Embodied agents on a branding website:
Deepening website stickiness through an attitudinal persuasion route

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Les Agents incarnés sur un site de marque :

Approfondissement sur les effets sur le Pouvoir de rétention du site, via une route d'influence attitudinale

RESUME

Les sites de marque jouent un rôle important en terme de construction de relation-client. Nous étudions les effets des Agents Virtuels Incarnés sur le Pouvoir de rétention du site (Stickiness). Nous postulons et vérifions partiellement les effets de la présence et la congruence d'un agent, via une route attitudinale, sur le stickiness intentionnel.

Mots-clés: Agents virtuels incarnés, Internet, attitudes, hiérarchie d'effets, pouvoir de rétention, design.

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ABSTRACT

Branding websites play an important role in constructing customer relationship. We study the effects of Embodied Virtual Agents on a proposed construct of Website stickiness. We review literatures in marketing, psychology, postulate effects of EVA presence and congruency via an attitudinal route, verify effects on Intentional stickiness. Results are discussed.

Keywords: Embodied agents, Internet, attitudes, hierarchy of effects, stickiness, design.

1. INTRODUCTION

Internet usage has been widening and new patterns of user behaviour seen on the Internet raise important issues. For example, some pieces of research study the effects of multi-sensorial characteristics of an electronic interface, e.g., the presence of a virtual agent, on the interface user behaviour. Embodied virtual agents are now increasingly used, in various contexts, e.g. teaching, socialization, chats, and now branding websites. However, to date many of their effects have been studied as simple empirical phenomena. Theoretical reflection is still necessary. A recently growing literature on man-machine and particularly on man-EVA interaction, leads us to propose and test a possible persuasion route, and moderating effects, for the effects of virtual agents. We model such effects, relating them to traditional constructs in psychology and marketing.

2. CONCEPTUAL FRAMEWORK

2.1 Conceptual issues

Among the many issues raised by the explosion of internet, are the nature of the roles of a branding website (Wind & Mahajan 2002), the way to optimize relationship to a brand online (Kapferer 2002), the relevance of the concepts of presence or the experiential approach (Mattwick *et alli* 2001; Helmé-Guizon 2001) or of immersion online (Hoffman & Novak 1996; Diesbach & Jeandrain 2004). Internet is a multi-sensorial media, that is, properly a "multimedia" media. We still are in our infancy in understanding and modelling the effects of the various sensorial cues available online in a marketing context.

Among such cues are audition and vision. Visual and aural cues offer a very rich variety of emotional and cognitive reactions in a communication context, which may generate persuasion through different, cognitive or affective routes (e.g. Barthes 1957, 1964, Floch 1995a, 1995b for the case of symbolical routes; Burns & Beier 1973; Burke & Edell 1989; Edell & Burke 1987; Scott 1994; O'Brien 2007 for affective, and sometimes affective and symbolical routes). Those modelling intents give persuasion processes which are far from being clearly understood, with complex affect-cognition interactions (e.g. Belch *et alli* 1982; Derbaix 1995; Diehl 2001; Alfano & O'Brien 2007).

Some research study the case of communication delivered by humans to humans and show the particular importance of non-verbal language (e.g. Ekman 1997, Ekman & Wallace 1969, Ekman *et alli* 1997; Burgoon 1978, 1990, 2000). Communication with an EVA therefore mobilizes theoretical elements from aural and visual communication in marketing, and from man-man or man-EVA (*Embodied Virtual Agents*), non-verbal, communication cited here. That makes the understanding of the persuasion processes even more complex (Bengtsson *et alli* 2001). As we can interact – with clicks online, or by speaking, or even by giving instructions via our eyes movements – with virtual agents, theorizing on such issue has become key (Nass 2007; Diesbach & Midgley 2007a,b).

2.2 Definition of an embodied virtual agent online or EVA

A virtual agent is first a piece of software which performs tasks. It is also an *autonomous* creature, following Blumberg (1996). It may perform different tasks, with more or less intelligence (in the meaning commonly used in computing sciences, that is, its capacity to react in an adapted manner, and with more or less autonomy). It can move, talk, give advice, and receive instructions. Above all, it can be made visible to the user in some form. It is hence called an embodied virtual agent (EVA). Numerous definitions may be found in the literature (e.g. Cassel & Bickmore 2000, p.3; Burgoon *et alli* 2002, p. 554; Choi *et alli* 2001, p.1; Cooke *et alli* 2002, p.488; Lu 2004, p.1). We will stick to a synthetic, comprehensive definition: "*an EVA is a piece of software, the interface of which is made visible on an*

electronic interface (it may screen, or in the future via a hologram), which acts on behalf or, or to support, a user, and which is made visible and hearable (and in the future, touchable). Its "physical" design and its degree of "intelligence" are most crucial cues".

An EVA can be considered not only as a virtual piece, which actually constitute an element of design of an interface, but also as a human or human-like counterpart. Its characteristics of embodiment or incarnation, is therefore crucial – see e.g. Cassel *et alli* (2000a, 2000b, 2000c, 2001). Most of the research related to persuasion processes in a man-agent interface context (Bickmore & Picard 2003; Bickmore 2004; Burgoon *et alli* 2000; Diesbach & Jeandrain 2004, Diesbach 2006; Rolland & Wallet 2003) focus on the effects of incarnation on persuasion.

Cassel (ibid) and Donath (2001a, 2001b) highlight the crucial importance of the agent's design characteristics. Design means here the "physical appearance"[1]. An agent may be characterized by its physical design, by its verbal and non-verbal language (Burgoon *et alli* 1990, 2000; Donath 2001; Cassel *et alli* 2001; Diesbach 2006), by its voice, size, body, clothing (including clothes, accessories), i.e. everything that might generate affective and symbolical reactions (Hirschman 1980; Holman 1980; Scott 1994), and last, by its functionalities. Therefore, embodied agents are both electronic interface design elements (e.g. in a website), but they also are animated objects that we treat like a human or social being. Hence the relevance of literatures dealing with humans reactions to elements of design (e.g. those in psychology and in advertising) or with human reactions to humans or human images. Such literatures also propose a construct of "attitude", useful for modelling the observed effects.

2.3 Conceptualization of the Website Stickiness

When exposed to an electronic interface and/or an embodied agent, an individual reacts as if it were interacting with another social being (e.g. Bartneck 2000, 2001; Nass *et alli* 1995, Nass 1996, Nass & Moon 2000; Diesbach & Midgley 2007). This is even more true if the interface seems "natural", or credible (Blumberg 1996; Nass & Reeves 1996). In a number of works, what are called "approach behaviours" in a traditional contexts studied in Environmental psychology (Mehrabian & Russel 1974; Donovan & Rossiter 1982, Donovan *et alli* 1994; Eroglu & Machleit 1993, 2003), are also observed for individuals that are exposed to an EVA (Cassel *et alli* 2000b, 2000c; Koda & Maes 1996; Cooke *et alli* 2002; Economou *et alli* 2003). That is, subjects seem to wish to interact more and interact in a deeper way when exposed to a virtual agent on electronic interfaces.

Our attempt in this research is first to try to propose a concept of Stickiness that makes sense here, and second, to test a route of persuasion that might account for the observed effects on Stickiness.

Human beings in general look for social contacts in a variety of situations of interaction, whether related to a shopping process or not. A number of researches have studied such issues, for example in shopping (Bloch & Richins 1983, Bloch *et alli* 1986; Forman & Sriram 1991; Underhill 1999), information search (Babin *et alli* 1994, 1995, 1999; Boulaire & Balloffet 1999; Nielsen 1997), in games and leisure (Bourgeon & Filser 1995; Hirschman 1994; Holbrook & Hirschman 1982). Holbrook (1986, 1994, 1999) conceptualizes a typology of "consumption benefits", which is applicable in an internet context (Helmé-Guizon 2001; Mathwick *et alli* 2001), and that integrates that need. Such findings might explain why the "naturalness" of a virtual environment seems so important for

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[1] We therefore do not understand "design" as is understood by computing engineers, for whom "design" means the functionalities of the software, or the set of actions it may perform.

the user in a man-robot or man-machine interaction (Blumberg 1996; Klein, Moon & Picard 2002; Moon & Nass 1996; Picard 1998, Picard & Klein 2001): it helps the user do as if she were acting in the real world. The role of affect in interacting with the interface, and its perceived benefits, become therefore crucial (Csikszentmihalyi 1989, 1990, 2000; Mathwick *et alli* 2001). There could be some innate "need for interaction", which EVAs might fulfil. EVAs are therefore also a component of the interface human and social dimension. In such approach, they can be possible drivers of positive or negative behaviours and intentions of behaviours, as they do in other service encounters, offline (Baker & Cameron 1996; Baker *et alli* 1992, 1994) as well as online (Diesbach *et alli* 2006; Zeithaml 2003).

Our proposal here is to go beyond measuring only behavioural measurements such as interaction-duration, or the will to return for instance, but to propose a more global concept. Such concept must account for the observed subjects' behaviours, and be related to an existing stream of research in psychology and marketing.

The approach behaviours mentioned here-above actually refer to a tendency of the interface user to stay longer, to visit more pages, have the intention to come back, and affiliate other users. All those behaviours or intentions of behaving, do perfectly match the concept of being "stick" to the interface. We suggest to regroup that collection of approach behaviours, in the Internet context, under the generic name of *Internet stickiness* and to consider that they exactly express Approach behaviours in an online context. Stickiness would therefore consist of a Behavioral dimension expressing the actual behaviours of staying more time and deepening the interaction, and of an Intentional dimension expressing the will to affiliate and the will to return.

3. PROPOSAL FOR MODELLING THE EFFECTS OF VIRTUAL AGENTS
3.1 Questioning the dominant approach: the roles of Attitudes and Congruency
Most of the existing research studying the effects of an EVA have nevertheless not integrated a strong enough theoretical reflection on *why* such effects do occur. They lack a real modelling effort. In a number of cases for example, scholars quote some other scholars who refer to the need for "naturalness", that is, the need for a natural-like, credible EVA, and give it the status of a framework. It is agreed on that an agent should be credible, and natural-like. But still, this does not help modelling. As such, a substantial part of the research on the subject could be considered as somehow a-theoretical. Hence, it may be useful to examine the concept of attitude toward an agent or a site and of hierarchy of attitudinal effects. An EVA may also have effects, not only through its presence but also through its design: hence the concept of agent-website congruency (Heckler & Childers 1992; Lynch & Schuler 1994; Diesbach 2006).

3.2 The concepts of attitude, proposal of an attitudinal hierarchy of effects
A first approach could be to consider the concept of Attitude, and integrating it into a sequence of step-by-step or "hierarchy", of effects. Attitude may be defined as a durable disposition in answering in a constant way to some situation, stimuli, aspects, characteristics, of an object, a person, an environment, etc. The referred "object" may also be a brand, a product or service, an outlet (Bagozzi 1999; Batra 1986; Belch & Belch 1998; Chaiken 1980; Derbaix 1995, Derbaix & Pham 1898, 1991; MacKenzie *et alli* 1986). Attitudes have been integrated into a succession of effects generated by the stimulating object, called a "hierarchy of effects" (e.g. Chaiken 1980; Fishbein & Ajzen 1975; McGuire 1977; MacKenzie, Lutz & Belch 1986; Ray *et alli* 1973). The concepts of attitude and of hierarchy of attitudinal effects (HAE) have been extended to the internet context (Stevenson *et alli* 1999; Bruner & Kumar

2000; Chen & Wells 1999; Karson & Fischer 2005). Muller (2004) and Diesbach (2006) propose to integrate the succession of effects from the website on the attitude toward the site, and then on the attitude toward the brand. Diesbach adds to the model of Müller, the concept of "attitude toward the embodied virtual agent", considering that an EVA may be considered as a virtual salesperson of service personnel, and that an attitude towards it may be assessed, as it is with a real human being. Effectively, the concept of Attitude towards the salesperson (Babin *et alli* 1995, 1999) makes sense, whether the "agent" is real or virtual.

We therefore propose a hierarchy of effects (HAE) which integrates constructs of attitudes related to man-man interaction in a marketing context (Attitude towards a salesperson), and of attitudes related to a man-agent and man-machine interaction (A_{eva} and A_{ws}). Last, we posit a specific order: it is assumed that the formation of an attitude towards the EVA (A_{eva}) may precede the formation of the attitude towards the website (A_{ws}) and finally the attitude toward the brand (A_b). Other orders as well as feedback effects among such attitudes, might be posited and will be studied in future research, but we made the present choice, as a first step in investigating the possible HAE in man-machine and man-agent interaction.

Overall it is posited that the presence of an EVA will have positive effects on each attitude, that effects will follow a hierarchy of attitude from attitude towards the agent, to attitude towards the website, and finally to attitude towards the brand. Last, positive effects of each attitude on Website stickiness are expected.

3.3 The concept of agent-website congruency

Research in environmental psychology has first focused on the role of design elements such as music, noise, odor, colors, etc., on affective reactions in a first step, and on intentional and actual behavioral reactions called approach-avoidance reactions, in a second step. Such framework has been applied with questionable results, in a marketing context-particularly music or colors in an advertising context. Then it was posited that such ambiance or design elements had effects not only through the affective reactions, but also through the *congruency* of such cues. Congruency refers to how much an element of design fits, or corresponds to the global object/support to which it is attached (e.g. Heckler & Schilders 1992; Lynch & Schuler 1994). Research in advertising and consumer behavior uses the concept of congruency between an element of design and a more global object or support. In advertising for example, the congruency between an ambience music and the commercial environment, is studied (Rieunier 2000; Diesbach 2002), or with the advertising message in which it is used, offline or online (Gallopel 1998; Galan 2003). Scott (1994) studies the symbolic dimension of advertising images and on the role of its congruency with the ads or environment in which it is used. Last, Kroeber-Riel (1979, 1984) shows the congruency of a human image with the advertised products and brand values, have effects on consumers' attitudinal and intentional reactions. We define EVA-website congruency as "*the degree to which the EVA corresponds to its website. Agent's presence and congruence are expected to generate positive effects*".

Our hypotheses posit a positive effect of agent presence on the three attitudes, and last on navigation duration, on the number of pages visited, and on the intentions to return and to recommend (that is, on Website Stickiness). They also posit a positive moderating effect of the agent-website congruency, on the effects of the presence.

Globally, positive effects are expected from the agent presence on each attitude and on Website stickiness, in the proposed hierarchy of effects, with a positive moderating effect of agent-website congruency on the effects of the attitudes (see figure + hereafter):

Figure 1: Research model, effects through the hierarchy of attitudinal effects

4. TEST OF THE MODEL AND RESULTS

4.1 Scale construction and validation process

Constructs of Attitudes and Website stickiness are operationnalized as follows. All attitudinal constructs, as well as the two components of Intentional Stickiness (see hereafter) are assessed on a 7-point scale. A traditional process of scale purification is realized through exploratory and confirmatory analysis, following Hair*et alli* (2002) and Malhotra (2000).

For testing the measurement scales, we used 4 dimensionality criteria in the exploratory analysis:

- the Elbow test, which is often (wrongly) assimilated to the Scree test, whereas those are two different tests, which only *sometimes* converge (see Cattell & Vogelmann 1977, p.293) which consists of conserving only the axis preceeding the most curved elbow in the eigen-values, ranked following their extraction order;

- the Scree test, that consists of eliminating axis corresponding to the most persistant and/or the last phase of alignment of the eigen-values;

- the Kaiser test;

- the Velicer test, consisting of conserving the number of axis that minimizes the residual correlations sum of squares.

We followed the most demanding criteria levels in the confirmatory analysis (SRMR<0.05; TLI and CFI>0.95), following recommendations by previous research (e.g. Galan 2003; Diesbach 2006) who propose a meta-analysis of existing recommendations on the subject.

The Attitude towards the agent proposes to conceive the agent as an almost-human-being, an atmospheric and an aesthetic cue of the website (Babin et alli 1999; Bergeron 2001; own proposition, from Mehrabian & Russel 1974).

After purification, the measurement scale consists of the 4 following items (the Exploratory analysis provide excellent results; sig ***<0.01, SRMR=0.012, TLI=0.984, CFI=0.995 are the index provided by the Confirmatory analysis): *I like the animated character displayed on the website; The animated character has left me a good feeling; I like people who behave like the animated character; This animated character is very entertaining* (*divertissant* in French).

For the Attitude toward the Website we follow the seminal measurement scale proposed by Bruner & Kumar (2000), Chen & Wells (1999), Wolfinbarger & Gilli (2001a,b), confirmed by Müller (2004), and enriched by items derived from Mathwick & alli (2001) and Bergeron (2001). After purification the scale consists of 5 items: *I like the website on which I have just been navigating; I believe it is a good website; I believe it is a nice website to discover; ; This website is very distracting/entertaining; The website is convincing* (the Exploratory analysis provides excellent results; Confirmatory analysis: sig ***<0.01, SRMR=0.019, TLI=0.97, CFI=0.99).

The Attitude towards the brand is taken from Till & Busler (2000) and Müller (2004), as their research context is extremely similar to ours. It consists of 5 items assessed on a 7-points Differential Semantic scale as follows: *Very poor/very good; Not at all appreciated/highly appreciated; Not at all desirable/highly desirable; Very poor quality/very high quality; I*

don't like/I like. The whole scale is validated (the Exploratory analysis provides excellent results; Confirmatory analysis: sig. ***; SRMR=0.026; TLI=0.96; CFI=0.98).

The proposed construct of Website Stickiness consists of two dimensions. An Intentional dimension composed of the Intention to return (1 item: *I will visit again that website in the future*) and of the Intention to Recommend in three different internet-related context (3 items: *I will speak positively of this website to friends; I will recommend this website to friends for their purchases; When on forums, I will speak positively of this website to peoples who might be interested*). The measurement scale is also validated in the exploratory, and then the confirmatory analysis (sig.***; SRMR=0.025; TLI=0.953, CFI=0.975).

For Behavioral Stickiness we use direct measurements: Navigation Duration is measured in number of seconds, and Number of pages visited is directly measured by the number of pages visited (both thanks to the extracted log files).

4.2 The experimental design
An experiment was conducted in the FRANCE TELECOM R & D laboratory, Man-Machine Interface Division, in 2004. An external agency randomly recruited 392 subjects, representative of the French internet-users population at the time in term of gender and age, all more than 2-years old web users, to perform a data-collection-oriented navigation on two informational branding websites (Primolea (Olive oil, commercial website) and Traser (Diving watches, only branding (no selling)), the first a branding site, the second a branding and selling site). Those two sites were chosen because their owners accepted to give us the access codes, in order to attach virtual agents for our experimentation on a local server - they are convenience websites, and ecological validity may suffer from that. The virtual agents designer, MY-DAVI.COM, designed 4 ad-hoc agents for the purpose of our experimentation. We tested two agents on each website in order to evaluate the possible moderating effect of agent/website congruency (see examples in figure 2).

Figure 2: Two (out of the four) agents used in the experiment:

Subjects were randomly affected to navigation on one or the other website, and for each, on a navigation without vs with an agent (that is a condition "Absence EVA" vs "Presence EVA"). A total of 344 valid questionnaires and 155 purified log files (only for Traser site) are used for data analysis. Hypothesis, extracted from a larger model, are numbered from H5 to H18. Numbers are unchanged, so to keep consistency with future publications on a more global, original model.

4.3 Results and discussion
A qualitative pre-test realized with students and professionals showed that the supposedly congruent/non-congruent EVAs were effectively perceived as congruent or non-congruent with the website to which they were attached. Then, a quantitative pre-test realized with 40 MBA students in a French Business School at the end of a marketing class, confirmed such assumption of an actual congruency/non-congruency (sig.<0.01**).

After having performed exploratory and confirmatory analysis, the conserved scales are as follows:
Attitude towards the agent consists of 4 items,
Attitude towards the site consists of 5 items,

Attitude towards the brand consists of 5 items[2].

A measurement of the construct of Website Stickiness, encompassing two dimensions (an attitudinal and an intentional dimension) is proposed and validated. The proposed hierarchy of effects is also validated[3], with some exceptions. The first step of the hierarchy of effects (H5: effects of congruency on A_{EVA}) is not validated. Then, all the posited concerning effects among the attitudes are validated (H6, H7, H8: βst=+0.21 to 0.62). Effects of the attitudes on the intentions to revisit and to recommend (that is, on the Intentional stickiness), are validated (H14, H16, H18: βst=+0.45 to 0.80). Nevertheless, the effects of attitudes on the Behavioural stickiness (H13, H15, H17) are not validated.

Most of the confirmed effects, when significant, are *quite homogeneous,* without being exactly equal, across the two tested sites (Chow tests). That is, the type of site itself seems to have some, though little, effect on the validation of such route of influence.

Last and surprisingly, the agent-website congruency does seem to have some kind of effect but it varies with the tested website and agents – the effects of congruency may be positive or negative - and second, they are never significant (p>0.05). This is in a way a deceiving result as it disconfirm our expectations, as well as a very interesting one, as it leaves rich research avenues in order to understand why such effects (or non-effects) occur. So, the expected effects of agent-website congruency are not confirmed.

Figure 3 gives a representation of the validated and non-validated hypothesis:

Figure 3: Results of the tests

4.4 Contributions and limits of the research
We have recorded some of the important results in the literature on man-agent interaction, and have highlighted that most researches conducted on EVAs, do not propose a comprehensive enough theoretical framework. This research proposes a model which may explain a part of the observed effects. It posits a hierarchy of attitudinal effects and the effects of such a hierarchy on behavioural and intentional criterion variables, which in turn, form a construct of Interface or (here) Website Stickiness.

The construct of stickiness is validated. Then, hypotheses are tested. The attitudinal route is partly confirmed and we note significant effects from Agent presence on Attitudes, across attitudes, and from Attitudes to Intentional Stickiness. But some effects (effects of Attitudes on Behavioural stickiness) are not significant. Our model is possibly under-specified, as simple effects measurements show that such effects do occur (Diesbach *et alli* 2007).

Second, it is clear that we have posited one possible sequence order across attitudes: 1-Attitude towards agent, then 2-Attitude towards site, then 3-Attitude towards brand. But attitudes towards the site, e.g. how much users appreciate the rich uses of multimedia cues in the site in general, might impact their acceptability and user reactions to an agent. The attitude towards the brand, for example a very positive attitude towards the HONDA website, related to a high satisfaction with the last purchased car, might also impact reactions towards the site design and content and hence towards the attitude, and also towards the attitude towards the agent alone. Different sequence-order effects as well as feedback effects may need to be studied: this paper focuses on one possible order, as posited by Bruner & Kumar

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[2] Detailed measurement scale may be communicated upon request.
[3] Significance of effects is always high: p-values <0.01** or <0.001***.

(2000), it includes one additional attitude (Attitude towards the agent) in such route, and tests it.

The effects of EVA-website congruency are not properly captured in this model. Qualitative interviews show that such congruency does matter, but quantitative measurements do not account for significant effects here. That means, other variables should be included here: does the EVA likeliness, gender, full-or-partial display, consistency with the user's design preferences, values, self-concept, expertise, etc. Impact? All those are avenues for future investigation and for more specified modelling intents.

Last, one limit is inherent to any experiment: we have controlled a number of variables such as the real navigation on the site and exposition to the agent, gender, age, but in spite of a large sample the generalizability of our findings is limited by the fact that we cannot know if other non-controlled variables have had an effect, such as (without being exhaustive): expertise online, innovativeness, attitude towards internet in general, etc. That is, many variables related to the subjects may moderate the observed effects. Additionally, many virtual agent-design related variables may be also need to be taken into account. Some have been mentioned such as agent agreeableness. More specifically its gender, size, format (only head or all the body), its level of anthropomorphism, zoomorphism, or totally imagined, cartoon-like design, its non-verbal language cues, its voice and the many variables related to audio interaction might be also relevant. These last points also open a number of research avenues related to research in psychology, and man-man and man-machine interaction.

This leads us to the main contribution for practicioners: the presence of a virtual agent seem to have positive effects according to our pre-tests, as well as to our discussion maintained after the experiment with the General Manager of Groupe LA POSTE, or with the webmaster master of VOYAGESSNCF-EXPEDIA, the latter having been using EVAs for years now. Its design was done intuitively and it seems to be successful in term of acceptability and approach behaviour enhancement – namely, making users will to solve their problem, to stay online and to buy. But nobody so far seem to know why it works, which pitfalls have been avoided, nor how it could be improved. Again, research avenues related to the afore-mentioned issues remain open.

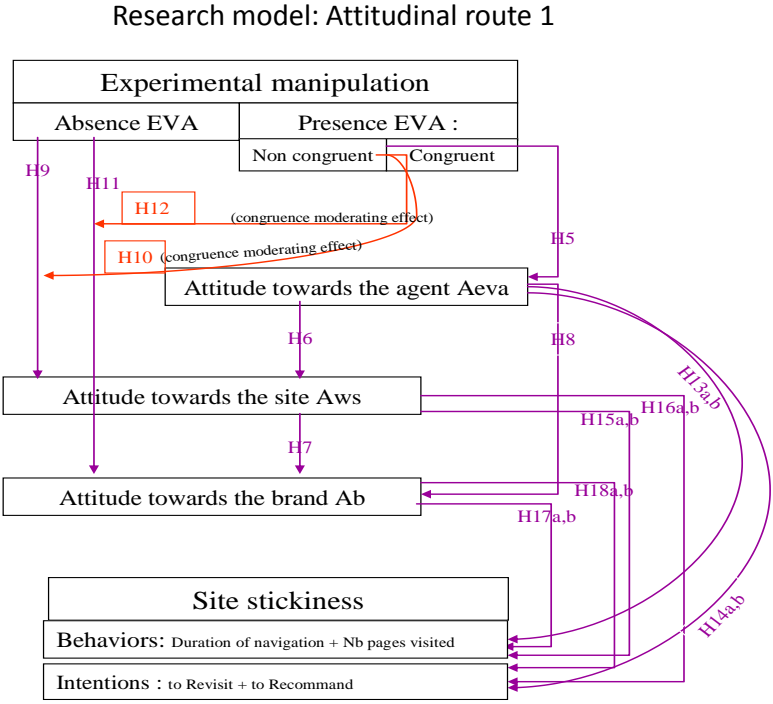**Figure 1: Research model, effects through the hierarchy of attitudinal effects**

Research model: Attitudinal route 1

Figure 2: Two (out of the four) agents used in the experiment:

Figure 3: Results of the tests

Research model: hypothesis testing, Attitudinal route

Experimental manipulation	
Absence EVA	Presence EVA:
	Non congruent / Congruent

H9**

H11***

H12NS

H10NS i-

Attitude agent A EVA

H5 Nsi

H6***
(+ 0.53 ,H)

Attitude towards site A ws

H8**
(+ 0.21 ,H)

H14a,b*** (+ 0.45 ,Nb)

H13a,b Nsi-

H7***
(+ 0.62 ,H)

Attitude towards brand A B

H16a,b (***0.80 ,H)

H15a,b NS

WESITE STICKINESS

Behaviors : Navigation duration + Nb pages visited
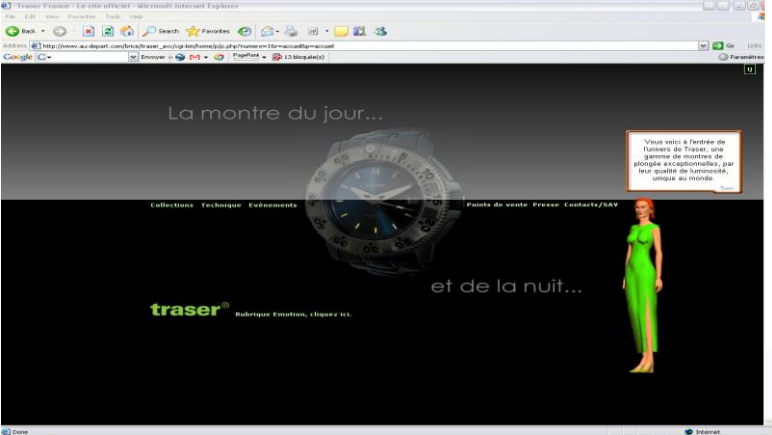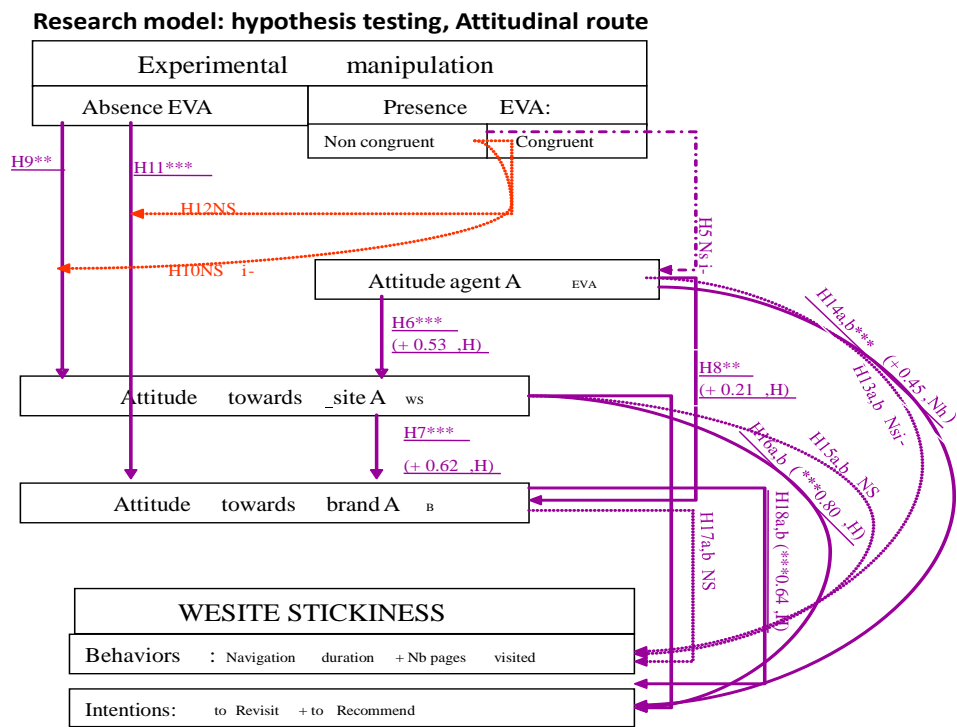
Intentions: to Revisit + to Recommend

H17a,b NS

H18a,b (***0.64 ,H)

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