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# A MODEL OF ONLINE CREDIBILITY FOR COMMERCIAL WEBSITES


## ABSTRACT

The aim of this study is to propose a new model of *credibility* for *websites* – graphical interfaces, acting as bi-directional communication channel that enable both users and computers to communicate. In the proposed model, *website credibility* is based on: 1) *Context* of fruition – situational factors and internal characteristics of users measured by the level of *involvement* (Zaichkowsky 1994); 2) *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; 3) *Mental schemata* – unconscious cognitive representations, based on knowledge structures. These enable one to differentiate users who are *experts* – individuals who possess these schemata – and *novices* – individuals who do not (Guido 2001). Results obtained from two experimental studies showed that credibility should not be considered as an objective characteristic ascribed to its source, but as a subjective one, deriving from users' cognitive and motivational processes.



**Keywords**: Online marketing, Credibility, Online credibility, E-commerce websites, Web users.


## 1. INTRODUCTION

Internet and, specifically, *websites* – that is graphical interfaces, acting as bi-directional communication channel that enable both users and computers to communicate (Chiesa 2000) – possess distinctive characteristics, such as anonymity, interactivity, and ease of content publication (Fogg 2002), all of which have a strong influence on their use. On the positive side, websites and pages are characterized by the advantages of mass communication channels, 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 open to anyone who happens them for whatever reason (Lazar 2006). They also represent a popular means of diffusing knowledge, making it possible to obtain information on any subject, company, or organization, enabling businesses to develop trust-based relationships

with their clients (cf. Guido, Prete and D'Ettorre 2007). 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 exposed 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 as that both the Securities and Exchange Commission (SEC) – the US governmental authority that regulates security markets and defends investors – and 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 contents (Fogg 2002). 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 to obtain information about them by persuading them to participate in opinion polls and surveys (Corritore, Kracker and Wiedenbeck 2003; Fogg 2002; Fogg and Tseng 1999; Lazar 2006; Wathen and Burkell 2002).

The aim of the present study is to introduce a new model of websites 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 as well as their contexts of interaction.

## 2. 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, has been recently deepened by Hovland and colleagues in their seminal work (Hovland and Weiss 1951) and the subsequent studies in the field of communication (McGuire 1985; Self 1996). *Source credibility* is traditionally defined as a multidimensional construct, an intrinsic characteristic ascribed to the message sender, which is supposed to have a profound competence in 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 (Ohanian 1990; McGuire 1985; Self 1996). As regards websites and, specifically, e-commerce websites, numerous studies demonstrate that trust influences online purchase behavior (Corridore, Kracker and Wiedenbeck 2003; Shankar, Urban and Sultan 2002). Notwithstanding the fact that trust and credibility are interchangeable constructs, they are, in fact, different (Fogg and Tseng 1999): 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 expectancies (Castaldo 2002). As regards man-computer relations, trust refers to dependability, whereas credibility refers to believability (Fogg and Tseng 1999). Website credibility is determined by several factors (Rieh and Danielson 2006), such as impartiality, accuracy, completeness, privacy, professionalism, clarity, reliability, which are related to the dimensions of *attractiveness*, *expertise* and *trustworthiness* (Fogg 2003; Fogg and Tseng 1999; Kim and Moon 1998; Nielsen 2000).

***Expertise.*** A website can be considered expert when it facilitate straightforward interaction on the part of both skilled users and novices, when it shows usefulness and user-friendliness. Expertise is determined by: i) 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; iv) the indication, for each article, of opinions, ratings and reviews from users (Fogg 2002; Fogg *et al.* 2002; Hong 2006; Metzger *et al.* 2003; Tombros, Ruthven and Jose 2005). 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, broken links – and their impact on final results (Fogg 2002; Fogg *et al.* 2001, 2002; Tombros, Ruthven and Jose 2005). Expertise is also influenced by ease of comprehension – i.e. the capacity to reduce the process of information retrieval in memory to a minimum, by activating automatic processes of action and recognition (Nielsen 2000) – and the ease of a task – i.e. the capacity to facilitate website interaction. The latter is furthered by both clear organization of information provided in websites and the provision of navigation tools such as map sites (Fogg *et al.* 2001, 2002; Hong 2006). Furthermore, website expertise is connected with the speed of response, which can affect users' perceptions of the content quality (Jacko, Sears and Borrella 2000), of its relevance (Ramsay, Barbesi and Preece 1998) and of the security of transactions', as in the case of e-commerce websites (Bouch, Kuchinsky and Bhatti 2000).

***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 (Butler 1991; Fogg 2003; Nielsen 2000; Ratnasingham 1998).

Dimensions of trustworthiness include the presence of credentials – i.e. the easy identification of the website' owners together with their addresses, e-mail addresses or telephone numbers enabling users to contact them without effort (Fogg *et al.* 2001, 2002; Fogg 2002; Tombros, Ruthven and Jose 2005), and, for companies or institutions, the use of a URL (Uniform Resource Locator) identifiable with their names. Recommendation of websites are another element. These may include advice or promotion by the media (newspapers, magazines, e-mail newsletters), from reliable others (Fogg *et al.* 2002; Metzger *et al.* 2003), or by reputation systems (O'Donovan and Smyth 2005) – a website area in which users have the opportunity to insert their feedback, perceptions and experiences – or a link with a credible website (Fogg *et al.* 2002); these are particularly useful for e-commerce websites, as they enable users to evaluate credibility of parties involved in the transactions (Chen and Dhillon 2003; Lazar 2006). Other important factors determining trustworthiness are firstly: careful use of advertising. The excessive use of automatic pop-up windows and the presence of invasive advertising that is inseparable from contents generally reduce website credibility (Fogg 2002; Fogg *et al.* 2001, 2002), whereas message ads, consistent and connected with the information contained in the website and deriving from trusted sources add to website credibility. Secondly, the presence of help systems, providing users with adequate assistance, enriching their learning and reducing the mental effort required on their part (Fogg *et al.* 2002).

***Attractiveness***. Users evaluate website credibility mainly by considering aspects linked to attractiveness and appearance (Fogg 2002; Fogg *et al.* 2002; Lazar 2006; Rieh and Danielson 2006; Robins and Holmes 2008; Warnick 2004), because, when surfing the Internet, they tend to rapidly adopt interactive behavior (Cockburn and McKenzie 2001). They move quickly from one page to another, lingering if they are pleased by visual aspect, otherwise they abandon the website and search for other sources of information or services (Fogg *et al.* 2002; Guido and Rizzo 2006). A website shows *attractiveness* when it manages to immediately capture the attention of users, stimulating emotional and instinctive responses, through the use of colors, images, attractive design and animations (Kim and Moon 1998; Nielsen 2000). 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 (Nielsen 2000), visual layout, the use of adequate colors (Fogg *et al.* 2003; Robins and Holmes 2008) and of testimonials by well-known people (Ceaparu *et al.* 2002); ii) *seduction*, which refers to the capacity to persuade users through website graphical interfaces (Kim and Moon 1998), interactive mechanisms, the provision of personalized and memorable

experiences, for example involving users by means of *entertainment* (*games*, *interactive storytelling*, *cartoons*) (Fernandes 1995).

## 3. 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 as a perceived characteristic, that is dependent on audience attributes (Self 1996) and on users' characteristics (Fogg 2002), these studies continued to define credibility as an objective characteristic ascribed to its source, measured through the dimensions of *trustworthiness*, *expertise*, and *attractiveness*. Rather, in the proposed model, credibility is considered not as an absolute characteristic, but deriving from the cognitive and motivational process which users activate when surfing the Internet and searching for information on websites.

## 4. THE MODEL

In the proposed model, *websites* credibility is based on: 1) *Context* of fruition – users' internal characteristics and situational factors – measured through the level of *involvement* (Zaichkowsky 1994); 2) *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; 3) *Mental schemata* – unconscious cognitive representations, based on knowledge structures obtained through past experiences, inferences or external communication (Guido 2001) – according to which it is possible to differentiate between users who are *experts* – individuals who have access to these schemata – and *novices* – individuals without these schemata (Guido 2001).

The proposed model is based on the following three axioms.

*Axiom One: 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 (i.e., *banner ads*, sounds, images), which can be perceived in a different manner

(*background*); 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 the user, such as mood, stress, and the amount of time that they have at their disposal. The context of fruition has a double role: 1) It encourages the perception of a stimulus figure, which consists of a series of qualitative stimuli (brightness, movement, sound and image) (Guido 2001); 2) It activates users' schemata, as it varies according to the particular context in which the stimulus takes place (Barsalou 1989).

*Axiom Two: Credibility of Website (Stimulus) Is Not an Objective Attribute*

Credibility cannot be defined as an absolute characteristic of a specific website, but as a perceived attribute (Self 1996) depending on the perception process activated by the user, on the context of stimuli fruition and on user's mental scheme. When individuals evaluate a particular stimulus they search for a cognitive network in order to identify any type of knowledge which may prove significant and useful for the elaboration of new information. By activating this relevant scheme, which depends on the perception context, individuals try to match particular elements stimulus 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; on the contrary, the perceived incongruity between a stimulus in a particular context and users' schemata allows them to determine credibility (Guido 2001).

*Axiom Three: Credibility Depends on Users' Mental Scheme*

Website credibility depends on users' role 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) (Guido 2001). 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: The Website (in General, the Stimulus), Considered As an Example, Is Arguable to Be Considered Credible If There Is Congruency with the User's Scheme (Prototype)*

Users receive stimuli – input that attracts their attention, and that are interpreted by means of their storage in memory – which allow the creation of: i) *prototypes*, which correspond to representative model of particular membership categories (i.e., 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* – similar – with users' prototype (mental scheme), and if the initial judgment attributed to the prototype is positive.

*Proposition Two: 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 comprehension efforts during the interpretation phase (Guido 2001). If users are highly involved by website's prominent stimuli, they will give more attention to figure and any verbal stimuli, so long as these are contextually congruent with their mental schemata.

*Proposition Three: 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 c*omprehension* – the capacity to minimize the processes of information restoration in memory. In effect, a scheme becomes *active* only in certain contexts (Barsalou 1989), 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. 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, while *novices* entertain inappropriate and incongruent clues. *Experts*, in presence of numerous stimuli (i.e., a websites), are better able than *novices* at

evaluating the level of congruence of models considered as examples; furthermore, they are better able to attribute high credibility to models (examples) which are more congruent with their prototype (Alba and Hutchinson 1987; Guido 2001).
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: according to it, 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 on the prototype is positive.

*Hypothesis 2. Perception of Credibility Increases When the Level of Involving Increases*
The further experimental level is related to the Third Proposition: according to this, involvement is an antecedent and a possible moderator variable of credibility. Therefore, Hypothesis 2 aims to test if the level of involvement increases 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, activation, accessibility and availability of schemata are antecedents and possible moderator variables of credibility. The third hypothesis posits that *comprehension* (i.e. availability of schemata) increases credibility perception of the user. This hypothesis maintains that credibility evaluation of expert users is higher than of novices users, because the former can better evaluate levels of congruence.

## 5. METHODOLOGY

A causal and quantitative research was conducted, using an experimental factorial design (see Table 1, *infra*) in order to determine the nature of relations between independent and dependent variables. The study was conducted on a sample of 240 students from the Faculty of Economics and Faculty of Language and Foreign Literature at the University of Salento,

Lecce (Italy) – divided into 88 males and 152 females, grouped into three age-groups: 114 (18-22 y.o.) 110 (23-27 y.o.), and 16 (more than 27 y.o.). 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 population (Peterson 2001). Furthermore, the choice of this sample can be considered appropriate also for the fact that, according to Eurostat, about 80% of young people (aged 16 to 24) use the Internet habitually. On the contrary, 54% of those aged 25 to 54 and only 20% of those aged 55 to 74 do the same (Demunter 2006).

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. |

Two different studies were carried out, by considering e-commerce websites specialized on the online selling of books, selected according to the interests of the considered sample. In Study 1, the Amazon website (www.amazon.com) – chosen as a *prototype*, that is as a representative model of commercial website category – was compared with the Barnes & Noble website (www.bn.com) – considered as 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 laboratory, in an artificial environment in which desired conditions were created: the questionnaire was administrated in a place where participants had access to a computer connected to the Internet, allowing them to interact with the websites in question. The questionnaire included: 1) level of *involvement*, by using the scale of Zaichkowsky (1994) PIIA (*Personal Involvement Inventory for Advertising*); 2) level of *comprehension*, by means of 14 items considering the knowledge of Transfer Computer Protocol/Instruction Pointer (TCP/IP), execution of a digitalisation based on Optimal Character Recognition (OCR), and use of a system of videoconferencing, as *NetMeeting*; 3) *prototipicality*, measured by asking 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 point out their names?" (If they are not Barnes & Noble or Mondolibri, end the interview*"); 4) interaction with the three considered websites, namely Amazon, Barnes & Noble, and Mondolibri; 5) evaluation of *direct credibility*, by means of a 7-point Likert scale ("*Could you appraise how much do You consider credible this web site?*") and of *indirect credibility*, by using the scale of Ohanian (1990), based on *trustworthiness*, *expertise* and *attractiveness*; and finally 6) socio-demographic data.

The following independent variables were considered: i) the level of *congruence*: as measured by a 7-point Likert scale, subjects that assigned a value from 1 to 4 were classified as having a low congruence, while those that 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 items (Zaichkowsky 1994) with a median value of 52, subjects with value from 10 to 52 were classified as involved less, and subjects with values from 52 to 70 were classified as involved more; and iii) the level of *comprehension*: as measured by means of a 2/3-point scale and with a median value of 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 for testing if the initial judgement of the prototype – *Amazon* – was positive, and for evaluating websites taken as examples – *Barnes & Noble* and *Mondolibri*.

## 6. ANALYSIS AND RESULTS

### *6.1 Study 1: Credibility of Barnes & Noble Website (Example) in Comparison to Amazon Website (Prototype)*

The initial judgment of Amazon (*prototype*) was calculated, considering the mean value of direct credibility. The coefficient of correlation between direct and indirect credibility of Amazon website was computed, in order to show whether and how strongly these variables are related. The mean value of direct credibility of the site Amazon is 5.35, thus obtaining a positive evaluation. Table 2 (*infra*) shows that correlation between direct and indirect credibility of Amazon is .605, with p-value (Sig.)<.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% ($.605^2 = .36$).

Table 2: *Correlation Between Direct and Indirect Credibility of Amazon Website*

| | *Direct Credibility* | *Indirect Credibility* |
|---|---|---|
| Pearson Correlation | 1.000 | .605 |
| Sig. (1-tailed) | - | .000 |
| N | 240 | 240 |

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 the Ohanian scale (1990) related to the three dimensions of *attractiveness*, *expertise*, and *trustworthiness*. Table 3 shows that all dimensions are correlated.

Table 3: *Correlation Between Direct Credibility and Dimensions of Indirect Credibility of Amazon Web Site*

| | *Direct Credibility* | *Attractiveness* | *Trustworthiness* | *Expertise* |
|---|---|---|---|---|
| Pearson Correlation | 1.000 | .234 | .574 | .629 |
| Sig. (1-tailed) | - | .000 | .000 | .000 |
| N | 240 | 240 | 240 | 240 |

The same analysis was carried out for Barnes & Noble website. Table 4 shows that the correlation between direct and indirect credibility of the site Barnes & Noble is .439, with p-value (Sig.)<.001. The correlation coefficient of Barnes & Noble site is less than that of Amazon, even if it is 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% ($.439^2=0.19$). The correlation between direct credibility of Barnes & Noble and dimensions of the same construct calculated indirectly was calculated. Table 5 (*infra*) shows that all the dimensions are correlated.

Table 4: *Correlation Between Direct and Indirect Credibility of Barnes & Noble Web Site*

| | *Direct Credibility* | *Indirect Credibility* |
|---|---|---|
| Pearson Correlation | 1.000 | .439 |
| Sig. (1-tailed) | - | .000 |
| N | 240 | 240 |

Table 5: *Correlation between Direct Credibility and Dimensions of Indirect Credibility of Barnes & Noble Web Site*

| | *Direct Credibility* | *Attractiveness* | *Trustworthiness* | *Expertise* |
|---|---|---|---|---|
| Pearson Correlation | 1.000 | .299 | .391 | .442 |
| Sig. (1-tailed) | - | .000 | .000 | .000 |
| N | 240 | 240 | 240 | 240 |

In order to verify *Hypothesis 1, 2* and *3*, three ANOVA were conducted in order to determine whether there is any significant difference between subjects, by taking into account the level of website congruence assigned by them, their level of involvement and their level of comprehension (see Table 6, 7 and 8, *infra*). The results obtained (*Congruence*: F=29.442, p-value<.001; *Involvement*: F=5.178, p-value=.024; *Comprehension*: F=4.008, p-value=.044) show that a difference exists between the mean 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.

Table 6: *Direct Credibility and the Level of Congruence of Barnes & Noble Web Site*

| *Level of Congruence* | *Mean (μ)* | *Standard deviation (δ)* | *ANOVA* | |
|---|---|---|---|---|
| | | | *F* | *p* |
| Low congruence | 4.473 | 1.329 | | |
| High congruence | 5.308 | .975 | 29.442 | .000 |
| Total | 4.845 | 1.253 | | |

Table 7: *Direct Credibility and Level of Involvement of Barnes & Noble Web Site*

| *Level of Involvement* | *Mean (μ)* | *Standard deviation (δ)* | *ANOVA* | |
|---|---|---|---|---|
| | | | *F* | *p* |
| Low involvement | 4.679 | 1.284 | | |
| High involvement | 5.045 | 1.189 | 5.178 | .000 |
| Total | 4.845 | 1.253 | | |

Table 8: *Direct Credibility and Level of Comprehension of Barnes & Noble Web Site*

| *Level of Comprehension* | *Mean (μ)* | *Standard deviation (δ)* | *ANOVA* | |
|---|---|---|---|---|
| | | | *F* | *p* |
| Novices | 4.683 | 1.353 | | |
| Experts | 5.008 | 1.126 | 4.088 | .000 |
| Total | 4.845 | 1.253 | | |

The test of interaction effects was carried out in order to detect whether the relation between the variables in question – its strength and/or the sign (direction) – is modified by the value of

any other ones. Table 9 shows that Test F of interaction between the independent variables – the level of *congruence*, *comprehension* and *involvement* – is not significant (p-value=.40), so, the variables do not show any interaction.

Table 9: *Tests of Between-Subjects Effects for 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 | .000 |
| Intercept | 5323.772 | 1 | 5323.772 | 3923.505 | .000 |
| L comprN | 2.471 | 1 | 2.471 | 1.821 | .178 |
| L.involv.2 | 8.723 | 1 | 8.723 | 6.428 | .012 |
| lcongr.1 | 44.794 | 1 | 44.794 | 33.012 | .000 |
| lcomprN*l.involv.2 | .571 | 1 | .571 | .421 | .571 |
| lcomprN*lcongr.1 | 3.042 | 1 | 3.042 | 2.242 | .136 |
| l.involv.2*lcongr.1 | .442 | 1 | .442 | .326 | .569 |
| lcomprN*l.involv.2*lcongr.1 | .964 | 1 | .964 | .710 | .400 |
| Error | 314.799 | 232 | 1.357 | | |
| Total | 6011.000 | 240 | | | |
| Corrected Total | 375.296 | 239 | | | |
| R Squared = .161 (Adjusted R Squared = .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.

### *6.2 Study 2: Credibility of Mondolibri Website (Example) in Comparison to Amazon Website (Prototype)*

The correlation between direct and indirect credibility of the Mondolibri website was measured: Table 10 shows that it is equal to .502, and it has a significant p-value<.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% ($.502^2=.252$).

Table 10: *Correlation Between Direct and Indirect Credibility of Mondolibri Web Site*

| | *Direct Credibility* | *Indirect Credibility* |
|---|---|---|
| Pearson Correlation | 1.000 | .502 |
| Sig. (1-tailed) | - | .000 |
| N | 240 | 240 |

Table 11 shows that direct credibility of the Mondolibri website and the three dimensions of the same construct are positively correlated, with a high level of significance.

Table 11: *Correlation Between Direct Credibility and Dimensions of Indirect Credibility of Mondolibri Web Site*

| | *Direct Credibility* | *Attractiveness* | *Trustworthiness* | *Expertise* |
|---|---|---|---|---|
| Pearson Correlation | 1.000 | .419 | .486 | .441 |
| Sig. (1-tailed) | - | .000 | .000 | .000 |
| N | 240 | 240 | 240 | 240 |

As in the previous study, the test of *Hypothesis 1, 2* and *3* was done by means of three ANOVA (see Table 12, 13 and 14). The results obtained (*Congruence*: F=61.172, p-value<.001) (*Involvement*: F=6.555, p-value=.011) (*Comprehension*: F=11.104, p-value=.001) show that a difference exists between the mean value of direct credibility and the three hypotheses were verified also for the Mondolibri web site.

Table 12: *Direct Credibility and Level of Congruence of Mondolibri Web Site*

| *Level of Congruence* | *Mean (μ)* | *Standard deviation (δ)* | *ANOVA* | |
|---|---|---|---|---|
| | | | *F* | *p* |
| Low congruence | 3.984 | 1.799 | 61.172 | .000 |
| High congruence | 5.557 | 1.231 | | |
| Total | 4.725 | 1.740 | | |

Table 13: *Direct Credibility and Level of Involvement of Mondolibri Web Site*

| *Level of Involvement* | *Mean (μ)* | *Standard deviation (δ)* | *ANOVA* | |
|---|---|---|---|---|
| | | | *F* | *p* |
| Low involvement | 4.465 | 1.785 | 6.555 | .011 |
| High involvement | 5.036 | 1.638 | | |
| Total | 4.725 | 1.740 | | |

Table 14: *Direct Credibility and Level of Comprehension of Mondolibri Website*

| *Level of Comprehension* | *Mean (μ)* | *Standard deviation (δ)* | *ANOVA* | |
|---|---|---|---|---|
| | | | *F* | *p* |
| Novices | 4.358 | 1.868 | 11.104 | .001 |
| Experts | 5.091 | 1.522 | | |
| Total | 4.725 | 1.740 | | |

A test for between-subjects effects was carried out: Table 15 (*above*) shows that, also for the Mondolibri web site, test F of interaction between the independent variables – the level of

*congruence*, *comprehension* and *involvement* – was not significant (p-value=.40), so, the considered variables do not show any significant interaction.

Table 15: *Tests of Between-Subjects Effects for 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 | .000 |
| Intercept | 5243.975 | 1 | 5243.975 | 2456.069 | .000 |
| L comprN | 141.749 | 1 | 141.749 | 66.390 | .000 |
| L.involv.2 | 27.532 | 1 | 27.532 | 12.895 | .000 |
| lcongr.2 | 23.408 | 1 | 23.408 | 10.963 | .001 |
| lcomprN*l.involv.2 | .491 | 1 | .491 | .230 | .632 |
| lcomprN*lcongr.2 | .310 | 1 | .310 | .145 | .704 |
| l.involv.2*lcongr.2 | 7.210 | 1 | 7.210 | 3.377 | .067 |
| lcomprN*l.involv.2*lcongr.2 | 8.185 | 1 | 8.185 | 3.833 | .051 |
| Error | 495.345 | 232 | 2.135 | | |
| Total | 6082.000 | 240 | | | |
| Corrected Total | 723.850 | 239 | | | |
| R Squared = .316 (Adjusted R Squared = .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.

## 7. DISCUSSION AND CONCLUSIONS

The results obtained showed that all the hypotheses were supported, both for Studies 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 (Fogg and Tseng 1999; Lazar 2006). These studies have demonstrated that individuals are inclined to consider commercial website more credible – and, specifically more trustworthy and competent – when they perceive them to be more congruent with credible prototype of commercial websites. They evaluate, therefore, 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 (Tajfel 1982). According to this, individuals are often motivated or persuaded more by information stimuli that they consider similar to that which they know, as regards to personality, preferences or other characteristics, rather 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 which 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 (Fogg 2002). As a matter of fact, during website navigation, users, on the one hand, may have different objectives according to their temporary circumstances (Fogg 2002), and, on the other, the achievement of objectives is strictly related to motivation and involvement concerning the chosen subject (Hong 2006; Rieh and Danielson 2006; Ward and Lee 2002; Wathen and Burkell 2002). Credibility can be more relevant when users visit websites for acquiring information for their job, or in order to obtain a specific service, for instance booking a flight ticket (Fogg 2002).

Hypothesis 3 shows that level of *comprehension* increases users' perception of credibility. This finding is coherent with results evidenced by Flanagin and Metzger (2000) and by the Anneberg School Center for the Digital Future (2008). According to them, not only are users with a high level of expertise and knowledge on the Internet and to consider them more credible, but are also more able to distinguish between bogus and reliable websites. While expert users have mental schemata stored in 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 in the web site, but also to the users' perceptive characteristics and elaboration of the same. Novices and experts display different behavior pattern in their interaction with websites. Firstly, for novices even reading a hyper textual media, such as the web, entails a cognitive effort, which would need structure of comprehension and, essentially, the use of a pre-existing specific knowledge (Haas and Wearden 2003). Novices have difficulty in the accomplishment of a web search, as they tend to find searching less cost-effective (Burbules 2001), implement less flexible search strategy, are more reluctant to experiment new approaches, and are not able to recognize relevant question, expedients and optimal strategies for problem solving (Hölscher and Strube 2000). On the contrary, expert users have a most positive attitude towards websites (Tabatabai and Shore 2005), and, when making their online purchase, take into consideration

different and more appropriate elements in comparison than do novices (Liang and Huang 1998).

Concern for subjective characteristics – congruence of mental schemata, level of involvement and level of comprehension – in the sphere of users' perception of credibility is also consistent with the evaluation of credibility as proposed by Fogg (2002a; 2003) 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 in which the evaluation is accomplished.

These results shed a 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 objective credibility (*source credibility*, related to the website), as employed in literature so far (cf. Eisend 2006, for a review), 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, since their way of elaborating figurative, verbal symbols and information can differ from that intended by web designers' perceptions and competences. In order that websites are adequate to meet end-users' expectations and desires, they should be designed by taking into account intended customers' characteristics, the tasks and activities they accomplish, the organizational and social context in which they make use of the website. This fact is particularly appropriate for e-commerce websites, which need to attract new customers, and for online consumers who need to obtain useful information on products and services (Rieh and Danielson 2006). Generally, individuals tend to be most suspicious and to attribute low credibility judgements both to the Internet and to online purchasing. Navigation in e-commerce websites do not allow users to obtain sensorial data usually accessible in sale points, nor to have a direct contact with selling personnel for advices or suggestions. Furthermore, users have difficulty in assessing the characteristics of products and services characteristics, which can be considered as experience qualities, that is qualities that

consumers can evaluate only during or after the purchase (Graefe 2003; Rieh and Danielson 2006). Collection of information entails relevant search cost, and depends on consumers' competences and motivation, thus emphasizing differences between novices and experts, and between less involved and more involved users (Burbules 2001; Ward and Lee 2002). Web designers should consider these differences in order to make sites more in tune with their public: if the latter identify themselves with a website, they will be more inclined to visit it more frequently, to add it in their preferred websites and to purchase from it (Fogg 2005).

Limitations of this study can derive from the use of a sample composed of university students, that usually have a high level of web competence. Research is needed to apply this model to other consumer segments and online consumption contexts, in order to generalize results and illustrate the significance of different type of services, tangible products, institutions or brands.

The results obtained in the present study demonstrate that credibility can not be considered as an absolute quality regarding the website itself, as it reveals many facets also for the presence of a series of factors external to the Net. Online credibility should be measured, in conclusion, as a users' perceived quality deriving from their experience of interaction in a specific context, whereas the website should be considered an instrumental media by which information are provided and adapted to users' characteristics, their elaboration of information process, their structure of knowledge, their objectives and motivations.

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