

Why and How Do the Telepresence Dimensions Influence Persuasive Outcome ?

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Abstract

Research on the relationship between telepresence and persuasion is sparse. Especially absent is research on the specific contribution of each telepresence dimensions (engagement, naturalness and spatial presence) on persuasive outcome. The author proposes a theoretical framework to examine this relationship. She then empirically tests research propositions in a laboratory experiment. The data, collected from a sample of 63 individuals in U.S., indicate that the telepresence factors have a differential influence on global attitude and attitude confidence. The implications of this research for future work are discussed.

Keywords--- **Telepresence, persuasion.**

1. Introduction

Imagine that you are navigating in a desktop virtual environment. This environment is composed of several worlds, oriented to entertainment, education, and so on. One of these worlds lets you the opportunity to enter in a store and make your shopping trip as you do in the “normal” life (walking through the aisles, picking and manipulating some products and so on). Few years ago, this way of online shopping was considered as the future of e-commerce. Indeed, it represented an attempt to integrate in a single tool buyer-seller relationships, experiential transaction, and post-purchase service – in other words, the optimal solution to bring online compelling experience to consumers and to build one-to-one relationships with them. Now some “3D stores” are disappeared and others are transformed in promotional tools for 3D designers and no more in such integrative marketing tools as initially conceive by companies. A reason of such failure was the reluctance of companies to pay a fee for having their online presence via such “sophisticated” desktop interface without knowing if the output will be positive or negative, at which extent, and at which conditions.

Prior research regarding what effects virtuality might have on consumers in a marketing perspective have mainly focused on virtual product experience [1, 2, 3, 4, 5] and on virtual agents [6, 7, 8]. The extant

literature lacks empirical research on the impacts of large virtual environment on consumers’ typical responses to product-oriented message (i.e., affective, cognitive and behavioral) [9, 10, 11]. More specifically, does the commercial virtual environment influence the consumers’ product brand attitude, her/his confidence in this judgment and his/her purchase intention? If any, in what way does this influence occur? Are these global configurations more or less effective than those focally to the product? These questions (and many more) still remain unanswered.

To address the aforementioned issues, marketing-oriented literature concerning virtual reality has often proposed virtual presence (telepresence and/or social presence) as potential facilitator of consumer persuasion. For example, consumers interacting with products in 3D advertising are likely to perceive a sense of telepresence, which results in product knowledge, brand attitude, and purchase intention [4]. An anthropomorphic agent has been shown to increase social presence and telepresence, which in turn have an impact on attitude toward the message transmitted by this agent [8]. Finally, product placements in virtual environments have greater persuasive impacts when telepresence is higher [11]. Telepresence and social presence are commonly conceptualized as multidimensional constructs [12, 13, 14]. However, little is known about the specific contribution of those constructs dimensions on persuasive outcome.

We decide to focus only on telepresence, i.e. the spatial counterpart of the perceptual illusion of nonmediation [12] and not its social counterpart. In this framework, this study aims to examine how telepresence through its dimension (engagement, naturalness and physical space) might enhance consumer persuasion. We first describe the conceptual framework (i.e., the three-factors conceptualization of telepresence, the process of persuasion and the underlying theories). We then formulate hypotheses linking telepresence dimensions and persuasive outcome. Next, we report results from a laboratory experiment. Finally, we propose avenues for further research.

2. Conceptual framework

Our conceptual framework is mainly built on direct experience and source-monitoring error theories. We first define the two core concepts and then present the aforementioned theories.

2.1. Telepresence

We adopt the ISPR (International Society for Presence Research) view of presence:

“subjective perception in which even though part or all of an individual's current experience is generated by and/or filtered through human-made technology, part or all of the individual's perception fails to accurately acknowledge the role of the technology in the experience”.

Presence is thus considered as a psychological construct rather than a technological property of the virtual environment. In this framework, all interfaces (Imax, television, desktop screen and so on) are likely to facilitate some sense of telepresence. However, “immersive” virtual environment created by tools such as head-mounted display and data gloves at this point of time can generate highest senses of telepresence [12]. On the other hand, the term “telepresence” is here preferred to “presence” in order to focus only on spatial aspects and exclude social ones, as mentioned before.

More precisely, telepresence is considered as a three-factors construct. These factors are the following ones [13]:

- Engagement, which refers to cognitive as well as affective aspect, i.e. “in telepresence, as the user focuses more attention on the virtual stimuli (because of the degree of significance or meaning that the individual attaches to the stimuli, activities or events), and due to the potential intrinsically motivating quality of such experience [15], the individual will become cognitively and affectively more involved in it.
- Naturalness, the telepresence reality judgment component, i.e. “in telepresence, the user will perceive the environment as perceptually (photorealistic) and socially (“true to life”) realist to her/him”.
- Physical space, the telepresence spatial-constructive component, referred to the idea of transportation, i.e. “in telepresence the user feels her/his phenomenal body spatially located in the virtual environment and s/he perceives her/himself to be enveloped by, included in, and interacting with the virtual environment and its elements”.

Telepresence is viewed here as a continuous variable in the sense that the degree of telepresence is likely to vary from the peripheral sense of spatial presence to progressively higher levels of telepresence characterized by greater cognitive and affective engagement in the virtual experience.

2.2. Persuasion

In social psychology literature, definitions of persuasion could be either process-oriented or outcome-oriented [16]. The first kind of definitions assumes persuasion as an activity or a process in which a communicator attempts to induce a change in the individual's belief, attitude, or behavior. Therefore, persuasion can occur regardless of whether anybody is actually influenced by a message. In contrast, the second kind emphasizes successful attempt to influence. It does not make sense to state “I persuaded him but failed” [17]. We rather adopt the second view for integrating impacts on people, positive as well as negative ones. Therefore, we use the following definition [18]:

“persuasion corresponds to a communicational act, that aims at modifying the inner state of the individual and, in fine the individual's behavior, in a context in which the individual has some degree of free choice”

In order to predict the extent to which attitudes will change, researchers must understand the underlying psychological processes. For doing so, dual-process models are an attempt to integrate conflicting findings in providing comprehensive framework. The Elaboration Likelihood Model (hereafter ELM) [19] is preferred to all other persuasion models because of its integrative perspective, its empirical validity and its theoretical pertinence. The term « elaboration » in the model refers to the extent to which people think about issue-relevant arguments contained in persuasive message. The model's key hypothesis postulates that the elaboration likelihood moderates the route to persuasion. If the elaboration likelihood is high, the probability that people follow the “central” route to persuasion also will be high. In fact, the ELM outlines two basic routes to persuasion: the central route, along which the person changes her/his attitude on the basis of elaboration on arguments contained in the message and, the peripheral one along which the person may change her/his attitude on the basis of peripheral cues (for instance, receiver attractiveness).

In persuasive outcome, we consider: attitude confidence, attitude richness and purchase intention. Attitude confidence is a cognitive construct that reflects one's conviction in one's beliefs, which may be caused by quantity of information, credibility of information, and consistency of information [20]. Attitude richness refers to “the amount of contextual and sensorial information that accompanies one's attitude in memory” [21], in other words, a knowledge-related construct. Finally, behavioral response is commonly measured through the notion of purchase intention. This measurement is far from perfect because it only captures intentions and not true behaviors, which are very difficult to measure, especially in a laboratory experiment.

2.3. Direct experience effect

In perceiving telepresence, individuals feel their presence in the virtual environment and less and less in

the immediate physical one [22]. Secondly, individuals respond to virtual stimuli like they would do in the reality [12]. For instance, they could have the impression to « really » manipulate a product in a virtual store and thus adopt the same behavior as the one in physical stores. Therefore, telepresence experience is supposed to be located closer to direct experience than to indirect experience on an experience spectrum [1], which might result in the same cognitive and affective consequences on the consumer as those for direct experience.

The way by which attitudes are formed (direct experience or indirect experience) is recognized as an important moderator between attitude and behavior. The distinction between direct experience and indirect experience of an attitudinal object represents a continuum. At one extremity, direct experience designates a behavioural action with the attitudinal object. At the other extremity, indirect experience means the attitude formation through an informational contact with the object such as information reading about this object [23]. For instance, word-of-mouth is very close to indirect experience (i.e., the consumer receives product information but can't touch it) while product trial is a direct experience [23].

Attitudes formed through direct experience have been shown to be more consistent to behavior than those based on indirect experience [19, 24, 25, 26, 27]. Due to effective object manipulation, attitudes based on direct experience are linked with greater elaboration of the merits of the object than attitudes formed through indirect experience like passive exposure [28, 29]. In turn, greater elaboration results in attitude confidence [26, 27]. In the same way (through virtual manipulation and thus elaboration), we assume that both physical space-related and engagement-related components of telepresence are likely to influence attitude confidence. On the other hand, the more the individual will have a "sense of believing" (naturalness dimension), the more s/he will also be confident in her/his judgment toward the environment and/or the objects inside it. In other words, the influence of engagement and of physical space is rather due to elaboration while the influence of naturalness depends rather on familiarity due to manipulation.

2.4. Source-monitoring error

If telepresence experience has the potential to involve users in sensory worlds that are indistinguishable or nearly indistinguishable from the real world, then people have to make sophisticated judgments about what is real and what is not [30], which contributes to source-monitoring error. Source monitoring error assumes that information from fictional source will be encoded with same qualitative characteristics as information from direct experience [20]. In other words, the richness of an attitude formed during a mediated experience is supposed to be high when a source-monitoring error has occurred.

Therefore, the more the user will have the perception of "real" interaction with the virtual environment and/or its elements, and the more the individual will blend information provided by the virtual environment with information from the real world due to her/his impression of naturalness, the more s/he will form attitudes toward the object with rich sensorial and contextual details. In other words, attitude richness is assumed to depend on the telepresence dimensions of physical space and of naturalness. The influence of engagement is not assumed to be explained with source-monitoring error (a more unconscious process).

3. Hypotheses

Based on these theories, we formulate the following hypotheses:

Hyp. 1: Telepresence through its dimension of engagement is likely to positively influence brand attitude confidence and store attitude confidence.

Hyp. 2: Telepresence through its dimension of naturalness is likely to positively influence brand attitude richness, brand attitude confidence, and store attitude confidence.

Hyp. 3: Telepresence through its dimension of physical space is likely to positively influence brand attitude richness, brand attitude confidence and store attitude confidence.

A next study will be needed in order to validate the underlying theories of these relationships.

4. Method

4.1. Experimental design and stimuli

To create variation in telepresence, we produced two commercial virtual stores representing low and high level of social realism (figures 1 and 2). Social realism refers to the extent to which a media portrayal is plausible or "true to life" in that it reflects events that do or could occur in the nonmediated world [12]. Media content and more specifically social realism has been suggested to positively influence telepresence [31, 32, 33]. Social realism is manipulated according to the number of details (not related to the product advertised) and the number of collateral products (18 in the low condition and 69 in the high one) present in the virtual environment.

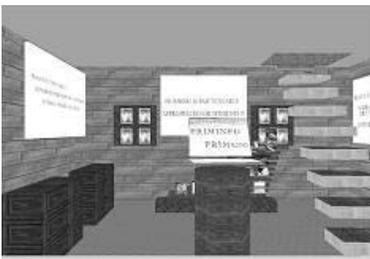
On the other hand, as there were not time limitations for navigation, and due to the differential level of social realism, we expect that users in the low condition will take less time to visit the virtual environment and thus will have less opportunity to perceive telepresence, in comparison with individuals in the high condition.

The stimulus is a quasi 3-D virtual environment that displays an outside view of a computer store. The store has two floors, the first one showing the stimulus product and the second floor being used for video games. Three criteria were used for selecting the focal product: product with geometric properties rather than material ones (i.e., easier to evaluate the central merits of the brand rather

than smell, taste and hearing) and a technologically oriented product (i.e., in order to have congruency between the product type and its placement in an “innovative” environment). Based on these two criteria, the product selected was a notebook computer. Major collateral products were games-oriented products, and therefore not directly related to the notebook computer. Its brand was unknown (i.e., in order to avoid brand familiarity between subjects).



Low level of social realism



The procedure was as follows. The subjects participated in the experiment (approximately 30 minutes) one by one at a time in an “immersive” room (i.e., a small room with a computer surrounded by wood panels). They were told that the study was designed to obtain people’s opinions about computer product presentation in 3D virtual store that was owned by a European company. The subjects were asked to fill in the first part of the questionnaire (demographics and computer usage questions) before training themselves in 3D navigation (in a labyrinth). After visiting the store (without any time limitation), they filled in the questionnaire’s final part to check the manipulation for vividness and to obtain a measure of telepresence, overall attitude toward the brand and the store as well as the confidence in these judgments and finally purchase intention. After one week, they received a short questionnaire by email in order to measure attitude richness concerning the virtual experience.

4.2. Sample

The subjects were 63 undergraduate students of US post-graduate students. They were recruited from communication courses and received extra credit points for their participation. They were randomly assigned to one of the two conditions (in average 30 in each). However a large majority of students who had participated in the experiment came from telecommunication, which imply a very frequent Internet usage, favorable affect toward the Internet and great perceived skills in it. These notions were not significantly different across the groups.

High level of social realism



4.3. Measures

Telepresence was measured using a shortened version of the Independent Commission-Sense of

Presence Inventory (ITC-SOPI) (34 items 5-points scale) [13]. For checking social realism manipulation, two semantic differentials (two seven-point items) [34] were used, adapted to a product and a store.

A measure of Internet experience [35] consisted in asking the total number of hours spent on web, how long ago they first accessed the web, how often they accessed it and whether they felt “at ease” on the web. Virtual reality-related item was added to this scale in order to check the familiarity with 3D navigation. Positive and Negative Affect and Internet self-efficacy tests was grouped as a set of 16 questions (5-points) (for instance, “using the Internet is fun”, “using the Internet is frustrating”, “it is easy for me to use the Internet”).

Global attitude toward the brand was measured with 5 bipolar semantics differentials [36] (for instance, bad/good, high quality/low quality). We created an overall brand attitude measure by averaging these scale responses. 6 bipolar semantics differentials measured the attitude toward purchasing the brand [37] (for instance, foolish/wise, harmful/beneficial). Global attitude toward the store was measured with 12 bipolar semantics differentials [38] (for instance, modern/traditional, outgoing/inward). The other persuasive outputs were attitude confidence (2 seven-points items) [39] (adapted for the product and the store), attitude richness (28 bipolar semantics differentials, Memory Characteristics Questionnaire) [17], and purchase intention (4 bipolar semantics differentials) [40].

5. Results

The social realism manipulation was successful because we get: (1) higher scores in the store social realism scale for the high social realism condition (hereafter HSR) than for the low one (hereafter LSR) ($\text{mean}_{\text{LSR}} = 2,63 < \text{mean}_{\text{HSR}} = 4,71$; $t=-11,298$, $p_1=0.000$), (2) no significant difference between the product social realism scores which has to be at low level ($\text{mean}_{\text{LSR}} = 2,51 \sim \text{mean}_{\text{HSR}} \sim 2,18$), (3) more time spent in the store for the HSR condition than the LSR one ($\text{mean}_{\text{LSR}} = 4,83 < \text{mean}_{\text{HSR}} = 6,62$; $t=5,563$, $p_1=0.000$), and more importantly (4) higher scores in the three dimensions of telepresence for the HSR condition than for the LSR one ($\text{mean}_{\text{engagement/LSR}} = 2,04 < \text{mean}_{\text{engagement/HSR}} = 3,88$; $p_1=0.000$ / $\text{mean}_{\text{naturalness/LSR}} = 1,99 < \text{mean}_{\text{naturalness/HSR}} = 3,94$; $p_1=0.000$ / $\text{mean}_{\text{physical space/LSR}} = 2,06 < \text{mean}_{\text{physical space/HSR}} = 3,9$; $p_1=0.000$).

Brand attitude confidence only depends on the engagement dimension of telepresence (37% of total variance explained). The influence is negative: the more the user will focus her/his attention in the virtual environment, the less s/he will express attitude confidence. Before the experiment, the individual was asked to explore the environment, which leads to allocation of attention to all content elements, and not specifically to the focal product. As a consequence it could be logical that s/he has relatively less focused on the focal product, and thus are less confident in his/her judgment.

Store attitude confidence is only influenced by the physical space dimension of telepresence (30% of total variance explained). We could here assume that due to spatial construction the individual will more appropriate the space, even virtual (i.e., to transform and personalize the space in her/his mind in order to get the impression of control), that leads to more confidence toward this space. Such effect was expected also on the product side, which was not the case, probably due to the poor product design.

As not expected, we found, a positive influence of the naturalness dimension of telepresence on global brand attitude (16% of total variance explained) and on attitude toward purchasing the brand (15% of total variance explained). We could assume that the individual who considers the environment as believable is likely to form favorable attitudes toward the brand and toward purchasing the brand. The hypothesis of possible influence on attitude extremity has to be clarified.

Therefore, direct experience effect could be proposed as an explanation of the relationships between physical space dimension and store attitude confidence, and between engagement dimension and brand attitude confidence, due to possible higher elaboration. However, probably due to poor product manipulation, we didn't found any influence of the naturalness dimension on attitude confidence.

No influence of the three factors on attitude richness was found. A reason of that could be the attitude richness scale, normally used to compare fictional memory and real one and not two mediated experiences.

6. Conclusions

The purpose of this study was to deeper understand the specific contribution of each telepresence dimension on persuasive outcome. This could be particularly interesting in a theoretical perspective but also for companies, which desire to have a presence in quasi 3D virtual stores.

Results about the influence of each telepresence dimensions on persuasion are quite mixed. On the one hand, some persuasive outputs are likely to be influenced by a particular telepresence dimension variation. For instance, the extent to which the individual will judge the virtual environment as close to the reality (i.e., naturalness dimension) will positively influence global attitude toward the brand. On the other hand due to the experimental design characteristics, some relationships are not significant (e.g., the relationship between naturalness and brand attitude confidence). Indeed, the virtual store was not perfectly designed in the sense that some graphics were perceptually and socially realistic but not enough to have a significant impact on attitude characteristics.

The insights given by our study have to be validated in another study, which will take into account design recommendations. However, to our knowledge, our research is the first attempt to empirically examine the effects of telepresence dimensions on persuasion and to

bring theoretical explanations of such relationships. Two linkages should be further investigated: among attitude extremity and naturalness, among store-oriented variables and all telepresence dimensions. Moreover, it could be interesting to clarify if there is any halo effect of the store-related variables on the product-related ones facilitated by telepresence.

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