behaviour and a key component of relationship marketing.

When trying to define trust, there are a number of competing definitions and characterizations. However, one model of trust, put forward by Deutsch, accommodates a number of other trust characterizations, while providing a precise definition [Deutsch 1962]. Applied to online environments, this definition has been used as a model for trust in social networks [Golbeck and Hendler 2004] and as a core aspect of online trust [Corritore et al. 2003].

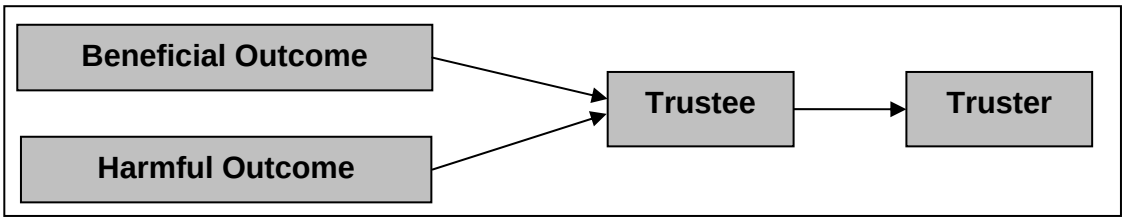

Figure 2. A Visualization of Deutsch's [1962] Trust Model

According to Deutsche's trust model, illustrated in Figure 2, the source that is trusted (the trustee), plays a brokerage role between an actor (the truster) and an object of motivational relevance (the beneficial outcome). The arrows show how the outcomes are delivered by the trustee to the truster. To follow this definition, first start with the truster who encounters a situation with two possible outcomes: beneficial or harmful. Second, to achieve the beneficial outcome—while avoiding the harmful one—the truster must depend on the trustee to deliver the desired outcome. Third, when the truster depends on the trustee to deliver the outcome, the truster enters a risky undertaking, where the harmful outcome may occur. At this point, the truster has made a trusting choice. If they avoid this course of action, they have made a mistrustful choice; However, if they have much to gain and little to lose, then this would be called gambling and would not qualify as a trusting choice [Deutsch 1962]. By this definition, when the truster possess enough confidence to predict the behaviour of the trustee, they feel they can confidently predict the outcome of the venture, and take a trusting action that implies risk [Deutsch 1958]. Online, we define *active trust* as a subject's confidence in acting on the advice of a Web site. We thus propose that:

H4: Active trust increases behavioural impact.

H5: Active trust mediates the impact of Web site credibility on behavioural impact.

Visual Appeal (Independent Variable)

Surface judgements occur when a person believes something to be credible based on a superficial inspection, such as judging a Web site to be credible because of its design. This process has been likened to judging a book by its cover [Fogg and Tseng 1999]. On the basis of design alone, users who are unfamiliar with a Web site's operator can judge that Web site to be as credible as one they are familiar with [Flanagin and Metzger 2007]. One study of Web site visual attractiveness found that, on the basis of design, users formed impressions of Web sites in just 50 milliseconds, and their first impressions contributed to a halo effect which could prevent them from observing successive threats [Lindgaard et al. 2006]. We define *visual appeal* as a Web site's superficial aesthetic attractiveness.

Examining the relationship between Web site *visual attractiveness* and credibility, researchers who blended design and credibility variables in an online investigation concluded that Web site design may have a greater impact on consumers' attitudes towards Web sites then their offline perceptions of the organizations [Long and Chiagouris 2006]. Moreover, it has been shown that design is a large factor in explaining why users can be tricked into believing criminal Web sites are legitimate [Dhamija et al. 2006]. One experiment showed that the perceived credibility of photos impacts on the perceived credibility of associated text [Nguyen and Masthoff 2007]. When visual appeal is treated as an exogenous variable (in the two-dimensional model), we propose that:

H6: Visual appeal increases Web site credibility.

V. METHODS

This paper follows two prior studies: a pilot investigation in 2006 [Cugelman et al. 2007a] and a qualitative study that aided in developing our theoretical models [Cugelman et al. 2007b]. To empirically evaluate the theoretical construct proposed in Figure 1, an online survey was advertised across a family of Web sites which composed an international anti-poverty campaign. By the end of 2007, the campaign encompassed an online network of 74 Web sites, though a smaller number opted into this study. The population defined in this project composed users of all participating campaign Web sites during the study timeframe. Without a preexisting list of users, random allocation was not possible, resulting in a convenience sample of Web site users. As a theoretical paper, this investigation is based upon a non-experimental fixed design appropriate for cross sectional correlational studies [Robson 2002].

As part of an agreement with the campaign coordinators, the online survey composed questions for this research project, as well as questions of interest to campaign members. After blending questions, the online survey was pilot tested, refined, and then finalized. Due to competition over survey space, during the pilot testing phase, multi-item constructs were reduced to the fewest, strongest measures. Afterwards, the English survey was translated by professional translators into Spanish, Portuguese, and French. To ensure the surveys captured the same meanings across languages, a process was undertaken to compare each translation, to ensure that the same questions were conceptually equal across languages. After finalizing the translations, the web surveys were deployed and then promoted to campaign webmasters. It ran from 6 November 2007 to 8 February 2008.

Where possible, the survey items were based on components of empirically validated survey instruments; however, *active trust* and *behavioural impact* were self-generated. The questions and relevant instruments are listed in the Appendix; internal consistency of survey items are presented in Table 1. Primarily, the survey used 7-point Likert-type questions and followed a number of empirical guidelines on the design of online surveys, such as presenting questions in order from easy to complex; numbering questions; providing a progress bar; using yes/no columns rather than select all; and randomizing categorical options [Dillman 2007]. Furthermore, only core questions were made mandatory.

To prepare the data, a Little's Missing Completely At Random test was run on the full 469 survey responses, resulting in (Chi=770.260, df=738, p=.199). This statistically insignificant result indicated that unanswered survey questions did not follow any systematic patterns, and consequently, incomplete records could be deleted without biasing the data [Tabachnick and Fidell 2007]. Furthermore, survey responses with less than the 10 core questions were omitted.

Afterwards, Mahalanobis distance (critical value=34.528, df=13, p<.001) and multivariate plots were used to identify multivariate outliers for removal [Tabachnick and Fidell, 2007]. Further, a manual check was undertaken to remove potentially bogus responses. Afterwards, the data set composed 237 complete records representing 41 campaign Web sites.

VI. ANALYSIS

To assess the measurement and structural models, we used Structural Equation Modelling (SEM) with AMOS 7.0. Maximum likelihood was selected as the estimation method best suited to the data, as it requires multivariate normality and is commonly used with Likert-type scales [Byrne 2001]. For this analysis, we followed the two step approach which starts by assessing, and if necessary, correcting problems with the measurement model, before the second step, assessing the structural model and its relationships [Anderson and Gerbing 1988; Blunch 2008].

Measurement Model

We first assessed the measurement model through a confirmatory factor analysis and an assessment of each variable's construct validity. During this phase, two variables (reputation and usability) did not meet the standard tests for convergent and discriminant validity. The Average Variance Extracted (AVE) of each construct was below the recommended .5 threshold [Fornell and Larcker 1981; Bagozzi and Yi 1988]. Consequently, they were removed from this investigation as the hypothesis regarding these constructs were not testable. As exogenous variables, their removal allowed us to evaluate the remaining hypothesis.

After removal, we repeated the confirmatory factor analysis and analysed the remaining variables' construct validity, shown in Table 1. To assess the convergent validity of each construct, the standardized factor loadings of each item, for their respective constructs, were above the recommended .4 [Blunch 2008] and .5 threshold [Bagozzi and Yi 1988]. Moreover, the AVE of each construct was above the recommended .5 threshold [Fornell and Larcker 1981; Bagozzi and Yi 1988], while all composite reliability scores surpassed the recommended .6 threshold [Bagozzi and Yi 1988].

Table 1. Measurement Model

Construct	Item Code	Standardized Factor Loading	AVE	Composite Reliability
Visual Appeal	VIS1 VIS2	0.784 0.874	0.689	0.816
Web Site Credibility (Trustworthy)	CRE-TW1 CRE-TW2	0.928 0.959	0.890	0.942
Web Site Credibility (Expertise)	CRE-EX1 CRE-EX2	0.85 0.937	0.800	0.889
Behavioural impact	BEH1 BEH2	0.795 0.951	0.768	0.868

All multi-item constructs, excluding the one-item measure(TRST1).

To establish discriminant validity, it is recommended that the AVE of each construct should be larger than the squared correlations between each construct [Fornell and Larcker 1981]. All constructs met these criteria. Overall, the remaining variables achieved a good level of convergent and discriminant validity; however, given that the *active trust* construct was measured on just one item, an alternative method was used to assess the validity of this single item construct. For face validity, the *active trust* was initially assessed as a sound measure. To assess discriminant validity, it has been recommended that modification indexes should be less than 3.84 [Bagozzi and Yi 1988], and for this single-item construct, the modification indexes did not suggest any cross loadings. After this process, the final confirmatory factor analysis model obtained statistically significant fit measures (Chi=28.3, df=18, p=.058). With a sound measurement model, the structural model could be assessed.

Structural Model

When specifying the structural models, for the two-dimensional model, the two credibility variables were both fixed to the same freely estimated value. The stability index of this non-recursive model was .055, which is well below the value 1, indicating that this was a stable and quantifiable model [Arbuckle 2005]. For the three-dimensional model, we allowed all credibility variables to correlate freely, as this reflects their structure in the original paper [Ohanian 1990].

To assess the models, a range of goodness of fit measures are presented in Table 2, grouped by absolute fit, relative fit, non-central chi-square test, and parsimony fit measures.

For the absolute fit measures, the chi-square test on the two-dimensional model was significant, indicating a poor fit; the three-dimensional model was insignificant, indicating a better fit with the data. When comparing the two chi-

square tests, the statistical difference between models [Chi=25.885, df=2) was significantly different at p=.001, indicating that the three-dimensional model fit the data significantly better. However, the chi-square test is known to be sensitive to sample size, and is best used in conjunction with other measures [Bagozzi and Yi 1988]. For the GFI and CFI tests, both models surpassed the .9 thresholds, indicating good fit [Blunch 2008; Bagozzi and Yi 1988]. For the noncentral chi-square test, the two-dimensional model's RMSEA score was within the range of acceptance, while the three-dimensional was much closer to the ideal score [Blunch 2008]. Finally, for the parsimony measure, both models were below the .6 threshold for acceptance, with the two-dimensional model showing a better parsimony fit [Blunch 2008]. The chi-square test indicated a better fit for the three-dimensional model, while across the other fit measures, the three-dimensional model performed marginally better.

Table 2. Goodness of Fit Measures for the Two Models

Models	Absolute Fit		Relative Fit	Non-central Chi	Parsimony
Two-Dimensional	CHI=54.190 df=20, p=.000	GFI=.952	CFI=.978	RMSEA=.085 p=.018	PRATO=.556
Three-Dimensional	CHI=28.305 df= 18 , p= .058	GFI=.974	CFI=.993	RMSEA=.049 p=.476	PRATO=.500

Hypothesis Testing

Using SEM, the regression weights and covariances for both models are presented in Figure 3. Across both models, all relationships showed significant effects, with one exception. The correlation between *expertise* and *behavioural impact* was the weakest of all relations and statistically insignificant.

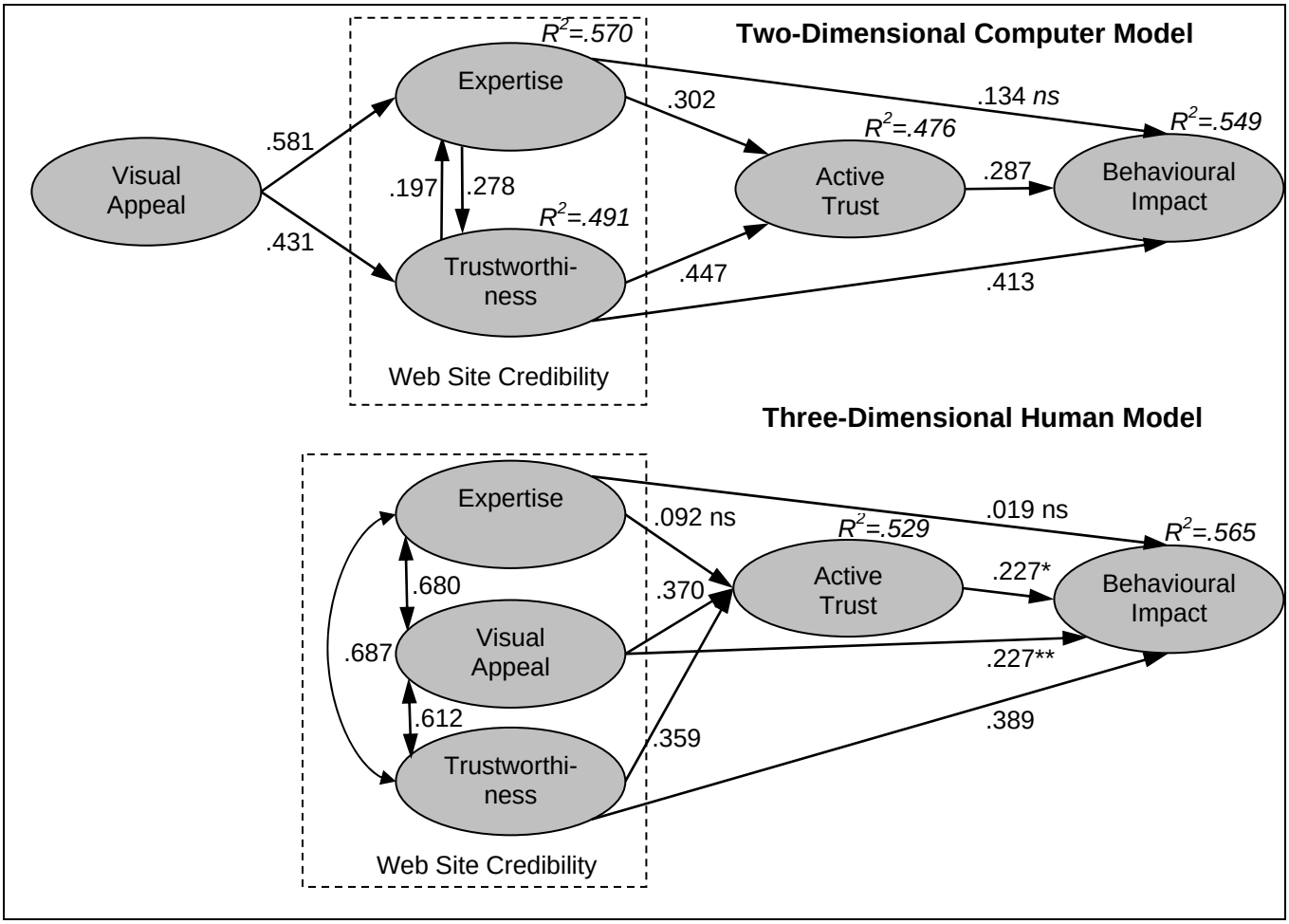

Figure 3. SEM Regression Weights and Covariance Estimates for Both Models
*All correlations significant at p<.001 except *p<.01, **p<.05, ns=not significant*

Across both models, the correlations demonstrate that perceived *trustworthiness* is more important that *expertise*, in regards to *behavioural impact*. In the three-dimensional model, *visual appeal* held a stronger correlation than

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expertise in relation to *active trust* and *behavioural impact*. This may reflect the nature of this campaign which placed more emphasis on emotional appeals, such as celebrity endorsements, graphic design, and calls to action; rather than cognitive appeals, such as the dissemination of in-depth analytical papers. Consequently, the nature of this campaign has implications for the generalizability of the findings, which will be discussed in the limitations.

To assess mediation, we calculated indirect effects on the two models with all regression weights between *Web site credibility* variables fixed to zero. We eliminated inter-credibility correlations to simplify the model, thus rendering *active trust* the only possible mediator between the *Web site credibility* variables and *behavioural impact*. *Visual appeal* was not assessed in the two-dimensional model for the sake of only examining direct mediation. Table 3 displays the standardized indirect effects which shows the effect of the credibility variables mediated through active trust onto behavioural impact. They were calculated using 2,000 bootstrap samples to estimate 90 percent confidence interval with a maximum likelihood bootstrap estimate using a two-tailed p value test.

Table 3. Standardized Indirect Effects (Constrained Credibility Variables)

Construct	Model	***Behavioural impact*** **(Constrained)**	***Behavioural impact*** **(Unconstrained)**
Expertise	Two-dimensional	.086, p<.01	P=.001
	Three-dimensional	.039 , p<.05	Not significant
Trustworthiness	Two-dimensional	.127, p<.01	P=.001
	Three-dimensional	.451, p<.05	p<.05
Visual Appeal	Two-dimensional	---	--
	Three-dimensional	.085, p<.05	p<.05

Examining the mediation, across the constrained models, *active trust* mediated a small, but statistically significant indirect effect on *behavioural impact*. The strongest mediated effect was from *trustworthiness*, with *expertise* showing a marginal mediated effect (though not statistically significant on the unconstrained model). These results indicate that *active trust* partially mediates the effect of *Web site credibility* on *behavioural impact*.

After examining the measurement model, structural model regression weights, and indirect effects, Table 4 presents an assessment of each hypothesis.

Table 4. Hypothesis Conclusions

No.	Hypothesis	Outcome
H_1	Web site credibility is a two-dimensional construct (trustworthiness, expertise) and will fit the data better than the three-dimensional construct (trustworthiness, expertise, visual appeal)	Not supported. The three-dimensional model fit the data better, which supports the alternative hypothesis
H_{2a-c}	Web site credibility increases behavioural impact	Supported across both models; however, the primary effect was through trustworthiness with expertise proving insignificant in the three-dimensional model
H_{3a-c}	Web site credibility increases active trust	Supported, but with the primary effect is through trustworthiness and visual appeal being relevant in the three-dimensional model
H_4	Active trust increases behavioural impact	Supported across both models
H_5	Active trust mediates the impact of Web site credibility on behavioural impact	Somewhat supported. Active trust contributes a partial mediating effect
H_{6a-b}	Visual appeal increases Web site credibility	Supported in the two-dimensional model, but not a valid hypothesis for the three-dimensional model

These results are subject to a number of limitations. For the Web survey, it was not possible to draw a random selection and self selection may have introduced bias. Although efforts were made to ensure cross language comparability among the four surveys, different translations may have introduced some distortions. The *active trust* construct was measured with a single item, and would have benefited from a multi item measure. The constituents

of advocacy campaign Web sites may differ from the constituents targeted by other campaigns, and generalizability may be limited to participants of this type of campaign, rather than the audiences of other initiatives, such as public health or safety campaigns. As a correlational study, this research can only indicate relationships between variables, but not cause and effect relationships that are better assessed with experimental methods.

VII. THEORETICAL IMPLICATIONS

In this investigation, the three-dimensional model of human credibility better fit the data than the computer credibility model. Theoretically, these finding may be explained by the media equation [Reeves and Nass 2003] and the functional triad [Fogg 2003], which propose people interact with computers and media in ways similar to how they interact with people. Examining Web site interaction from the perspective of human credibility may help explain other online phenomenon, such as the fact that that most people can be fooled into believing bogus (criminal) Web sites are trustworthy, to a large extent on the basis of visual clues [Dhamija et al. 2006]; and that people change their perceptions of text credibility on the basis of how they rate the credibility of associated photographs [Nguyen and Masthoff 2007].

Given the partial mediating role of *active trust*, we propose the models in this paper have application to social exchange theory. For example, online, these frameworks can account for the hidden risk-based costs associated with Internet transactions. Expressing this notion in the language of social marketing, if hidden risk-based costs are ignored, then the price of participation may inflate to levels that citizens consider too expensive. Lower *Web site credibility* may decrease *active trust* and *behavioural impact* by introducing added barriers, prices, obstacles or risk-based costs. Conversely, higher credibility Web sites could represent lower-risk options, where advocated behaviours are perceived as more reliable, thus lower-cost. Moreover, from the point of view of relationship marketing, where long-term repeat user behaviour is influenced by trust, *Web site credibility* can be seen as a key factor in the formation of user trust and potential long-term behavioural maintenance.

The level of risk is likely to moderate the impact of *Web site credibility* on *active trust* and *behavioural impact*, where higher-risk transactions (such as making a financial donation) may require more trust than lower-risk transactions (such as signing an online petition). Online risk is associated with online trust [Corritore et al. 2005], willingness to buy from an online store [Jarvenpaa et al. 2000] and behavioural intent, with different Web site categories holding different types of risks [Bart et al. 2005]. Consequently, depending on the type and level of risk (such as financial, confidentiality, or information risks), it is likely that trust will be more or less relevant to online engagement.

VIII. PRACTITIONER IMPLICATIONS

For social marketers, pre-campaign research is called formative research; this is the point where problems are identified, target audiences are considered, solutions are examined and intervention materials are tested. Our findings suggest that *Web site credibility* and *active trust* factors should be addressed during the early campaign planning phases to increase the probability that target audiences find the campaign's messages believable, safe and motivating. The following suggestions show how the findings in this paper may be applied to online social marketing campaigns.

First, since Web site users may conceptualize campaign Web sites (in part or whole) as the credible source, it may be useful to conceptualize Web sites in human terms and model online campaign interactions on human-like relationships. For example, a healthy-eating campaign may provide facts and diet tools, but it may also model these features on relationships between the target audiences and a health specialist, ideally one who is a good match for that target audience. Likewise, an active living Web site may consider adopting the disposition of a motivating and charismatic coach.

Second, during the formative research phase, investigators can use the three dimensions of credibility (trustworthiness, expertise, and visual appeal) as a simple framework to guide research on online credibility. As credibility is regarded as a perceived quality, it should shift according to each target audience and campaigning context. Consequently, for each intervention, we suggest that target audiences should be the ultimate judges of what constitutes a credible and trustable online campaign.

Third, when designing interventions, online content should, where appropriate, demonstrate the campaign's *expertise* and *trustworthiness*. At the same time, these factors must be conveyed through a visual language relevant to the target audiences. Given two campaigns of equal substance, our research suggests the better packaged online campaign would outperform its uglier rival. Thus, *visual appeal* should not be underestimated, but rather, used as a vehicle to express a campaign's core messages, credentials and other motivational factors.

Fourth, this paper has not discussed specific design factors that are associated with *Web site credibility* (such as colour, layout, editorial style, etc…). Nonetheless, detailed credibility factors should be addressed during the formative research phase by consulting existing literature on the subject and seeking feedback directly from target audiences through market testing.

Fifth, the correlations in this study do not show that *Web site credibility* and *active trust* cause *behavioural impact*, but rather, that there is an association between these variables. Research on this topic suggest that *Web site credibility* and *active trust* can only impact the effect of an already existing motivational appeal. Clearly, *Web site credibility* and *active trust* should not be misinterpreted as motivational appeals; but rather, they should be treated as factors that may modify motivational appeals. For example, a credible source who makes no motivational appeal cannot have any impact on any audience; while the impact of a motivational appeal may be modified by the credibility of the source. Consequently, credibility factors alone should not be seen as a substitute for sound campaign appeals.

Sixth, to outperform online competition and competing behaviours, it is possible to stand out by having a more credible and trustable online campaign than the competitors. Conversely, the same factors used to design credible appearing campaigns can be leveraged to undermine the credibility of competitors' campaigns. While some social marketing campaigns have focused on undermining the credibility of competitors, such as Florida's Truth Campaign (discussed in the conclusion), our research did not address third-party portrayals. Although the three dimensions could be used to design discrediting attacks, this study has not examine third-party effects of discrediting.

IX. CONCLUSIONS

In this paper, we discussed two growing trends that threaten to undermine online social marketing interventions: mistrust and competition. As social marketers move online, we propose that risks constitute hidden prices/costs that can reduce the impact of behavioural change interventions. Likewise, growing competition means that target audiences are faced with mixed messages and may not be able to judge credible sources that offer reliable advice.

As a solution, we proposed that Web site credibility and active trust can help remedy these two problems. We presented and evaluated two model of Web site credibility. Our findings suggested that *Web site credibility*, which is traditionally based on the two-dimensional (*expertise, trustworthiness)* model of computer credibility may not be as appropriate to campaign Web sites as the three-dimensional (*expertise*, *trustworthiness, visual appeal)* model. Our findings also suggest the *active trust* partially mediates the effect of *Web site credibility* on *behavioural impact*, while *Web site credibility* also holds a significant direct effect on *behavioural impact*. This suggests that *Web site credibility* is a key component in online behavioural change interventions.

Our results suggest that, just as campaigners seek credible persons who hold the public's trust as a way of boosting campaign performance, and e-commerce Web sites seek to develop trustable Web sites to boost online sales, more credible Web sites can help campaigners achieve greater engagement. Moreover, as trust is a core component of social exchange theory which manifests in the 4Ps, we propose that online campaigns include risk-based costs as hidden price factors and that Web site credibility factors be shaped to increase trust formation.

Within our study, we did not examine the potential impact of counter-credibility campaigns. For example, Florida's Truth Campaign was unique among campaigns for its aggression against the tobacco industry, charging them with misinforming the public for commercial gain. For future research, it would be interesting to assess if online counter-credibility campaigns could reduce behaviours, such as mistrust in the tobacco industry resulting in less smoking, or whether medical doctors debunking the claims of pro-anorexia Web sites would have an impact on anorexic behaviour. Another avenue of research would be to explore the relationships between *Web site credibility*, *active trust*, and *behavioural impact* in experimental settings where the correlations in our research could be assessed more confidently. Finally, since many social marketing campaigns aspire to achieve long-term *behavioural impacts*, there is scope to explore how *Web site credibility* can contribute to forming trust and long-term relationships that could lead to long-term behavioural maintenance.

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APPENDIX

Survey Questions and Item Codes			
Construct	**Item Code**	**Item Statements**	**Source**
Visual Appeal	VIS1 VIS2	• This Web site's visual appearance is: (Very Unattractive-Very Attractive) • This Web site looks professionally designed. (Agree-Disagree)	Lindgaard et al. [2006]; Long and Chiagouris [2006]
Web Site Credibility (Trustworthy)	CRE-TW1 CRE-TW2	• Information on this Web site seems: (Untrustworthy-Trustworthy) • Also, information on this Web site seems: (Unreliable-Reliable)	Ohanian [1990]
Web Site Credibility (Expertise)	CRE-EX1 CRE-EX2	• Content on this Web site reflects authors who are: (Not Experts-Experts) • Also, content on this Web site reflects authors who are: (Unknowledgeable-Knowledgeable)	Ohanian [1990]
Active Trust	TRST1	• If I were to act on the advice of this Web site, I would feel: (Unconfident-Confident)	Self designed
Behavioural impact	BEH1 BEH2	• Because of this Web site, I am more willing to support this campaign in the future. (Agree-Disagree) • This Web site has inspired me to do more for the White Band Campaign. (Agree-Disagree)	Self designed

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