

ACA as E-Atmospherics: Is There an “Animation Predisposition” Effect?

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Abstract

Academic literature recognizes animated conversational agents (ACA) as part of e-atmospheric and indicates that the use of such agents on commercial websites might be a source of social presence and experiential value. Within this framework and referring to Serenko's (2007) work on the degree of animation predisposition, the aim of this paper is to study the moderating effect of the degree of animation predisposition on the relationship between social interactivity and experiential value. We propose a six hypotheses research model that we test by using SmartPLS2. The results confirm the importance of e-atmospherics in the construction of a pleasant experience on commercial websites and indicate a moderating effect of degree of animation predisposition.

Keywords: Animated Conversational Agents (ACA), experiential value, e-atmospheric, degree of animation predisposition

1. Introduction

Marketing literature abounds on the importance of environment and atmospheric variables in the consumer shopping experience. Kotler (1974) is the first to introduce the term “atmospherics” within a marketing context. Recently, several works have studied commercial website atmospherics (Eroglu, Machleit & Davis, 2001, 2003; Daily, 2001, 2004; Gharbi, Ettis & Ben Mimoun, 2002; Ben Mimoun & Gharbi, 2006; Allagui & Lemoine, 2008). The majority of those works tend to associate site atmospherics elements to three major categories: technical features, layout design and social interactivity. The present work focuses on the third category of e-atmospheric variables by considering that animated conversational agents used on a website may favor social interactivity.

In fact, academic literature indicates that the use of animated conversational agents (ACA) on computer screens might be a source of social presence and trust among shoppers (Baier & Stüber, 2010; Keeling & McGoldrick, 2008; Wood, Solomon & Englis, 2005). Within the framework of software computing, Serenko (2007) shows that the effect of the presence of an animated conversational agent depends on the consumers' degree of animation predisposition. However, this effect has not been tested for commercial websites yet.

The purpose of this paper is to study the moderating effect of the degree of animation predisposition on the relationship between social interactivity and experiential value.

2. Theoretical Background

2.1 Website Atmospherics

Turley and Milliman (2000), then Baker, Parasuraman, Grewal and Voss (2002), listed more than sixty empirical researches establishing the existence of a strong relationship between atmospherics and consumer purchase behavior. Within the Web context, Dailey (1999) highlights the importance of the atmospherics and showed that conditions presented by Kotler (1974) for an offline purchase are transposable within the framework of an online purchase. Alba et al. (1997) specify that, as for classic stores, atmospherics elements can be an important tool of differentiation between websites. Menon and Kahn (2001) indicate that thanks to the technological development of the web, atmospherics used by classic stores become compatible with websites.

Following the research tradition in offline store atmospherics, Dailey (2004) defined web atmospherics as the “conscious designing of web environments to create positive affect and/or cognitions in surfers in order to develop positive consumer responses”. Dailey (1999) and Eroglu et al. (2000; 2001; 2003) propose two different models of

store atmospherics adapted to the web. Both models consider that web atmospherics variables impact the online consumer's behavior by affecting their emotional reactions and their cognitions.

Eroglu et al. (2000; 2001; 2003) suppose that online store atmospherics entail two categories of cues: "high task-relevant cues" and "low task-relevant cues". On one hand, high task-relevant cues relate to all descriptors of the site (verbal or pictorial) that appear on the screen and facilitate the achievement of shopping goals. On the other hand, low task-relevant cues refer to all information present on the site but that are not useful for the fulfillment of shopping tasks.

By establishing a parallel between the three dimensions of offline atmospherics proposed by Baker (1986) and some characteristics of websites, Gharbi et al. (2002) and Ben Mimoun and Gharbi (2006) suggest to measure web atmospherics through four dimensions: telepresence, vividness, technical interactivity and social interactivity.

Allagui and Msaad (2006), Allagui and Lemoine (2008) and Lemoine (2008) adopt a similar approach and present a conceptual framework including a taxonomy of web atmospheric cues. They establish a parallel between Baker (1986)'s classification of offline atmospherics and web atmospherics and present three major dimensions of web atmospherics: sensory ambient features, layout design and social interactivity.

The present research focus on the last dimension of web atmospherics as presented by Gharbi et al. (2002), Ben Mimoun and Gharbi (2006), Allagui and Msaad (2006), Allagui and Lemoine (2008) and Lemoine (2008), that is social interactivity.

The social dimension of website interactivity refers to the social support provided by the site. According to Cook (1994), social interactivity occurs when the user considers that (s)he is in interaction with another person and not with a machine.

Indeed, in absence of any direct human contact, the individual "humanizes" the virtual environment (Chang, Simpson, Arvin & Tekchandaney, 2002). Likewise, Reeves and Nass (1996) show that people tend to treat computers as human beings and to assimilate communication mediated by computer to social communication.

Tractinsky and Rao (2001) indicate that the assertions of Reeves and Nass (1996) are transferable to websites under certain conditions. They considered the interaction with a website as fundamentally social and indicate that, as for any social interaction, a website has to possess certain pleasant characteristics appropriated for human beings (politeness, flattery, capacity of evaluation of others, self-assessment and expertise) to succeed and to build a long-term relationship with the users.

Tractinsky and Rao (2001) specified that in order to possess these characteristics a website has to enable a minimum of direct and real time interactions between the company and site visitors. Every visitor has to be treated with a minimum of customization and the website must be able to help the consumer by presenting advices and useful information concerning products the consumer wishes to buy.

Consequently, social interactivity of a website is high when it allows the user to communicate in real time with the company or with other Internet users, when the site gives answers to precise questions and when browsing is linked to an interpersonal communication (Blattberg & Deighton, 1991). The use of animated conversational agents (ACA) seems to be an ideal solution to increase the social interactivity of a commercial website. This idea will be discussed in the following section dedicated to the study of animated conversational agents and their impact on e-consumer behavior.

2.2 *Animated Conversational Agents and Consumer Behavior*

Holzwarth, Janiszewski, and Neumann (2006), Wang, Baker, Wagner and Wakefield, (2007), Notebaert (2005), Lemoine and Notebaert (2011), Diesbach and Galan (2006) and Diesbach and Midgley (2007) suggest studying the animated conversational agents on a website as an element of the online store atmospherics.

Building on the work of Cassell, Sullivan, Prevost and Churchill (2000), Diesbach and Galan (2006) define an animated conversational agent as "*a graphic character designed on computer which possesses the capacity to have a dialogue during an encounter with a user, by using not only the speech but other nonverbal capacities such as gesture, glance, intonation and physical posture*".

Since the first work of Cassell et al. (2000), several studies have presented the impact of ACA within the context of e-commerce websites. Notebaert (2005) consider the use of an ACA on a commercial website as a strategy to improve trust, satisfaction and positive e-WOM. Punj and Moore (2009) specify that satisfaction depends on the capacity of the agent to facilitate the information search and to identify the product corresponding to consumer's needs. Lemoine and Notebaert (2011) present the use of ACA on commercial websites as a mean to attract new customers by improving positive e-WOM and trust.

McGoldrick et al. (2008) establish a parallel between human salespeople and ACA and identify three possible roles of online virtual sellers: social role, recommendation agent role and assistant role.

Finally Holzwarth et al. (2006) indicate that the presence of an ACA on a website improves the experiential value derived from the site visit. Ben Mimoun and Poncin (2012) found a similar result but they precise that it is the use of the ACA and not just the mere presence of the agent that improves the perceived value. We discuss in what follow the concept of experiential perceived value.

2.3 The Experiential Perceived Value

The concept of experiential value was introduced into the marketing literature by Holbrook and Hirschman (1982). Holbrook (1999) develops a typology of experiential perceived values according to three axes: (1) intrinsic or extrinsic values, (2) self-oriented or others-oriented values and (3) active or reactive values. Babin, Darden and Griffin (1994) summarize the extrinsic/intrinsic dichotomy of perceived values with two dimensions: the utilitarian dimension and the hedonic dimension.

The utilitarian value dimension is extrinsic and is related to the task or the product (Van Der Heijden, 2004). In contrast, the hedonic value dimension is more subjective and personal, and results more from fun and playfulness than from task completion (Holbrook & Hirschman, 1982; Babin et al., 1994).

In line with consumer behavior literature that distinguishes between utilitarian and hedonic value (Holbrook & Hirschman, 1982; Babin et al., 1994), Ben Mimoun and Gharbi (2006), indicate that dimensions of website experiential value depend on website atmospherics and more specifically on social interactivity.

Allagui and Lemoine (2008) show that the presence of an ACA is an efficient tool to improve social interactivity of websites but Serenko (2007) demonstrate that the effect of this type of virtual agents depends on the “degree of animation predisposition”.

2.4 ACA and the Degree of Animation Predisposition

Serenko (2007), define animation predisposition as: “an individual specific trait that reflects a person’s predisposition towards watching animated films”. He presents animation predisposition as a distinct and independent research construct exhibiting desirable psychometric properties. He empirically proves that the degree of MS Office users’ animation predisposition is positively associated with their perceptions of enjoyment with the MS Office animated agent. Serenko (2007) indicates that people with a higher degree of animation predisposition tend to better appreciate the presence of interaction with an ACA when using MS Office. But the question is: can we find a similar result in a shopping situation on a commercial website?

3. Research Framework

The present research framework is developed to study the moderating effect of degree of animation predisposition on the relationship between social interactivity and experiential value. It includes concepts related to experiential perceived value (hedonic value dimensions), e-atmospherics (social interactivity) and approach behavior (behavioral intention). As shown in figure 1, the research model is composed of six hypotheses.

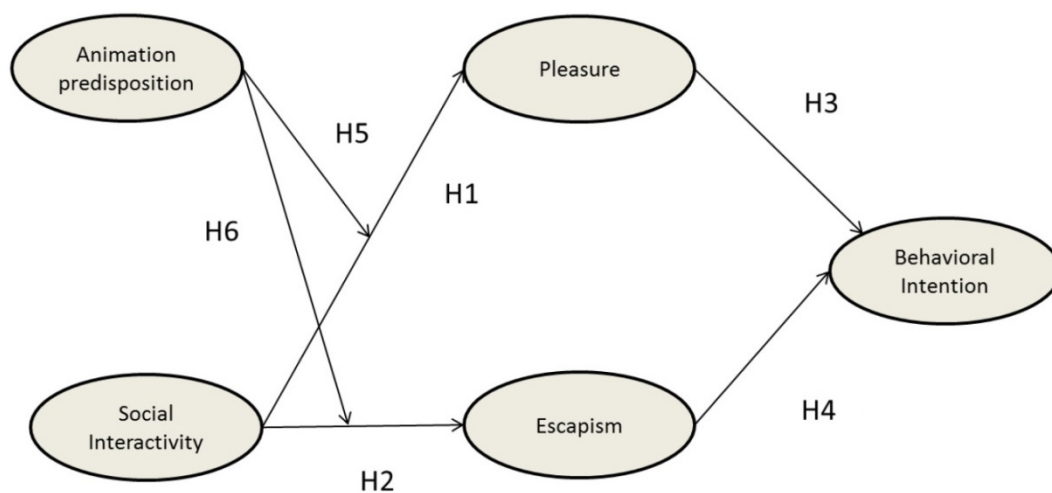


Figure 1. Research model

4. Methodology

4.1 Sample and Data Collection

A survey was conducted among e-shoppers to obtain data to test the proposed model. The samples consist of 200 respondents who used e-commerce sites at least once. Among the 200 respondents, 47% are males and 53% are females. The majority of respondents are between 20 and 30 years. Educational levels are generally high. Before responding to the questionnaire, participants were asked to visit a commercial website containing an ACA and to search for a product with the help of the ACA.

4.2 Measurement Scales

Constructs in the model are measured thanks to five-point Likert scales (1 = strongly disagree/5 = strongly agree). Measurement scales are adapted from previous studies and refined to make them specifically relevant to the present study. Structural Equations Modeling (SEM) with SmartPLS is used to test the validity and reliability of the different scales.

5. Results

The model is tested using SmartPLS2, a modeling tool of structural equations modeling (SEM) using regressions in the slightest squares or partial least squares (PLS). SmartPLS2 allows testing both psychometric properties of a measurement model (reliability and validity of each scale) and the estimation of parameters of the structural model (strength of the relationships among the different variables of the model) at the same time.

Table 1. Estimation of the reliability of measurement model

Variable	Composite reliability	AVE	Cronbach's Alpha
Social Interactivity	0.8931	0.7373	0.8212
Degree of animation predisposition	0.9377	0.7903	0.9142
Pleasure (hedonic perceived value dimension)	0.8268	0.6150	0.6892
Escapism (hedonic perceived value dimension)	0.8242	0.6099	0.6830
Behavioral Intention	0.8911	0.8038	0.7611

As shown in Table 1, results relative to the psychometric qualities of the variables in the model indicate that the used scales are strong and reliable.

Composite reliabilities for the scales are between 0.82 and 0.93, which exceed the recommended threshold (Fornell & Larcker, 1981; Burton-Jones & Hubona, 2006). Furthermore, in line with recommendations by Fornell and Larcker (1981), the average extracted variance (AVE) is superior to 0.5 for all the variables. Convergent validity is also verified with SmartPLS. Results indicate that all the items are more strongly correlated with their own latent variables. All the items have a coefficient of level-weighting relative to their own latent variables equal to or greater than 0.7. This establishes the convergent validity for all the latent variables (Yoo & Alavi, 2001; Burton-Jones & Hubona, 2006).

Results of the test of the model indicate that perceived social interactivity has a positive and significant effect on pleasure ($\beta=0.435$; $p<0.001$) and on escapism ($\beta=0.367$; $p<0.001$) supporting H1 and H2. There is also a significant positive effect of pleasure on behavioral intention ($\beta=0.281$; $p<0.05$) supporting H3. Contrary to the prediction in H4, there is no significant effect of escapism on behavioral intention ($\beta=0.102$; $p>0.05$). There is also no significant moderating effect of the degree of animation predisposition on the social interaction – pleasure relationship ($\beta=0.087$; $p>0.05$). Consequently, H5 is not supported. Contrary to the expectation in H6, we find a significant but negative moderating effect of the degree of animation predisposition on the social interaction – escapism relationship ($\beta=-0.246$; $p<0.05$).

6. Discussion and Conclusion

As presented in table 2, results of the SEM with SmartPLS support three of our six hypotheses.

Results indicate that the two dimensions of hedonic value (perceived pleasure and perceived escapism) depend on the perceived social interactivity. This is similar to the findings of previous researches (Allagui & Lemoine, 2008) indicating that the social aspect of e-atmospherics or social interactivity positively affects hedonic value. In addition, this first result confirms the importance of e-atmospherics in the construction of a pleasant experience on commercial websites (Dailey, 1999; 2004; Eroglu et al., 2000; 2001; 2003).

Table 2. Hypotheses test summary

Hypotheses	Outcome
H1 The greater the perceived social Interactivity of a web site, the greater will be the perceived pleasure of using this web site.	Supported
H2 The greater the perceived social Interactivity of a web site, the greater will be the perceived escapism.	Supported
H3 Pleasure will positively influence the intention to use or to buy from a web site	Supported
H4 Escapism will positively influence the intention to use or buy from a web site	Not supported
H5 An increase in “degree of animation predisposition” increases the effect of social Interactivity on perceived pleasure	Not supported
H6 An increase in “degree of animation predisposition” increases the effect of social Interactivity on perceived escapism	Not supported

Results also indicate a positive impact of perceived pleasure on the intention to revisit the website or to buy on a website, thus confirming the importance of building a pleasant experience for the success of websites (Eroglu et al., 2001; 2003).

Finally, results indicate a moderating effect of degree of animation predisposition on the relationship between social interaction and escapism. But the direction of this effect is opposite to our expectations. In fact, building on Serenko (2007)'s results, we expected that an increase in the degree of animation predisposition would increase the positive effect of social interactivity on perceived pleasure, but our results indicate just the opposite (i.e. an increase in degree of animation predisposition decreases the positive effect of social interactivity on perceived pleasure). This surprising result could be explained by the difference in the level of embodiment of the ACA used in our study and in the Serenko (2007)'s study. In the latter study, the ACA is more assimilated to a cartoon character while in our study we use an ACA with a higher level of “human” embodiment. In addition, the scale proposed by Serenko (2007) to measure the degree of animation predisposition focuses on the acceptance of cartoon characters, whereas the scale we use to measure social interactivity focuses on the perception of an interaction with a human-being. As indicated by Ben Mimoun, Poncin and Garnier(2012), we have to take in to account the level of agent embodiment in order to better explain the effect of using an ACA on a commercial website. Therefore, this study offers a starting point for further research regarding the relationship between the degree of animation predisposition and the level of ACA embodiment.

Findings from this study have both research and managerial implications. For example, the study lends credence to the roles of e-atmospherics in the construction of a pleasant experience on commercial web site.

From a managerial perspective, exploitation of the present study's findings by e-retailers should contribute to the development of more effective and consumer-friendly e-commerce web site. Our findings confirm the importance of the use of the agent in the improvement of playful and social aspects of a web site. Also, our results suggest that websites with higher social interactivity (i.e. by using ACA) offer a better experiential value for visitors and increase the intention to buy and thus their turnover. Web designers should focus more on the social interactivity of a web site. At the same time it will be interesting to give to the user the possibility to personalize the appearance of the ACA.

Our work is not exempt from limits, in particular participants in our study surfed only one site and searched for only one product category and used only one ACA. The replication of this work on other sites or for other products categories or usage of different type of ACA (e.g. high versus low level of anthropomorphism) would bring a bigger external validity to our results. It would be also interesting in future researches to take into account other users characteristics like internet skills, product category involvement, and level of innovativeness...

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