

Interactive 3D Presentations and Buyer Behavior

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ABSTRACT

This paper shows preliminary results on how interactive 3D product presentations affect buyer behavior in e-commerce applications over the Internet. We conducted two experiments involving simulated online shopping trips, in which subjects saw some products with 3D presentations and made product choices. The results show that the availability of interactive 3D product presentations instead of still images may affect some important aspects of buyer behavior, including the amount of time spent examining products and purchase likelihood.

Keywords

VR, e-commerce, interactive 3D, buyer behavior

INTRODUCTION

A weakness of electronic shopping environments on the Internet is that they prevent customers from physically examining products prior to purchase. Web-based, interactive 3D product presentations (I3DPP), defined as virtual reality applications that allow users to view a product on a desktop computer, permit simulated product experiences and, thus, may be viewed as a partial substitute for the inspection of actual products. From the point of view of interface design for e-commerce, it is critically important to develop a deep and systematic understanding of how consumers use and interact with such technology.

In this paper we present some preliminary findings from two large-scale laboratory experiments in which the availability of I3DPP in online shopping environments was manipulated systematically.

RELATED WORK

Some VR applications have shown shopping-related experiences for consumers, but with few usability studies. Companies are working in this market, such as Cycore[2] or Viewpoint[7], by solving some flaws[6] of the current standard technology like download delay.

Some studies about VR are relevant to e-commerce applications. Examples include studies of spatial knowledge transfer[8], and of VR in standard desktop computers[5]. There are also studies on human behavior in

connection with electronic environments, such as on the relationship between computer-based animation and learning performance[4], the impact of user control over the flow of information on decision making[1], and the effects of interactive decision aids on consumer decision making in electronic shopping environments[3].

However, VR-based e-commerce applications require validation of such findings and answers to new questions. For example, little is known about how useful the interaction with a VR model is to consumers, relative to the interaction with other types of media such as still pictures.

EXPERIMENTS

We conducted two laboratory experiments to examine the effects of I3DPP on user preferences. Each experiment consisted of two simulated online shopping trips where users viewed descriptions of a set of products and selected the subjectively most preferred product.

Experiment 1: I3DPP for All Competing Products

Subjects were 243 business undergraduate students, divided in small groups. The factors manipulated between subjects were the availability of I3DPPs for all products on a shopping trip (AVAIL), the completeness of the textual product description, in terms of the number of attributes listed (COMPL), and the product category (CAT): PDAs or CELLS. In addition, the order of both the AVAIL and the CAT manipulations was counterbalanced across subjects. The dependent variables in this experiment were the task completion time (TIME), consumers' confidence on their purchase decisions (CONF), perceived decision difficulty (DIFF), the likelihood of actually buying the selected product (BUY), and the uncertainty about the quality of the available products (UNCERT)¹.

Each subject completed two simulated shopping trips, one for PDAs and one for CELLS. On each shopping trip, subjects viewed descriptions of three products in the same category, which were presented on separate web pages², and then indicated which of the available products they would be most likely to purchase. Finally, subjects responded to a series of questions about the products and the interface.

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¹ With the exception of TIME, all dependent variables were measured using 11-point rating scales.

² Each page looked like just one product in Figure 2.

Selected results are the shown in Figure 1. Subjects spent more time looking at product descriptions when I3DPP were available ($p < 0.001$) and this effect was stronger when COMPL was low (2-way interaction; $p < 0.05$). With regard to BUY, we found a strong 2-way interaction ($p < 0.01$) between AVAIL and COMPL. The availability of I3DPP had a positive effect on BUY when a small amount of attribute information was available, but a negative effect when the product descriptions were very detailed.

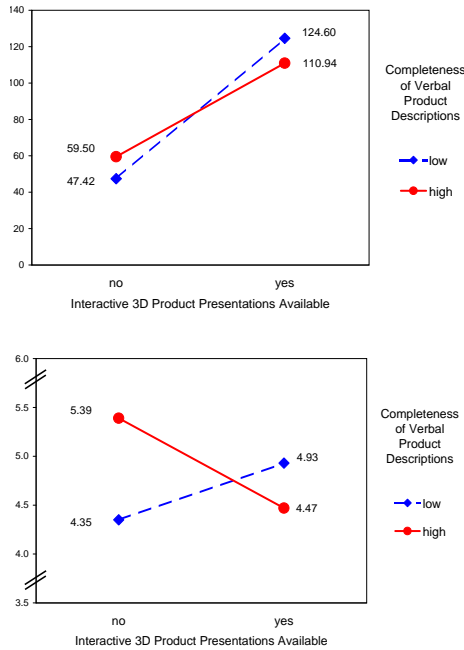


Figure 1: TIME and BUY for experiment 1

Experiment 2: I3DPP for a Subset of Products

Participants in this experiment were 106 undergraduate business students. The manipulated factors were the same as in Experiment 1³. However, the experimental procedure was different: after interacting with a I3DPP of an unrelated product, subjects completed two shopping trips, on which they had to choose for each category between two products, shown side by side (Figure 2). One of the products was available as an I3DPP, while the other was

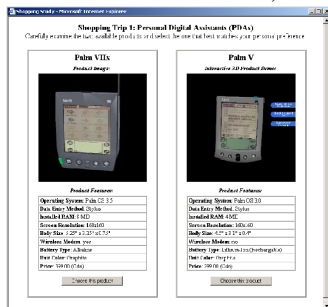


Figure 2: Screen shot from experiment 2.

³ Subjects' prior online shopping experience (PRIOR) was added as a covariate (yes/no).

depicted in a still image. The assignment of actual products to the two presentation formats was counterbalanced across subjects.

A key result of this study is shown in Figure 3: all else being equal, the availability of an I3DPP made a product more likely to be chosen ($p < 0.05$) and this effect was stronger for those who had purchased a product on the Internet in the past⁴ than for individuals without such prior experience (2-way interaction; $p < 0.01$).

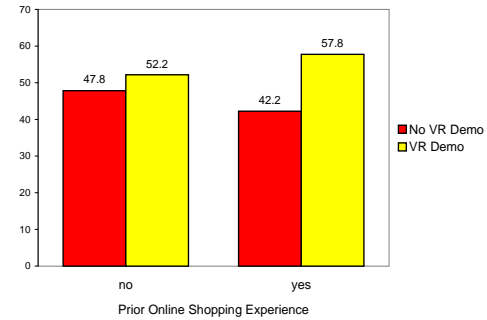


Figure 3: Prior online shopping experience and product choice shares.

CONCLUSIONS AND FUTURE WORK

While I3DPP and VR technologies have the potential to improve the experience of consumers in electronic shopping environments, more research is needed in order to obtain a better understanding of the factors that determine the degree of usefulness of such technologies.

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⁴ About half of the participants in this experiment.