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Effects of Information Overload on Brazilian E-Consumers

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Abstract: Problem statement: E-commerce is a reality; Companies must consider this media as an important trade channel without distances between products and consumers. A key issue of e-commerce is how companies are disclosing information to its customers. This study aims to measure if there is relationship between the information overload in the virtual environment and the response of satisfaction and confusion of consumers. **Approach:** Research had exploratory-experimental character and it was used a quasi-experiment. Due to the methodology adopted, two samples were obtained, the first of control with 114 respondents and the second of experiment with 178 cases reported. Data analysis was made though descriptive statistics (central tendency and dispersion), multivariate (factor analysis) and non-parametric (Mann-Whitney U test). **Results:** A factorial matrix was built and it was found that information overload relates to the responses of satisfaction and confusion in the environment of e-commerce. There was a statistical significance level supporting these relationships. **Conclusion/Recommendation:** The main implication of information load was the feeling of not having done the best buy, generating a possible repentance. Related to the feeling of confusion generated by the large amount of information, the physical and virtual environment has the same properties. The performed analyses in this study indicated that there is a relationship between the e-commerce consumer satisfaction and the experience of information overload. Future studies might investigate the relationship between information overload and other responses.

Key words: Information overload, experimental research, e-commerce, consumer behavior

INFORMATION

During the information search process, when trying to buy a product on-line, the individual is subject to experience the state of information overload, which represents the consumer behavior under the influence of a larger number of information that is beyond capacity to process information[1]. In other words, instead of assisting the decision process, the information becomes confusing.

Information overload can be defined as a condition of being exposed to an excessive amount of information, at such level that enable the individual to process them[3].

The fundamental premise that underpins the overload condition is that consumers have a finite capacity to absorb and process information, in a given period of time[4].

The Information Overload (IO) issue has been studied for decades by[1,3-5]. However, there's still a lack of research about this issue related to the online consumer behavior.

Information overload effects have been already identified not only in consumer behavior but also in other areas, such as financial management[6] and in the health sciences[7].

Prior to focus in the article main issue, it´s necessary to make a distinction between the information load and information overload. Information load refers to a variety of stimuli that individual should respond[8].

Some studies proposed to investigate an ideal level of information that would optimize the buying process[9-11]. Six alternatives is a ideal number for the consumer final buying decision without suffering the information overload effects[9]. Bettman[10], however, argues that the ideal number is five options, demonstrating that there is no uniformity of points of view on this process. It is important to note that these findings may not represent the current reality, especially when online consumers, who routinely deal with large amounts of information are considered.

The information overload phenomenon may occur in two ways: Brands or attributes overload[5]. The first

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occurs when the consumer is facing a situation which has several brands of similar products (alternatives) and will choose only one. In this scenario, the information number on the attributes of brands is limited, but the excess of brands to be analyzed features an information overload. The second situation considers a scenario with a small number of brands available, but a lot of information about the attributes of the products or services.

One of the major challenges of marketing is the difficulty in managing the distortion between mental model and the real image of the product or service, because consumers struggle distinguishing the difference between multiple stimuli that they receive.

Jacoby *et al*.[1] studies have revealed correlations between amount of information, satisfaction and confusion response. It was also observed that, being in a state of information overload, consumer has less ability to choose the "best" brand.

The conclusions reached by previous studies are diverse and often contradictory. Some researches indicate that by increasing the number of information, there is greater satisfaction among consumers, while others say that this relationship is inversely proportional[1,12].

Aware for these differences, Malhotra[4] proposed that others aspects of information should be considered in conducting researches, as the attribute variation (not only alternatives) and the relevance measurement of information for the purchase decision.

Researches have shown some distortions because consumers are influenced by the (in) satisfaction with the store overall performance and not only with the information overload[13].

The "better" purchase concept was adopted by Jacoby *et al*.[1] through the measurement of which product characteristics consumers considered most relevant when buying a product. In the complementary study to its previous experiment, Jacoby *et al*.[1] confirmed the findings and emphasized that as much information available on the pre-purchase stage may result in poor decisions. Also, observed in this experiment, that individuals may feel more satisfied and more certain of the chosen product, even when they are not doing the "best" purchase.

Considering the above, the main objective of this article is represented into the following question: is the information overload experience related, in some way, to the satisfaction and confusion responses in the e-commerce environment?

Therefore, the objective of this research is to measure whether there is a relationship between the information overload in the virtual environment when buying a product, the consumer's satisfaction and confusion response.

MATERIALS AND METHODS

This research is explanatory in nature, therefore consists of a quasi-experiment[14,15]. The explanatory research is characterized by deliberate manipulation of some aspect of reality to be investigated. This type of study is used to obtain evidence of cause and effect relationships. The causality may be inferred when, between two or more variables, there is a concomitant variation and correct order of occurrence of the variables and when the other possible factors are eliminated[16].

In quasi-experiment, which characterizes this study, rules of the experiment are maintained with significant changes: There is no random draw of the persons or group of respondents[17], there is no environment total control[16] and the situation that the experiment will be applied is not similar to all groups[18].

There are two groups in the quasi-experiment study: the Experimental Group (EG) and the Control Group (CG)[16].This experiment technique was chosen to supply a lack of realism employed in the information overload preliminary studies[1].

The methodological procedures used by researchers in this area converge to the use of an information framework, where the alternatives (lines) and attributes (columns) are presented. The alternatives are hypothetical and the participants responded to certain questions that measured their behavior[1].

Diverging with the classic line of research, other methodologies have also been adopted, such as cards alternatives[4] and commercial television[12]. The use of a commercial website (scenario) as environmental laboratory in this research brought greater realism to the study. A reproduction of a virtual store is accessible, implies low costs, reduced production time and in theory, there should be no discrepancies between the fictitious shops of the experiment and the real ones.

Another advantage of using the experiment in the information overload research area is the control of odds variables such as store environment performance (design, color, sound ...), which, according to Anderson *et al*.[13], may cause distortions to the final outcome of the studies.

Two proposals have been drawn up based on the theory. There is a studies convergence that show, on the effect of the information overload, consumers feel more confused[2,4,12,13,19] and less satisfied[12,13,19].

This way, we proposed that: The information overload is related with the e-commerce consumer

confusion response; the information overload is related with the e-commerce consumer satisfaction response. In both cases, it happens when purchasing a product on-line (mobile phones).

Data analysis: There are three major profiles in this analysis. Since it was used two groups (control and experimental) it is necessary to reveal the characteristics of each respondent. Finally, the general characteristic of the sample is also presented, because it is possible to identify what the distance between the average respondents profile and features founded in each group.

It is important to stress that the data was treated before analysis. The dubious answers or blank data were computed as lost. Being stored, however, they were not used for calculations. The questionnaires with many incidence values and without answers were cancelled.

The amount of 114 valid questionnaires was obtained from income of approximately U$ 550,00 (59.7%), with more than 6 years of Internet access (38.6%) and 2 h frequency daily connection (32.5%).

The experiment group, was composed by 178 respondents, which the average profile is formed by men (56.2%), aged between 18 and 25 years (66.3%), individual income of approximately R$ 1,000 (48.3%), with more than 6 years of Internet access (38.2%) and 2 h frequency daily connection (27%).

Once the samples were collected from different environments and times, the proximity of the average profile shows a strait relationship between the samples.

For a better understanding of the scale behavior, a reliability of Cronbach test was done. On the group related to satisfaction, the control group obtained a 0.634 Cronbach's, while the confusion related group, a 0.648 index. For the experiment group, was observed an alpha of 0.686 and 0.767 related respectively to the satisfaction and confusion measurements.

The factor analysis related to the experiment group obtained a KMO of 0.717 with 91 degrees of freedom significant to 0.000. The Bartlett Chi-Square test found was 605.452. The variance explained is 43.496%. The group obtained through this analysis confirmed the previous studies. The items were loaded in accordance with the original scale of Jacoby *et al*.[2].

The items taken from factorial analysis were added by the method of regression. This technique estimates that all values of average zero and from the variance between the calculated responses of fact and the estimate, new values are given to the variables that will be added to compose the latent factor.

In accordance with the test result U of Mann-Whitney, the studied theoretical relations indicate that information overload impacts satisfaction and the confusion feeling during the purchase. When compared, Satisfaction obtained an adjusted Z of 7.368, 0.000 significance; while Confusion obtained a adjusted Z of 5.117 and 0.000 significance.

Therefore, both the study proposals were confirmed. There is a relationship between information overload experience and e-commerce consumer satisfaction and confusion response, when buying products on-line.

RESULTS

The theoretical model proposed shown by Fig. 1 contains the dependent variables (cause) and the independent variables (effect). The statistical test chosen to perform the testing of hypotheses was the multiple regressions. It was chose because there is only one independent variable (amount of information) and three dependent variables (satisfaction, confusion and purchase decision). When there is a dependent variable (Y) according to another independent (X), there is a regression. If the relationship between them is expressed by an equation of the first degree, where the graph is a straight line, this is name-mined linear regression[16].

Table 1 shows the assumptions verbatim, the statistical techniques used to test these and the specific objective that was achieved with each.

Table 1: Hypothesis

	Hypothesis	Statistic test
H1	Consumers of e-commerce feel themselves in an information overloaded state when they are in front of 10 or more information ate same time.	Mann-Whitney
H2	Consumers of e-commerce do not feel themselves confusion in information overloaded shops.	Linear regression
H3	Consumers of e-commerce feel themselves more satisfied inside information overloaded shops than normal shops	Linear regression
H4	Consumers of e-commerce do not purchase in information overloaded shops	Linear regression
H5	There is a relationship between confusion and satisfaction of the e-commerce consumers in an information overloaded shop	Linear regression
H6	There is a relationship between confusion and purchase decision of the e-commerce consumers in an information overloaded shop	Linear regression

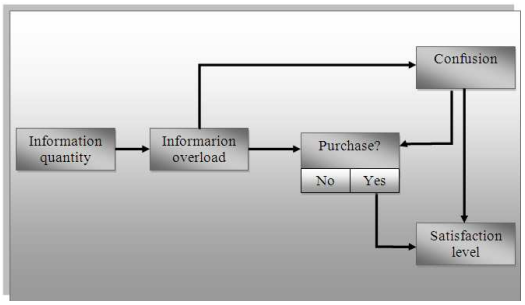

Fig. 1: Proposed model

Table 2: Spearman's test results

Variables	Information quantity	Purchase decision	Satisfaction	Confusion
Information quantity	1	-0.037	-0.121	-0.157*
Purchase decision	-	1	-0.268**	0.330*
Satisfaction	-	-	1	-0.049
Confusion	-	-	-	1

Before regression, it is advisable achieve a correlation with the variables involved in order to understand the behavior of these[20]. Table 2 shows the Spearman correlation for non-parametric samples carried out. Items marked with an asterisk were significant lower than 0.050, while the item is marked with two asterisks the significance value of less than 0.001. According to the analysis there is a relationship between the amount of information and amount of purchase (as expected in hypothesis H1) and between responses and the decision to purchase. The other relationships were not significant. Through the analysis of correlations was determined that the method used to regression is the stepwise, because of the variables not significant to the model will be excluded (Spearman's test showed that this might will happen).

The overload of information was tested as follows: the independent variable of the model is dichotomous, 1 for the experimental group (high amount of information) and 2 for the control group (low amount of information). Of the three dependent variables, satisfaction and confusion were measured by the scale adapted from Jacoby *et al.*[2]. The decision to purchase was measured by the variable generated by the question: If you needed a cell phone, you buy some of the options for this site? Multiple regression analysis was then performed and the results of this can be shown in Table 3. Only the hypothesis H3 showed no statistical significance, the others were confirmed.

The theoretical model tested is shown by Fig. 2. The dotted line represents the relationship not statistically significant (H3), the straight positive significant relationships (H1, H4) and dashed negative significant relationships (H2, H5, H6).

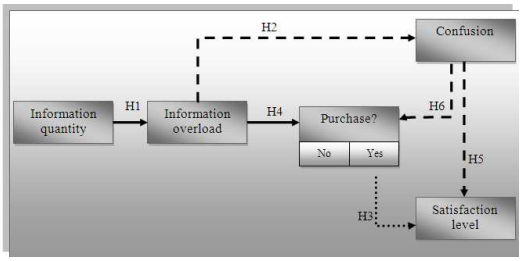

Fig. 2: Model results

Table 3: Regression results

Hypothesis	Independent variable	Dependent variable	T	beta	Sig.	R^2 adjusted
H2	Information quantity	Confusion	-3.144	-0.215	0.002	0.034
H3	Purchase decision	Satisfaction	-1.702	-0.121	0.090	0.096
H4	Information quantity	Purchase decision	4.940	0.311	0.000	0.082
H5	Confusion	Satisfaction	-2.068	-0.169	0.041	0.144
H6	Confusion	Purchase decision	-5.089	-0.416	0.000	0.144

DISCUSSION

Noting the outcome of statistical tests, the answer to the research question 'how overload of information relates to the confusion, customer satisfaction and purchase decision on online purchases?' can be answered. The IO is the virtual environment as well as in the traditional environment and the quantity of information is crucial for the emergence of this phenomenon.

From theorized relationships, only the satisfaction is not related to the information overload state on e-commerce. The level of satisfaction with the purchase, however, is affected indirectly through the confusion and it is an inverse relationship. It was found that when the occurrence of IO, the consumer of electronic retail feels less confused, contradicting studies in traditional environments.

Thus, it is understood that the increase in the amount of information is beneficial to Internet users, therefore, using a linear reasoning, the overload information reduces the confusion that often consequences, increases satisfaction.

The negative point is regarding the decision to purchase. In the environment it have information overloaded consumers are less likely to be decided by the acquisition of products, an inverse relationship was also observed between purchase decision and confusion.

Thus, the results of this study indicate that the IO is to be positively related to the purchase, negatively with the confusion and indirectly positively with satisfaction in the retail electronics environment.

CONCLUSION

The first observation which should be made is that the phenomenon of information overload exists and can be identified in virtual environments, as noted in the physical environment by previous studies.

The state of confusion over the purchase decision from an experience information overload has been identified by various authors in the traditional environment[1,2,12,13,19,21].

Using this same line of thinking, which consumer will feel confused due to the inability to process all the information present[12], the idea that there is a link between the information overload experience and this kind of response was proposed in this study.

The main implication of this response to the investigated phenomenon is the feeling of not having done the best buy, generating a possible repentance, corroborating, thus, with Jacoby *et al.*[2] studies. Related to the feeling of confusion generated by the large amount of information, the physical and virtual environment has the same properties.

According to the literature reviewed, satisfaction levels vary with the addition of information in the traditional purchase environment[4,12,13,19].

The performed analyses in this study indicate that there is a relationship between the e-commerce consumer satisfaction and the experience of information overload, confirming the second proposition of research.

These findings contribute to the study of virtual marketing in order to provide a basis for studies of this type of consumer. Also, the web designers earn subsidies to consciously manage the amount of information in the construction of e-commerce virtual pages.

It is possible to conclude that the main response to information overload is the confusion, through it; you can explain the behavior of satisfaction and decision to purchase in virtual environment. Figure 3 shows graphically the relationship.

There is no theoretical basis to relate directly satisfaction with the purchase and OI due to the wide divergence of previous studies[22,24] and the lack of statistical significance in relation directly between these variables observed in this research. However, when measured for the confusion, it is reasonable to consider that there is an increase in levels of consumer satisfaction in connection with the overload of information in virtual environments.

The non-random character of this study does not allow generalizations of results and the lack of literature in the area of information overload on the Internet and especially in Brazil, represent an obstacle to the development of their studies.

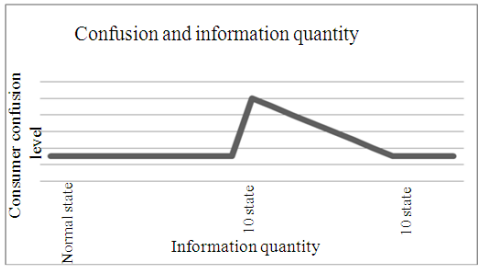

Fig. 3: Confusion and information quantity relationship especially in Brazil, represent an obstacle to the development of their studies

It is known that consumer phenomena are complex events. So it is recommended to future researches to investigate the relationship between information overload state and other responses.

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