Original Article

Prototypes versus examples: A new model of online credibility for commercial websites

Received (in revised form): 6th November 2009

Gianluigi Guido

holds a PhD from the University of Cambridge (UK); and is Full Professor of Marketing at the Faculty of Economics of the University of Salento, Lecce (Italy) and Professor of Marketing Research and Analyses at the Faculty of Economics of the LUISS University of Rome. He has written ten books and as many chapters in edited books. His books in English include *The Salience of Marketing Stimuli*, Boston: Kluwer, 2001; and *Readings in Global Marketing* (eds. M.R. Czinkota and I.A. Ronkainen, London: Dryden Press, 1995). He has published more than 100 articles in national and international journals such as the *Journal of Consumer Marketing*, the *Journal of Satisfaction, Dissatisfaction & Complaining Behavior*, the *Journal of Economic Psychology*, the *Journal of Euro-Marketing*, the *Journal of Product and Brand Management*, *Long Range Planning*, *Recherche et Applications en Marketing*, and *Research Policy*.

M. Irene Prete

holds a PhD in *Economics and Quantitative Methods for Market Analysis* from the University of Salento (Lecce, Italy) and is Research Associate of Marketing and Territorial Marketing at the same university, as well as of Marketing Research and Analyses at the Faculty of Economics of the LUISS University of Rome. She also holds a Science Master (Master Recherche) in Management (Science de Gestion), with a specialization in Marketing, from the Ecole Doctorale Economie, Gestion et Espace at the University of Paris XII (France). Her publications in English include *Computer-Mediated Relationships and Trust* (eds. L.L. Brennan and V.E. Johnson), New York: Hershey, 2008; and some articles in international journals, in particular the *Journal of Targeting, Measurement and Analysis for Marketing* and *Advances in Management*.

Luigi Sammarco

holds a *laurea* in Business and Management, with a major in Marketing, from the Faculty of Economics of the University of Salento, Lecce (Italy), where he is Research Assistant in Marketing.

ABSTRACT This study introduces a new model of *credibility for websites*: graphical interfaces, functioning as bi-directional channels of communication that enable both users and computers to communicate. In the proposed model, *website credibility* is based on (i) *Context of fruition*: situational factors and internal characteristics of users, measured by level of *involvement* (Zaichkowsky, 1994); (ii) *Stimuli*: inputs that attract the attention of users as interpreted through their memory *schemata*. These enable users to generate *prototypes* – representative models of a particular membership category – and *examples* – imitative models of a membership category; and (iii) *Mental schemata*: unconscious cognitive representations, based on knowledge structures. These enable one to differentiate between users who are *experts* – individuals who possess these schemata – and those who are *novices* – individuals who do not (Guido, 2001). Results obtained from two experimental studies showed that *credibility* should not be considered an objective characteristic ascribed to its source, but a subjective one, deriving from users' cognitive and motivational processes.

Journal of Targeting, Measurement and Analysis for Marketing (2010) 18, 3–16. doi:10.1057/jt.2009.25;

published online 11 January 2010

Keywords: online marketing; online credibility; congruity theory; involvement; prototypes versus examples

Correspondence: Gianluigi Guido

Università del Salento, Palazzo Ecotekne, Via per Monteroni,
73100 Lecce, Italy

E-mail: gianluigi.guido@unisalento.it

INTRODUCTION

Internet and, specifically, *websites* – to be precise, graphical interfaces that function as bi-directional channels of communication that enable both users and computers to communicate¹ – possess distinctive characteristics, such as anonymity, interactivity and ease of content publication,² all of which have a strong influence on their use. On the positive side, websites and pages enjoy the advantages of other channels of mass communication, contributing to *one-to-many* communications. This is because the information and services they contain are not only directed towards a specific individual or organization, but are also open to anyone who happens to access them for whatever reason.³ They also represent a popular means of diffusing knowledge, making it possible to obtain information on any subject, company or organization, and enabling businesses to develop trust-based relationships with their clients.⁴ On the negative side, websites enable individuals and organizations to disguise their own identities, and by requesting users' personal information relating to the services that they provide expose them to a resulting risk of loss of privacy. Furthermore, businesses may use websites to publish distorted or false information, if not deliberately build bogus websites and send out fraudulent advertising messages. Such abuses of the medium are becoming so frequent that both the Securities and Exchange Commission – the US governmental authority that regulates security markets and defends investors – and the Federal Trade Commission – the US agency that promotes 'consumer protection' and competition in the economic field – have created trap sites in order to educate users on the existence of *online* frauds and encourage them to be more selective when choosing Internet content.² Thus, websites need to be above all credible. This is vital not only to users, who require useful services and accurate information, but also to companies and organizations whose main concern is to generate transactions and revenues, communicate their image, attract new customers and clients, and obtain information about them by persuading them to participate in opinion polls and surveys.^{2,3,5–7}

The aim of this study is to introduce a new model of website credibility, in which credibility is seen not as an objective characteristic ascribed to its source, but as a subjective element deriving from cognitive and motivational processes that users employ while interacting with a given website. These will vary according to the users' individual characteristics, their perceptions, their elaboration of information, and the specific context of the interaction.

WEBSITE CREDIBILITY AND ITS DIMENSIONS

Analysis on the construct of credibility, dating back to Aristotle's studies on *ethos* and on the ability of persuasion, was deepened by Hovland *et al*⁸ in their seminal work and subsequent studies in the field of communication studies.^{9,10} *Source credibility* is traditionally defined as a multidimensional construct, an intrinsic characteristic ascribed to the message sender, who is supposed to have a profound knowledge of a specific theme (*expertise*). The sender of the message is reliable (*trustworthiness*), as it is accurate about a particular subject, and desirable (*attractive*), as it leads to a process of identification.^{9–11} As regards websites and, specifically, e-commerce websites, numerous studies demonstrate that trust influences online purchase behavior.^{5,12–14} Notwithstanding the fact that trust and credibility are interchangeable constructs, they are, in fact, different⁶: trust can be defined as the ability of one party (*trustee*) to maintain and meet its obligations to a particular counterpart (*trustor*), and behave according to the latter's expectancies.¹⁵ As regards human–computer relations, trust refers to dependability, whereas credibility refers to believability.⁶ Website credibility is determined by several factors,¹⁶ such as impartiality, accuracy, completeness, privacy, professionalism, clarity and reliability, which are related to the dimensions of *attractiveness*, *expertise* and *trustworthiness*.^{6,17–19}

Expertise. A website can be considered expert when it facilitates straightforward interaction on the part of both skilled users and novices, when it shows usefulness and user-friendliness. Expertise

is connected with knowledge because a source can have influence on the basis of previous experience.¹⁷ Expertise is determined by (i) the use of up-to-date, complete, accurate and multi-language contents; (ii) the existence of criteria for the selection of information; (iii) a complete list of citations and references; and (iv) the indication, for each article, of opinions, ratings and reviews from users.^{2,20–23} Website *expertise* is also related to the *reduction of errors*, that is, the capacity to reduce potential slips and mistakes – such as typographical errors, technical problems and broken links – and their effects.^{2,20,23,24} Expertise is also influenced by ease of comprehension – that is, the capacity to reduce the effort of information retrieval in memory to a minimum, by activating automatic processes of action and recognition¹⁹ – and the ease of a task – that is, the capacity to facilitate website interaction. The latter is furthered by both the clear organization of the information provided in websites and the provision of navigation tools such as map sites.^{20,21,24} Furthermore, website expertise is connected with the speed of response, which can affect users' perceptions of the content quality,²⁵ its relevance²⁶ and the security of transactions, as in the case of e-commerce websites.²⁷

Trustworthiness. Websites display signs of *trustworthiness* when they give users a clear and immediate idea of their content and purposes, presenting themselves in a definite and transparent manner.^{17,19,28,29} Dimensions of trustworthiness include the presence of credentials – that is, the easy identification of the website's owners together with their addresses, e-mail addresses or telephone numbers, enabling users to contact them without effort,^{2,20,23,24} and, for companies or institutions, the use of a URL (Uniform Resource Locator) identifiable with their names. Recommendations for a website are another element. These may include advice or promotion by the media (newspapers, magazines, e-mail newsletters), from reliable others^{20,22} or by reputation systems³⁰ – a website area in which users have the opportunity to insert their feedback, perceptions and experiences – or a link with a credible site.²⁰ These are particularly useful

for e-commerce websites, as they enable users to evaluate the credibility of the parties involved in the transactions.^{3,31} One important factor determining trustworthiness is the careful use of advertising. The excessive use of automatic pop-up windows and the presence of invasive advertising that is inseparable from contents generally reduces website credibility,^{2,20,24} whereas message ads, consistent and connected with the information contained in the website and derived from trusted sources, add to website credibility. Another factor is the presence of help guides, providing users with adequate assistance, enriching their learning experience and reducing the mental effort required on their part.²⁰

Attractiveness. Users evaluate website credibility mainly by considering aspects linked to attractiveness and appearance,^{2,3,16,20,32,33} because, when surfing the Internet they tend to rapidly adopt interactive behavior. They move quickly from one page to another, lingering if they are pleased by the visual aspect; otherwise they abandon the website and search for other sources of information or services.^{20,34} A website shows *attractiveness* when it manages to immediately capture the attention of the users, stimulating emotional and instinctive responses, through the use of colors, images, attractive design and animation.^{18,19} The dimensions of website *attractiveness* are as follows: (i) *esthetics*, which refers to website design and various factors, such as visual representation of objects, image quality, elegance,¹⁹ visual layout, the use of appropriate colours^{32,35} and testimonials from well-known people³⁶; and (ii) *seduction*, which refers to the capacity to persuade users through graphical interfaces,¹⁸ interactive mechanisms, and the provision for personalized and memorable experiences, for example involving users by means of *entertainment* (games, interactive storytelling, cartoons).³⁷

AIM AND OBJECTIVES

The aim of this study is to propose a new model of website credibility. Notwithstanding the fact that some seminal studies have considered credibility a perceived characteristic, which is dependent on audience attributes¹⁰ and on users'

characteristics,² these studies have continued to define credibility as an objective characteristic ascribed to its source, measured through the dimensions of *trustworthiness*, *expertise* and *attractiveness*. In the proposed model, credibility is considered not as an absolute characteristic, but as deriving from the cognitive and motivational processes that users activate when surfing the Internet and searching for information on websites.

THE MODEL

In the proposed model, *website* credibility is based on (i) *Context* of fruition – users' internal characteristics and situational factors – measured through their level of involvement³⁸; (ii) *Stimuli* – inputs attracting users' attention interpreted by means of their memory *schemata* – which enable users to generate *prototypes* – representative models of a particular membership category – and *examples* – imitative models of a membership category; and (iii) *Mental schemata* – unconscious cognitive representations, based on knowledge structures obtained through past experiences, inferences or external communication – according to which it is possible to differentiate between users who are *experts* – individuals who have access to these schemata – and those who are *novices* – individuals without these schemata.³⁹

The proposed model is based on the following three axioms.

Axiom 1: Credibility depends on the context of fruition.

Context of fruition has a double meaning: in a strict sense, it represents the physical environment in which the stimulus occurs, and it can be described as various potential stimuli (that is, *banner ads*, sounds, images), which can be perceived in different manners (*backgrounds*); in an ample sense, it includes both *personal factors* – users' internal characteristics, such as motivations (objectives, interests), life style, personality and attitudes – and *situational factors* – physical environmental characteristics, including stimuli (competent stimuli, connected events), and temporary characteristics specific to the user, such as mood, stress level and amount of time that

they have at their disposal. The context of fruition has a double role: (i) it encourages the perception of a stimulus figure, which consists of a series of qualitative stimuli (brightness, movement, sound and image³⁹); and (ii) it activates users' schemata, as it varies according to the particular context in which the stimulus takes place.⁴⁰

Axiom 2: Website credibility (stimulus) is not an objective attribute.

Credibility cannot be defined as an absolute characteristic of a specific website, but rather as a perceived attribute¹⁰ depending on the perception process activated by the user, the context of stimuli fruition and the user's mental scheme. When individuals evaluate a particular stimulus, they search for a cognitive network in order to identify any type of knowledge that may prove significant and useful for the elaboration of new information. By activating this relevant scheme, which depends on the context of perception, individuals try to match particular elements of the stimulus elements with those associated with stored schemata. A website (*figurative stimulus*) is considered credible when it is able to influence users simply at a pre-conscious level, while the perceived incongruity between a stimulus in a particular context and users' schemata allows them to determine credibility.

Axiom 3: Credibility depends on users' mental schemata.

Website credibility depends on users' roles and on their personal experiences based on the schemata activated through the perception of context. *Mental schemata* are unconscious cognitive representations, which consist of knowledge structures, obtained through past experiences, including expectations regarding the possible relationships between the stimulus (for example, the website) and previously created categorical organizations (users' schemata).³⁹ Different users could assign divergent meanings to the same stimulus, as their perceptions are influenced by their personal expectations and

mental schemata, which may also derive from individual elaboration of information.

The following three propositions were identified.

Proposition 1: A website (in general, the stimulus), taken as an example, is arguably to be considered credible if there is congruency with the user's scheme (prototype).

Users receive stimuli – input that attracts their attention, and that is interpreted by means of their storage in memory – that allow the creation of (i) *prototypes*, which correspond to representative models of particular membership categories (that is, a commercial website), which command credibility. Prototypical characteristics can be stored by website users in their memory, allowing comparison – during the interaction – with other websites; and (ii) *examples*, which correspond to imitative models of the membership category in question. This proposition states that credibility increases if the stimulus (website), taken as an example, is *congruent* with – similar to – users' prototypes (mental scheme), and if the initial judgement attributed to the prototype is positive.

Proposition 2: Involvement is a moderating variable of credibility.

In the new model of credibility, the influence of context is measured by means of *involvement*, a motivational state deriving from intrinsic and situational sources connected to previous knowledge, clues and contingencies. It influences quantity, direction, focus of attention, intensity and efforts at comprehension during the interpretation phase.³⁹ If users are highly involved by the website's prominent stimuli, they will pay more attention to figures and any verbal stimuli, so long as these are contextually congruent with their mental schemata.

Proposition 3: Comprehension (evaluated through the use, distinguishing between experts and novices) is a moderating variable of credibility.

Consideration of different users' mental schemata can be accomplished by evaluating their level of *comprehension* – the capacity to minimize the processes of information restoration in memory. In effect, a scheme becomes *active* only in certain contexts,⁴⁰ when it is caused – consciously or unconsciously – by an external stimulus. A scheme is *accessible* when individuals are ready to elaborate it, as it is stored in memory. Furthermore, a scheme is *available* when particular knowledge structures can be used for the evaluation of stimuli. The availability of schemata allows differentiation between individuals that have access to these schemata – *experts* – and individuals who do not – *novices*. *Experts* usually pay attention to relevant and congruent clues, whereas *novices* entertain inappropriate and incongruent clues. *Experts*, in the presence of numerous stimuli (that is, websites), are better able than *novices* to evaluate the level of congruence of models considered as examples; furthermore, they are better able to attribute high credibility to models (examples) that are more congruent with their prototype.^{29,41}

Three levels of experimental investigation have been used in order to test the three theoretical propositions above.

Hypothesis 1: Credibility of a website taken as an example increases if there is congruence with users' mental schemata (prototype).

The first experimental level is related to the First Proposition: the level of congruence of the two websites (stimuli) taken as examples in comparison with the website considered as prototype have an influence on credibility, if the initial judgement of the prototype is positive.

Hypothesis 2: Perception of credibility increases when the level of involvement increases.

The further experimental level is related to the Second Proposition: involvement is an antecedent and a possible moderator variable of credibility. Therefore, Hypothesis 2 aims to test whether the level of involvement heightens the perception of credibility.

Hypothesis 3: Perception of credibility increases when the level of comprehension increases.

The last hypothesis is related to the Third Proposition: according to it, the activation, accessibility and availability of schemata are antecedents and possible moderator variables of credibility. The third hypothesis posits that *comprehension* (that is, availability of schemata) increases the credibility perception of the user. This hypothesis maintains that credibility evaluation of expert users is higher than that of novice users, because the former can better evaluate levels of congruence.

METHODOLOGY

Causal and quantitative research was conducted, using an experimental factorial design (see Table 1) in order to determine the nature of relations between independent and dependent variables. The study was conducted on a sample of 240 Italian students from the Faculty of Economics and the Faculty of Languages and Foreign Literatures at the University of Salento, Lecce (Italy) – divided into 88 males and 152 females, grouped into three age groups: 18–22 years (114), 23–27 years (110) and over 27 years (16). Notwithstanding the fact that some studies have highlighted that such a sample is inadequate and does not allow researchers to generalize results, its use is consistent with the majority of consumer and marketing studies, in which students are used as surrogates of other populations.⁴² Furthermore, the choice of this sample can also be considered appropriate with regard to the fact that, according to Eurostat, approximately 80 per cent of young people (aged

16–24) use the Internet habitually. In contrast, 54 per cent of those aged 25–54 and only 20 per cent of those aged 55–74 do the same.⁴³

Two different studies were carried out, using e-commerce websites specializing in the online sale of books, selected according to the interests of the sample in question. In Study 1, the Amazon website (www.amazon.com) – chosen as a *prototype* (that is, as a representative model of the commercial website category) – was compared with the Barnes & Noble website (www.bn.com) – considered a good example of the same category; in Study 2, the Amazon website – the *prototype* – was compared with another *example* of the same category – the Mondolibri website (www.mondolibri.it).

The experiment was conducted in a laboratory, in an artificial environment in which desired conditions were created: the questionnaire was administered in a location where participants had access to a computer connected to the Internet, allowing them to interact with the websites in question. The questionnaire included (i) level of *involvement*, using the Zaichkowsky³⁸ PIIA (*Personal Involvement Inventory for Advertising*) scale; (ii) level of *comprehension*, by means of 14 items considering knowledge of Transfer Computer Protocol/Instruction Pointer, execution of digitalisation based on Optical Character Recognition, and the use of a system of videoconferencing, such as *NetMeeting*; (iii) *prototypicality*, measured by testing participants' recognition of the prototypical website of the considered category (*If you think about a website selling books on the Internet, which website do you think about? If it is not Amazon, end the interview*), and *congruence* of websites, obtained by asking participants for an evaluation of the congruence of specific websites with the considered category (*Do you know other websites selling books on the Internet? Could you give their names? If they are not Barnes & Noble or Mondolibri, end the interview*); (iv) interaction with the three websites in question, namely, Amazon, Barnes & Noble and Mondolibri; (v) evaluation of *direct credibility*, by means of a 7-point Likert scale (*How credible do you consider this website to be?*), and of *indirect credibility*, by using the

Table 1: The experimental design

Level of congruence	Level of involvement	Level of comprehension	
		Experts	Novices
High congruence	High involvement	30 ss.	30 ss.
	Low involvement	30 ss.	30 ss.
Low congruence	High involvement	30 ss.	30 ss.
	Low involvement	30 ss.	30 ss.

ss.=subjects.

Ohanian scale,¹¹ based on *trustworthiness*, *expertise* and *attractiveness*; and (vi) sociodemographic data.

The following independent variables were considered: (i) the level of *congruence*: as measured by a 7-point Likert scale, subjects who assigned a value from 1 to 4 were classified as having a low congruence, while those who assigned a value from 5 to 7 were classified as having a high congruence; (ii) the level of *involvement*: as measured by a 7-point Likert scale containing 10 items³⁸ with a median value of 52, subjects assigning a value from 10 to 52 were classified as less involved and subjects with values from 52 to 70 were classified as more involved; and (iii) the level of *comprehension*: as measured by means of a 2/3-point scale (median 32), subjects having a value from 14 to 32 were classified as novices, and those having a value from 32 to 36 as experts. Direct credibility of the three websites in question was the dependent variable, whereas indirect credibility was used to test whether the initial judgement of the prototype – Amazon – was positive, and to evaluate the websites taken as examples – Barnes & Noble and Mondolibri.

ANALYSIS AND RESULTS

Study 1: Credibility of the Barnes & Noble website (example) in comparison to the Amazon website (prototype)

The initial judgment of Amazon (*prototype*) was calculated, considering the mean value of direct credibility and the coefficient of correlation between the direct and indirect credibility of the Amazon website. The mean value of the direct credibility of the Amazon site is 5.35, thus obtaining a positive evaluation. Table 2 shows that the correlation between the direct and indirect credibility of Amazon is 0.605, with a P -value (sig.) < 0.001 . By calculating the square

of the coefficient, it is possible to obtain the percentage of common variance between direct and indirect credibility, which is 36 per cent ($0.605^2 = 0.36$).

The correlation between the direct credibility of the Amazon website and the dimensions of the same construct measured indirectly was calculated, adding the 15 items of Ohanian's scale¹¹ related to the three dimensions of *attractiveness*, *expertise* and *trustworthiness*. Table 3 shows that all dimensions are correlated.

The same analysis was carried out for the Barnes & Noble website. Table 4 shows that the correlation between the direct and indirect credibility of the Barnes & Noble site is 0.439, with a P -value (sig.) < 0.001 . The correlation coefficient of the Barnes & Noble site is less than that of Amazon, even if it is still positive. By calculating the square of the coefficient, it is possible to obtain the percentage of common variance between direct and indirect credibility, which is 19.2 per cent ($0.439^2 = 0.19$).

The correlation between the direct credibility of Barnes & Noble and dimensions of the same construct measured indirectly was calculated. Table 5 shows that all the dimensions are correlated.

In order to test *Hypotheses 1, 2 and 3*, three ANOVA were conducted (see Tables 6–8). The results obtained (*Congruence*: $F = 29.442$, P -value < 0.001 ; *Involvement*: $F = 5.178$, P -value = 0.024; *Comprehension*: $F = 4.008$, P -value = 0.044) show that a difference exists between the mean

Table 2: Correlation between direct and indirect credibility of the Amazon website

	Direct credibility	Indirect credibility
Pearson correlation	1.000	0.605
Sig. (one-tailed)	—	0.000
N	240	240

Table 3: Correlation between direct credibility and dimensions of indirect credibility of the Amazon website

	Direct credibility	Attractiveness	Trustworthiness	Expertise
Pearson correlation	1.000	0.234	0.574	0.629
Sig. (one-tailed)	—	0.000	0.000	0.000
N	240	240	240	240

value of direct credibility, and thus that the null hypothesis can be rejected. This demonstrates that users' congruence between websites tends to transfer credibility from the prototype to the example, and that users' involvement and comprehension augment their perception of credibility.

A test of between-subject effects was carried out: Table 9 shows that *test F* of interaction between the independent variables – the level of

congruence, comprehension and involvement – is not significant (P -value = 0.40), and thus the variables do not show any interaction.

Study 2: Credibility of the Mondolibri website (example) in comparison to the Amazon website (prototype)

The correlation between the direct and indirect credibility of the Mondolibri website was measured: Table 10 shows that it is equal to 0.502, and that it has a significant P -value < 0.001 . By considering the square of the coefficient, it is possible to obtain the percentage of common variance between indirect and direct credibility, namely, 25.2 per cent ($0.502^2 = 0.252$).

Table 11 shows that the direct credibility of the Mondolibri website and the three dimensions

Table 4: Correlation between direct and indirect credibility of the Barnes & Noble website

	Direct credibility	Indirect credibility
Pearson correlation	1.000	0.439
Sig. (one-tailed)	—	0.000
N	240	240

Table 5: Correlation between the direct credibility and dimensions of indirect credibility of the Barnes & Noble website

	Direct credibility	Attractiveness	Trustworthiness	Expertise
Pearson correlation	1.000	0.299	0.391	0.442
Sig. (one-tailed)	—	0.000	0.000	0.000
N	240	240	240	240

Table 6: Direct credibility and the level of congruence of the Barnes & Noble website

Level of congruence	Mean (μ)	Standard deviation (δ)	ANOVA	
			F	P
Low congruence	4.473	1.329	29.442	0.000
High congruence	5.308	0.975		
Total	4.845	1.253		

Table 7: Direct credibility and level of involvement of the Barnes & Noble website

Level of involvement	Mean (μ)	Standard deviation (δ)	ANOVA	
			F	P
Low involvement	4.679	1.284	5.178	0.000
High involvement	5.045	1.189		
Total	4.845	1.253		

Table 8: Direct credibility and level of comprehension of the Barnes & Noble website

Level of comprehension	Mean (μ)	Standard deviation (δ)	ANOVA	
			F	P
Novices	4.683	1.353	4.088	0.000
Experts	5.008	1.126		
Total	4.845	1.253		

Table 9: Tests of between-subject effects for the Amazon and Barnes & Noble websites

Source	Type III sum of squares	DF	Mean square	F	Sig.
Corrected model	60.497(a)	7	8.642	6.369	0.000
Intercept	5323.772	1	5323.772	3923.505	0.000
LcomprN	2.471	1	2.471	1.821	0.178
L.involv.2	8.723	1	8.723	6.428	0.012
Lcongr.1	44.794	1	44.794	33.012	0.000
LcomprN*L.involv.2	0.571	1	0.571	0.421	0.571
LcomprN*Lcongr.1	3.042	1	3.042	2.242	0.136
L.involv.2*Lcongr.1	0.442	1	0.442	0.326	0.569
LcomprN*L.involv.2*Lcongr.1	0.964	1	0.964	0.710	0.400
Error	314.799	232	1.357	—	—
Total	6011.000	240	—	—	—
Corrected total	375.296	239	—	—	—

$R^2=0.161$ (adjusted $R^2=0.136$)

Note: LcomprN=level of comprehension; L.involv.2=level of involvement; Lcongr.1=level of congruence of Barnes & Noble and Amazon; LcomprN*L.involv.2=Interaction effect between the level of comprehension and the level of involvement; LcomprN*Lcongr.1=Interaction effect between the level of comprehension and the level of congruence; L.involv.2*Lcongr.1=interaction effect between the level of involvement and the level of congruence; LcomprN*L.involv.2*Lcongr.1=interaction effect between the level of comprehension, the level of involvement and the level of congruence.

Table 10: Correlation between direct and indirect credibility of the Mondolibri website

	Direct credibility	Indirect credibility
Pearson correlation	1.000	0.502
Sig. (one-tailed)	—	0.000
N	240	240

of the same construct are positively correlated, with a high level of significance.

As in the previous study, the test of *Hypotheses 1, 2 and 3* was affected by means of three ANOVA (see Table 12–14). The results obtained (*Congruence*: $F=61.172$, $P\text{-value}<0.001$; *Involvement*: $F=6.555$, $P\text{-value}=0.011$;

Table 11: Correlation between direct credibility and dimensions of indirect credibility of the Mondolibri website

	Direct credibility	Attractiveness	Trustworthiness	Expertise
Pearson correlation	1.000	0.419	0.486	0.441
Sig. (one-tailed)	—	0.000	0.000	0.000
N	240	240	240	240

Table 12: Direct credibility and level of congruence of the Mondolibri website

Level of congruence	Mean (μ)	Standard deviation (δ)	ANOVA	
			F	P
Low congruence	3.984	1.799	61.172	0.000
High congruence	5.557	1.231		
Total	4.725	1.740		

Table 13: Direct credibility and level of involvement of the Mondolibri website

Level of Involvement	Mean (μ)	Standard deviation (δ)	ANOVA	
			F	P
Low involvement	4.465	1.785	6.555	0.011
High involvement	5.036	1.638		
Total	4.725	1.740		

Table 14: Direct credibility and level of comprehension of the Mondolibri website

Level of comprehension	Mean (μ)	Standard deviation (δ)	ANOVA	
			F	P
Novices	4.358	1.868	11.104	0.001
Experts	5.091	1.522		
Total	4.725	1.740		

Table 15: Tests of between-subject effects for the Amazon and Mondolibri websites

Source	Type III sum of squares	DF	Mean square	F	Sig.
Corrected model	228.505(a)	7	32.644	15.289	0.000
Intercept	5243.975	1	5243.975	2456.069	0.000
LcomprN	141.749	1	141.749	66.390	0.000
L.involv.2	27.532	1	27.532	12.895	0.000
Lcongr.2	23.408	1	23.408	10.963	0.001
LcomprN*L.involv.2	0.491	1	0.491	0.230	0.632
LcomprN*L.congr.2	0.310	1	0.310	0.145	0.704
L.involv.2*L.congr.2	7.210	1	7.210	3.377	0.067
LcomprN*L.involv.2*L.congr.2	8.185	1	8.185	3.833	0.051
Error	495.345	232	2.135	—	—
Total	6082.000	240	—	—	—
Corrected total	723.850	239	—	—	—

$R^2=0.316$ (adjusted $R^2=0.295$)

Note: LcomprN=level of comprehension; L.involv.2=level of involvement; Lcongr.1=level of congruence of Mondolibri and Amazon websites; LcomprN*L.involv.2=interaction effect between the level of comprehension and the level of involvement; LcomprN*L.congr.2=interaction effect between the level of comprehension and the level of congruence; L.involv.2*L.congr.2=interaction effect between the level of involvement and the level of congruence; LcomprN*L.involv.2*L.congr.2=interaction effect between the level of comprehension, the level of involvement and the level of congruence.

Comprehension: $F=11.104$, P -value = 0.001) show that a difference exists between the mean value of direct credibility and the three hypotheses that were also tested for the Mondolibri website.

A test for between-subject effects was carried out: Table 15 shows that, also for the Mondolibri website, test F of interaction between the independent variables – the level of *congruence*, *comprehension* and *involvement* – was not significant (P -value = 0.40), and thus the considered variables do not show any significant interaction.

DISCUSSION

The results obtained showed that all the hypotheses were supported, for both Study 1 and Study 2. Hypothesis 1 affirms that the level of *congruence* with the scheme at users' disposal (*prototype*) is an antecedent of website credibility, thus corroborating similar results obtained in the field of human–computer interaction.^{3,6} These studies have demonstrated that individuals are

inclined to consider commercial websites more credible – and, specifically, more trustworthy and competent – when they perceive them to be more congruent with credible prototypes of commercial websites. They therefore evaluate credibility simply by comparing new stimuli with credible information, thus assigning a higher credibility to stimuli that they perceive to be more congruent. This fact is connected with the principle of similarity.⁴⁴ According to this, individuals are often motivated or persuaded more by information stimuli that they consider similar to that which they know, as regards personality, preferences or other characteristics, than by those that they do not. Whereas similarity among individuals is expressed through opinions, attitudes, personality traits, lifestyle, background and group affiliation, similarity in the area of human–computer interaction is represented, for example, by website language, graphic design, artistic style and images.

As regards Hypothesis 2, this demonstrates that the level of involvement positively influences users' perception of credibility. Online credibility depends on numerous elements that can vary from person to person: the context in which users work, their elaboration of information or the personal objectives that they aim for when they interact with websites.² In fact, during website navigation, users, on the one hand, may have different objectives according to their temporary circumstances, and, on the other, the achievement of objectives is strictly related to motivation and involvement concerning the chosen subject.^{7,16,21,45} Credibility can be more relevant when users visit websites to acquire information for their work, or in order to obtain a specific service, for instance booking a flight.

Hypothesis 3 shows that level of *comprehension* increases users' perception of credibility. This finding is coherent with results evidenced by Flanagin and Metzger⁴⁶ and by the *Anneberg School Center for the Digital Future*.⁴⁷ According to these studies, not only are users with a high level of expertise and knowledge of the Internet more inclined than novices to verify information on the Internet and to consider it more credible, but they are also more able to distinguish between bogus and reliable websites. Whereas expert users have mental schemata stored in their memory and can thus promptly elaborate new stimuli, novice users cannot. The way by which users elaborate the system of visual and verbal symbols of websites is related not only to the means of representation adopted on the website, but also to the users' perceptive characteristics and elaboration of the same. Novices and experts display different behavior patterns in their interaction with websites. First, for novices, even reading hypertextual media, such as the web, entails a cognitive effort, which would need structure of comprehension and, essentially, the use of pre-existing specific knowledge.⁴⁸ Novices have difficulty in the accomplishment of a web search, as they tend to find searching less cost-effective, implement less flexible search strategies, are more reluctant to test new approaches, and are not able to recognize relevant questions, expedients and optimal strategies for problem

solving.⁴⁹ In contrast, expert users have a more positive attitude towards websites,⁵⁰ and, when making their online purchase, take into consideration different and more appropriate elements than do novices.⁵¹

Concern for subjective characteristics – congruence of mental schemata, level of involvement and level of comprehension – in the sphere of users' perceptions of credibility is also consistent with the evaluation of credibility as proposed by Fogg^{2,17} in so-called *prominence-interpretation theory*. This asserts that credibility depends both on the likelihood that an element related to the source or to a message can be noticed by users during evaluation (*prominence*), and on the value or significance – positive or negative – that each user assigns to this element (*interpretation*). Prominence is influenced, in turn, by factors related to users' involvement, the type of information, the level of competence, the task and other individual differences, whereas interpretation is influenced by elements concerning users' knowledge and skills, and contextual factors by which the evaluation is accomplished.

These results shed light on the implementation of the proposed new model, and make it possible to obtain considerable advantages both for academics and for companies/organizations. From a theoretical perspective, this study proposes to replace the concept of objective credibility (*source credibility*, as related to the website), as employed in the literature thus far,⁵² with that of subjective credibility (*perceived credibility*, related to website users). Dimensions of website credibility – *attractiveness*, *trustworthiness* and *expertise* – should be measured not in an absolute sense, but by integrating elements of subjective credibility – users' characteristics, context of interaction and website stimuli.

From an operative perspective, this study underlies the centrality of end-users in website design and planning, as their way of processing figurative, verbal symbols and information can differ from that intended by web designer. In order for websites to meet end-users' expectations and desires, they should be designed taking into account intended customers' characteristics, the

tasks and activities they accomplish, and the organizational and social contexts in which they make use of the website. This fact is particularly pertinent to e-commerce websites, which need to attract new customers, and to online consumers who need to obtain useful information on products and services.¹⁶

Generally, individuals tend to be suspicious of and to attribute low credibility judgements both to the Internet and to online purchasing. Navigation in e-commerce websites does not allow users to obtain sensorial data usually accessible in sale points, nor to have direct contact with sales personnel for advice or suggestions. Furthermore, users have difficulty in assessing the characteristics of products and services that can be considered experience qualities, that is, qualities that consumers can evaluate only during or after the purchase.^{16,53} The collection of information entails a relevant search cost, and depends on consumers' competences and motivation, thus emphasizing the differences between novices and experts, and between less and more involved users.^{45,54} Web designers should consider these differences in order to make sites more in tune with their users: if the latter identify themselves with a website, they will be more inclined to visit it more frequently, to add it to the list of their preferred websites and to purchase from it.

CONCLUSION

For e-commerce to reach its potential, a major obstacle has to first be overcome, that of its lack of credibility with some users. Specific features of the Internet – its general and decentered character, the absence of control mechanisms and authority, and its self-referencing nature⁵⁴ – do not allow users to clearly evaluate its credibility. Additionally, online shoppers have to cope with the electronic buying process. Not only do they have to access accurate information on products and companies, but they also have to know where to find such information and how to interpret it.³⁶ Companies operating in e-commerce can take advantage of the new possibilities only if they consider the multifaceted nature of website credibility, which is more

complex than human buyer–human seller relations. The proposed model contributes to the understanding of website credibility by revealing that it depends on (i) the level of *congruence* with users' mental scheme (*prototype*), as stereotype-based expectations can influence individual's interest in and analysis of information based on their previous experiences; (ii) the level of users' involvement, as it is influenced by individuals' objectives and motivations; and (iii) the level of *comprehension*, as inexperienced and experienced users' have different perceptions of website credibility.

ACKNOWLEDGEMENTS

The authors thank Piero Convertini for his support in data collection and codification.

REFERENCES

- 1 Chiesa, E. (2002) Il concetto di usabilità, <http://www.emanuelechiesa.it/usability.html>, accessed 31 July 2008.
- 2 Fogg, B.J. (2002) *Persuasive Technology: Using Computers to Change What We Think and Do*. San Francisco, CA: Morgan Kaufmann.
- 3 Lazar, J. (2006) *Web Usability: A User-centered Design Approach*. Boston, MA: Addison Westley.
- 4 Guido, G., Prete, M.I. and D'Ettore, R. (2007) When is a duck not a duck? When it's a euro. In: L.L. Brennan and V. Johnson (eds.) *Computer-mediated Relationships and Trust: Managerial and Organizational Effects*. Hershey, PA: IGP Press, pp. 194–216.
- 5 Corritore, C.L., Kracher, B. and Wiedenbeck, S. (2003) On-line trust: Concepts, evolving themes, a model. *International Journal of Human-Computer Studies* 58: 737–758.
- 6 Fogg, B.J. and Tseng, S. (1999) Credibility and computing technology. *Communications of the ACM* 42(5): 39–44.
- 7 Wathen, C.N. and Burkell, J. (2002) Believe it or not: Factors influencing credibility on the web. *Journal of the American Society for Information Science and Technology* 53(2): 134–144.
- 8 Hovland, C.I. and Weiss, W. (1951) The influence of source credibility on communication effectiveness. *The Public Opinion Quarterly* 15(4): 635–650.
- 9 McGuire, W.J. (1985) Attitudes and attitudes change. In: G. Lindzey and E. Aronson (eds.) *The Handbook of Social Psychology* 2. New York: Random House.
- 10 Self, C.S. (1996) Credibility. In: M. Salwen and D. Stacks (eds.) *An Integrated Approach to Communication Theory and Research*. Mahway, NJ: Erlbaum, pp. 334–376.
- 11 Ohanian, R. (1990) Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness. *Journal of Advertising* 19(3): 39–52.
- 12 Bart, Y., Shankar, V., Sultan, F. and Urban, G.L. (2005) Are the drivers and role of online trust the same for all web sites and consumers? A large-scale exploratory empirical study. *Journal of Marketing* 69: 133–152.

- 13 Shankar, V., Urban, G.L. and Sultan, F. (2002) Online trust: A stakeholder perspective, concepts, implications, and future directions. *Journal of Strategic Information Systems* 11: 325–344.
- 14 Urban, G.L., Amyx, C. and Lorenzon, A. (2009) Online trust: State of the art, new frontiers, and research. *Journal of Interactive Marketing* 23(2): 179–190.
- 15 Castaldo, S. (2002) *Fiducia e Relazioni di Mercato*. Bologna, Italy: Il Mulino.
- 16 Rieh, S.Y. and Danielson, D.R. (2007) Credibility: A multidisciplinary framework. *Annual Review of Information Science and Technology* 41: 307–364.
- 17 Fogg, B.J. (2003) Prominence-interpretation theory: Explaining how people assess credibility online. CHI 2003 Extended Abstracts on Human Factors in Computing Systems, ACM Press, New York, pp. 722–723.
- 18 Kim, J. and Moon, J.Y. (1998) Designing towards emotional usability in customer interfaces-trustworthiness of cyber-banking system interfaces. *Interacting with Computers* 10: 1–29.
- 19 Nielsen, J. (2000) *Web Usability*. Milan, Italy: Apogeo.
- 20 Fogg, B.J., Kameda, T., Boyd, J., Sethi, R., Sockol, M. and Trowbridge, T. (2002) *Stanford-Makovsky Web Credibility Study 2002: Investigating What Makes Web Sites Credible Today*. Research Report Stanford Persuasive Technology Lab & Makovsky & Company. Stanford, CA: Stanford University.
- 21 Hong, T. (2006) The influence of structural and message features on web site credibility. *Journal of the American Society for Information Science and Technology* 57(1): 114–127.
- 22 Metzger, M.J., Flanagin, A.J., Eyal, K., Lemus, D.R. and McCann, R.M. (2003) Credibility for the 21st century: Integrating perspectives on source, message, and media credibility in the contemporary media environment. *Communication Yearbook* 27(1): 293–335.
- 23 Tombros, A., Ruthven, I. and Jose, J.M. (2005) How users assess web pages for information seeking. *Journal of the American Society for Information Science and Technology* 56(4): 327–344.
- 24 Fogg, B.J. et al (2001) Web credibility research: A method for online experiments and early study results. Proceedings of ACM CHI 2001 Conference on Human Factors in Computing Systems. New York: Stanford Persuasive Technology Lab, Stanford University, pp. 61–68.
- 25 Jacko, J.A., Sears, A. and Borella, M.S. (2000) The effect of network delay and media on user perceptions of web resources. *Behaviour and Information Technology* 19(6): 427–439.
- 26 Ramsay, J., Barbesi, A. and Preece, J. (1998) A psychological investigation of long retrieval times on the World Wide Web. *Interacting with Computers* 10: 77–86.
- 27 Bouch, A., Kuchinsky, A. and Bhatti, N. (2000) Quality is in the eye of the beholder: Meeting users' requirements for internet quality of service. CHI 2000 Proceedings, New York: Stanford Persuasive Technology Lab, Stanford University, pp.297–304.
- 28 Butler, J.K. (1991) Toward understanding and measuring conditions of trust: Evolution of a conditions of trust inventory. *Journal of Management* 17(3): 643–663.
- 29 Ratnasingham, P. (1998) The importance of trust in electronic commerce. *Internet Research* 8(4): 313–321.
- 30 O'Donovan, J. and Smyth, B. (2005) Trust no one: Evaluating trust-based filtering for recommenders. Proceedings of the 19th International Joint Conference on Artificial Intelligence. Edinburgh, Scotland, <http://dli.iit.ac.in/ijcai/IJCAI-05/PDF/post-0411.pdf>.
- 31 Chen, S.C. and Dhillon, G.S. (2003) Interpreting dimensions of consumer trust in e-commerce. *Information Technology and Management* 4(2–3): 303–318.
- 32 Robins, D. and Holmes, J. (2008) Aesthetics and credibility in web site design. *Information Processing and Management* 44: 386–399.
- 33 Warnick, B. (2004) Online ethos: Source credibility in an 'authorless' environment. *American Behavioral Scientist* 48(2): 256–265.
- 34 Guido, G. and Rizzo, C. (2006) Un modello di credibilità dei siti web nel commercio elettronico. *Psicologia & Lavoro* 140: 7–20.
- 35 Fogg, B.J., Soohoo, C., Danielson, D.R., Marable, L., Stanford, J. and e Tauber, E.R. (2003) *How Do Users Evaluate the Credibility of Web Sites? A Study with Over 2500 Participants*. New York: ACM Press.
- 36 Ceaparu, I., Demner, D., Hung, E. and Zhao, H. (2002) In web we trust: Establishing strategic trust among online customers. In: R. Rust and P.K. Kannan (eds.) *E-service: New Directions in Theory and Practise*. Armonk, NY: M.E. Sharpe Publishers.
- 37 Fernandes, T. (1995) *Global Interface Design*. Boston, MA: AP Professional.
- 38 Zaichkowsky, J.L. (1994) The personal involvement inventory: Reduction, revision and application to advertising. *Journal of Advertising* 23(4): 59–70.
- 39 Guido, G. (2001) *The Salience of Marketing Stimuli*. Boston, MA: Kluwer Academic Publishers.
- 40 Barsalou, L.W. (1989) Intra-concept similarity and its implications for inter-concept similarity. In: S. Vosniadow and A. Ortony (eds.) *Similarity and Analogy*. Cambridge, UK: Cambridge University Press.
- 41 Alba, J.W. and Hutchinson, J.W. (1987) Dimensions of consumer expertise. *Journal of Consumer Research* 13: 411–454.
- 42 Peterson, R.A. (2001) On the use of college students in social science research: Insights from a second order Meta-analysis. *Journal of Consumer Research* 28(3): 450–461.
- 43 Demunter, C. (2006) How skilled are Europeans in using computers and the internet, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-NP-06-017/EN/KS-NP-06-017-EN.PDF, accessed 4 November 2009.
- 44 Tajfel, H. (1982) Social psychology of inter-group relations. *Annual Review of Psychology* 33: 1–39.
- 45 Ward, M.R. and Lee, M.J. (2000) Internet shopping, consumer search and product branding. *Journal of Product & Brand Management* 9(1): 6–20.
- 46 Flanagin, A.J. and Metzger, M.J. (2000) Perceptions of internet information credibility. *Journalism Quarterly* 63: 451–462.
- 47 Annenberg School Center for the Digital Future. (2008) Digital future report 2008, <http://www.digitalcenter.org/pdf/2008-Digital-Future-Report-Final-Release.pdf>, accessed 15 February 2009.
- 48 Haas, C. and Wearden, S.T. (2003) E-credibility: Building common ground in web environments. *L1-Educational Studies in Language and Literature* 3: 169–184.
- 49 Hölscher, C. and Strube, G. (2000) Web search behaviour of internet experts and newbies. *Computer Networks* 33: 337–346.
- 50 Tabatabai, D. and Shore, B.M. (2005) How experts and novices search the web. *Library & Information Science Research* 27: 222–248.

- 51 Liang, T.P. and Huang, J.S. (1998) An empirical study on consumer acceptance of products in electronic markets: A transaction cost model. *Decision Support Systems* 24: 29–43.
- 52 Eisend, M. (2006) Source credibility dimensions in marketing communication – A generalized solution. *Journal of Empirical Generalisations in Marketing Science* 10: 1–33.
- 53 Graefe, G. (2003) Incredible information on the internet: Biased information provision and lack of credibility as a cause of insufficient information quality. Proceedings of the 8th International Conference on Information Quality, pp. 133–146, [http://www.c-lab.de/fileadmin/redactors/data/Publication_DB/DB/Graefe_Gernot_00/ICIQ%20Graefe%20C-LAB%20Website%20\(2\).pdf](http://www.c-lab.de/fileadmin/redactors/data/Publication_DB/DB/Graefe_Gernot_00/ICIQ%20Graefe%20C-LAB%20Website%20(2).pdf).
- 54 Burbules, N.C. (2001) Paradoxes of the web: The ethical dimensions of credibility. *Library Trends* 49: 441–453.