PSICO
v. 42, n. 4, pp. 527-535, out./dez. 2011

The effects of different configurations of online recommendation agents on consumers' buying decisions

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ABSTRACT

This study investigates the effects of different configurations of online recommendation agents on consumers' buying decisions. 104 on line consumers of clothing participated in our study (66.3% female) answering to an online questionnaire displaying different configurations of recommendation agents. Against the assumption that a large number of choices would lead to information overload and demotivate consumers (Iyengar and Lepper, 2000; Scheibehenne et al., 2008), this article shows that participants are more motivated to search for a product and more willing to buy from a website with a recommendation agent displaying a larger number of products (16), compared with a smaller number (4),and are more motivated to search for a product and more willing to buy from a website displaying 16 products at once instead of four at a time. Based on the fuzzy-trace theory (Reyna, 2008), we argue that information overload do not play a role here because people tend to reason on the basis of simplified representations (gist) rather than on the literal information available (verbatim). Also, compared to the absence of brands, the presence of brands increases the motivation to search for a product and the willingness to buy. These results can be explained by the fact that brands, like stereotypes (Janiszewski and Osselaer, 2000; Keller, 2003), help people to form the gist of the information being displayed (Brainerd and Reyna, 2005).

Keywords: consumer behavior; recommendation agents; decision-making; motivation; willingness to buy.

RESUMO

Os efeitos de diferentes configurações de agentes de recomendação online na tomada de decisão do consumidor

Este estudo investiga os efeitos de diferentes configurações de agentes de recomendação online na tomada de decisão do consumidor. 104 consumidores online de roupas participaram desse estudo (66,3% do sexo feminino) respondendo a um questionário online que apresentava diferentes configurações de agentes de recomendação. Contrariamente à noção de que um grande número de escolhas levaria a uma sobrecarga de informações e desmotivaria os consumidores (Iyengar e Lepper, 2000; Scheibehenne et al., 2008), esse artigo mostra que participantes são mais motivados à pesquisar por produtos e mais dispostos a comprar de um web site com um agente recomendador que apresenta 16 produtos comparado com 4 produtos e são mais motivados à pesquisar por produtos e mais dispostos a comprar de um web site que apresenta 16 produtos de uma vez ao invés de quatro de cada vez. Tendo como base a teoria do traço difuso (Reyna, 2008), nós argumentamos que a sobrecarga de informações não afeta as escolhas porque as pessoas tendem a raciocinar com base em representações de essência ao invés de com base em informações literais. Ainda, a presença de marcas aumenta a motivação em pesquisar por produtos e a disposição em comprar produtos recomendados. Esses resultados podem ser explicados pelo fato de que marcas, assim como estereótipos (Janiszewski e Osselaer, 2000; Keller, 2003), ajudam as pessoas a extrair a essência da informação sendo exposta (Brainerd e Reyna, 2005).

Palavras-chave: comportamento do consumidor; agentes recomendadores; tomada de decisão; motivação; intenção de compra.

RESUMEN

Los efectos de diferente configuración de agentes de recomendación en línea en la toma de decisión del consumidor

Este estudio investiga los efectos de diferentes configuraciones de los agentes de recomendación en línea en las decisiones de compra de los consumidores. 104 consumidores la línea de ropa participaron en nuestro estudio (66,3% mujeres) respondiendo a un cuestionario en línea mostrando diferentes configuraciones de los agentes de recomendación. En contra a la suposición que un gran número de opciones podría conducir a una sobrecarga de información y desmotivar a los consumidores (Iyengar y Lepper, 2000; Scheibehenne et al., 2008), este articulo muestra que los participantes que son más motivados a la búsqueda de un producto en un sitio web y mas dispuestos a comprar un gran número de productos (16), en comparación con un pequeño número (4), son más motivados a buscar

un producto y más dispuesto a comprar en un sitio web con un agente de recomendación que presenta 16 productos a la vez en lugar de 4. Basándose en la fuzzy-trace theory (Reyna, 2008), nosotros argumentamos que la sobrecarga de información aquí no juega un papel importante porque las personas tienden a razonar sobre bases de representaciones simplificadas (esencia) en lugar de información literal disponible (literal). Además, comparando la ausencia de marcas, la presencia de marcas incrementa la motivación para buscar un producto y el deseo de compra. Estos resultados pueden ser explicados por el hecho que las marcas, como estereotipos (Janiszewski y Osselaer, 2000; Keller, 2003), ayudan a las personas a la formación de información de esencia (Brainerd y Reyna, 2005).

Palabras clave: comportamiento del consumidor; agentes de recomendación; toma de decisión; motivación; disposición de compra.

INTRODUCTION

It is not always an easy task for consumers to find their preferred product online. Large, disorganized and pulverized product assortments can sometimes overwhelm consumers because they often have limited time resources to cope with huge amounts of information. Therefore, online shopping can be a difficult and time-consuming activity. However, there are different kinds of tools to help to make the search process toward large assortments easier for the consumer (Felfernig et al., 2007). Interactive decision aids are tools that assist and facilitate consumers' buying decisions in an online shopping environment (Häubl and Trifts, 2000). One of the tools that consumers often see on online environments is the recommendation agent, which – as the name implies – is a mechanism that recommends products to the consumer, often showing product images at the bottom or side of the webpage. Online retailers use this technology-mediated marketplace to help consumers to find the desired product and, consequentially, to increase profits. Using some information of the shoppers, such as profile, demographics and/or past purchases, these technology systems can infer information about the features of available products that meet the profile preference of the shoppers and "recommend" products to them (Towle and Quinn, 2000). Due to this, consumers can potentially reduce the invested time associated with the decision-making. Therefore; the majority of online stores uses recommendation agents to facilitate the shopping decision process (Punj and Moore, 2007). In summary, in an online shopping environment consumers are less restricted by the availability of product information, although they have limited time resources to go through all that to find the information they need; but they still can sort their preferences with the help of recommendation agents that uses consumers' interests and preferences as an input to model personalized products recommendation alternatives as an output (Häuble and Murray, 2001).

Recommendation agents seem to be an important element for many online retailers, they usually spent a lot of effort to build this mechanism for their websites, despite the fact that it can be costly (Leavitt, 2006). In addition, if online shoppers are unwilling to take the suggestions of the recommendation agent, the efforts spent on the development of a recommendation agent could become in vain (Wang and Doong, 2010). Since setting up a successful recommendation agent is not easy and the design of the recommendation agent on a website can affect consumers' preferences (Gentry and Calantone, 2002; Häuble and Murray, 2001), it is important to understand the effect of different configurations of recommendation agents on consumers' behavior while shopping online.

While previous studies were focused on online recommendation agents of sectors such as electronics (Häuble and Trifts, 2000), music (Huang and Zeng, 2005) and red wine (Senecal and Nantel, 2004), this study focuses on the apparel sector. Previous studies investigated the advantages and disadvantages of the tool (Häuble and Trifts, 2000; Punj and Moore, 2007; Senecal and Nantel, 2004), whether it increases the sales (Leavitt, 2006) and different types of recommendation agents (Felfernig et al., 2007; Felfernig et al., 2008; Häuble and Trifts, 2000; Melville et al., 2002; Sarwar, 2001; Schafer, 2005; Schafer et al., 2007; Smyth, 2007). In this research we build on previous literature investigating the effects of different configurations of online recommendation agents on consumer behavior. Specifically, we manipulated the number of recommended products being displayed (four; 16); the configuration of displayed products (16, four at a time; 16 all at once) and the presence or absence of brands associated to the products being displayed on the web site. We measured the effect of our manipulations on consumer's satisfaction with the recommendation agent,

motivation to search for information and involvement with the online recommendation agent.

Lin and Wang (2008) list three factors that influence the effectiveness of online recommendation agents by online consumers: personalization, trust, and the technology acceptance model (TAM). Internet personalization is about to tailor individual information, such as services and content of the preferences and behavior of consumers. Also, Internet personalization increases the awareness of consumers to the items (or services), which persuade them to make online purchases. Furthermore, personalized information affects consumers more than non-personalized information. Trust refers to trustworthiness of the online recommendation agent. The constructs that are anticipated by TAM are perceived usefulness (consumers' belief that the technology can reach their preferences, needs and wants) and perceived ease of use (consumers' belief that the technology is easy to use). Ultimately, the recommendation system is a success if the consumer takes the advice and eventually buys the recommended product (Jian et al., 2009). The recommendation agent uses customer's purchase history and identifies products the customer may purchase (Senecal and Nantel, 2004; Bodapati, 2008). Furthermore, Bodapati (2008) argued that the recommendation decision-making should not be based on the purchase probability, but it should be based on the sensitivity of purchase probability due to the recommendation action. However, according to Jian, Shang and Lui (2009), a recommendation agent is truly successful if it also maximizes consumers' after sale satisfaction, because consumers are more satisfied with this recommendation agent than with a recommendation agent that simply attracts consumers into the act to buying the recommended products. Nevertheless, sometimes the suggested items that the recommendation agent displays do not match with the needs and wants of the customer. If a consumer is in a situation where he or she cannot find an acceptable product, then they will switch to another retailer. To try to keep customers satisfied, retailers use recommendation agents that may suggest that the selection criteria be personalized, and could also display available alternatives (Punj and Moore, 2007). By using the latter recommendation agent, closest matches are found to the selection criteria and it also give to consumers valuable feedback on the available alternatives. These recommendations may help consumers cope with the aforementioned situation, by learning more about other product options available. At the end, the task of recommendation agents is to make online shopping attractive and to make the matching process function efficiently when presenting various products, helping to find the product that best fits consumer's needs (Punj and Moore, 2007).

According to Iyengar and Lepper (2000), the amount of choices have an impact on the consumers motivation to search for information; they show that too many varieties of products of the same category may demotivate consumers. For example, some stores offer over 300 varieties of a given product. It is attractive to have many choices, but this may lead to consumers getting confused about the choice they have to make and it may have negative consequences for consumers' motivation to search. Their research was run in a grocery store and has indicated that extensive choices may affect consumers' satisfaction and motivation. For some products, consumers like to have lot of choices, such as chocolates, but on some products (e.g. jams) it may not be desirable. These two differences could be explained by the fact that chocolates are hedonic goods and jams are utilitarian goods (O'curry and Strahilevitz, 2001). Some authors found similar results in choices among other products as the previous theory, such as research based on chocolates (Chernev, 2003), pens (Shah and Wolford, 2007), coffee (Mogilner et al., 2008), and gift boxes (Reutskaja and Hogarth, 2009). Iyengar and Lepper (2000) also argue that consumers can like extensive choices because they enjoy the decision making process. However, they feel more frustrated about the many choices. This leads consumers to be more dissatisfied, regretful and disappointed about the choices they had made compared to the consumers with limited choices. The reason is that by exhibiting extensive choices, people are unsure. In other words, an extensive choice assortment may lead to a decrease in motivation to choose and the satisfaction with the finally chosen product (Iyengar and Lepper, 2000).

Some researchers argue that due to a large assortment of recommended products, consumers may have a feeling of information overload, which is when their choice criteria have become too wide (Scheibehenne, Greifeneder and Todd, 2008, 2010). However, contrary to the notion that people struggle with large amounts of information due to their limited working memory capacity, the Fuzzy-Trace Theory (FTT) predicts that people form two kinds of mental representations: verbatim and gist (Reyna, 2004). Verbatim representations are detailed and precise but become inaccessible quickly over time. Gist representations are categorical, based on bottom-line meaning, and remain robust over time. According to the theory, people tend to reason on the basis of simplified representations rather than on the literal information available; therefore, FTT predicts independence between working memory capacity and reasoning

(Dougherty and Hunter, 2003; Mills, Reyna, and Estrada, 2008; Reyna, 1991; Reyna and Adam, 2003;). Furthermore, apparel is a hedonic product (Park et al., 2011), therefore we hypothesize that a recommendation agent displaying a larger number of recommendations for apparel would motivate consumers to search for information and to buy the recommended products; given that the amounts of choices have expanded, but in an organized way (facilitating gist extraction).

The Elaboration Likelihood Model (ELM) explains the attitude changes and how they are formed (Petty and Cacioppo, 1986). The elaboration continuum is central to ELM, which ranges from weak (unconsciously) to very strong (consciously). Depending on the degree of the merits of an advocacy; different processes affect the final persuasion or attitude. The ELM distinguishes two different routes to persuasion: central route and peripheral route. Processes that run through the central route require a high degree of attention (intended message). This occurs when a person considers an idea logically. When a person is not motivated or able to evaluate the merits of an advocacy, then this person is following the peripheral route. This occurs when a person's attitude is affected by relying on simple decision rules (heuristics) that allow them to evaluate the advocacy quickly (Petty and Cacioppo, 1986). Brands evaluations can fit into those simple decision rules. Brand is a critical factor in stimulating the online purchases (Corbitt et al., 2003). According to Senecal and Nantel (2004), consumers who consult the online recommendation agent that recommends a brand will have a higher motivation to select that brand than one who does not consult the online recommendation agent. Brands can be seen as an organized cognitive structure consisting of product perceptions and brand preferences; this structure can facilitate the choice process (Bahn, 1986). The basis for most consumer buying decisions is the act of differentiating and choosing among products and brands. Brands play a role in the consumer decision-making process through the identification of products and their main characteristics (Dawar and Parker, 1994). Consumers tend to categorize goods into groups to facilitate decision-making. For example, an initial and very broad categorization of products would be to form classes for tops and pants; these initial classes would be divided further into individual products such as t-shirts and jeans; then next step for the categorization could be at the brand level, forming brand categories within a particular product class, such as Levi's and Diesel for the class jeans for example. Products and brands are categorized as described to facilitate the information processing (Bahn, 1986). According to FTT gist memories are colored by inferences, attitudes, and stereotypes (Brainerd and Reyna, 2005). Stereotype is a salient gist or meaning that compels intuition (Wolfe and Reyna, 2010); brands could also be seen this way. In some situations, individuals are naturally inclined to rely on summary, stereotypical brand perceptions. This top-down processing is different from bottom-up processing, which involves close scrutiny of product attributes in order to form evaluations (Alba and Hutchinson, 1987; Dimofte and Johansson, 2009). Since brands can lead to inferences, attitudes and stereotypes (Janiszewski and Osselaer, 2000; Keller, 2003), they can help the gist processing and consequentially, aim decision-making. Based on the previous assumptions, we expect that if a brand is presented by the recommendation agent, consumers will be more motivated to search for a product and more willing to buy a recommended product than if a brand is not presented.

METHOD

Participants

104 participants answered to an online questionnaire. The majority of the participants were females (66.3%). There is not an age difference between the sexes: the average age for women is 26.3 (SD = 6.0) and for men 26.4 (SD = 5.4). The majority of subjects were students (35.6%) or students with a part time job (29.8%). 31% of the respondents' have a monthly income smaller than 500 euro and 28.8% between 501 and 1000 euro. Furthermore, 43.3% of respondents spend online on clothes between 101 and 500 euro per year. The only necessary characteristic of subjects to participate in our study was that they were on line consumers of clothing. Because on line consumers are found easily in the general population, it was a convenience sample, gathered through a snowball technique applied on an online social networking.

Material and procedure

A focus group (n = 8) was held in order to get the necessary information to build the questionnaire used for the experiment. A pre-test was run to ensure that the questionnaire used for the experiment was working as it should be. Then, an online survey was conducted in order to investigate the role of the different configurations of a recommendation agent on consumers' purchase decisions.

After signing the informed consent, participants of both genders answered to a very similar questionnaire, the only differences between versions were the pictures, one showing male clothes and the other female clothes. The pictures used as the stimuli in these questionnaires

were taken from the web shop www.asos.com. We edited print screens of the web site according to our manipulations. Before answering the questionnaire, participants had to indicate their gender, then the website showed the corresponding questionnaire to the participant. The questionnaire started with a short introduction, informing the participants what this study was about and explaining the concept of online recommendation agent.

Then, participants saw three different configurations of a hypothetical online recommendation agent displaying 4 items, 16 items at once and 16 items four at a time. The first questions were about motivation to search for information. Seven point Likert scales from "not at all motivated" to "strongly motivated" were used to measure motivation to search for a product (e.g. How motivated are you to search for a product when using a recommendation agent displaying 4 products (Picture 1)?). Right after, participants answer about their willingness to buy. Seven point Likert scales from "totally disagree" to "totally agree" were used to measure willingness to buy (e.g. I Would buy at least one product from the recommendation agent displaying 4 products (Picture 1).).

After this, participants saw two different configurations of a hypothetical online recommendation agent displaying 4 items each, one displaying product brands and the other not displaying product brands. Then, participants once more answered about their motivation to search for a product and their willingness to buy from those two configurations of online recommendation agent. Finally, participants were asked to fill in demographics questions.

We used one-way repeated measures ANOVAs to analyze the data. Post hoc power analysis were conducted using the software package, G*Power (Faul, Erdfelder and Buchner, 2007). The sample size of 104 was used for the statistical power analyses. The effect sizes in this study ranged from .18 and .64 (see results section). The alpha level used for these analyses was $p<.05$. The post hoc analyses revealed the statistical power for this study between .88 and .99. Thus, there was more than adequate statistical power to find an effect assuming that one exists in the population (Cohen, 1992).

RESULTS

A Pearson correlation analysis was performed in order to investigate the effects of the factors combinations: (1) motivation to search out of a recommendation agent that displays 4 products and the willingness to buy recommended products for apparel of this agent, (2) motivation to search out of a recommendation agent that displays 16 products 4 at a time and the willingness to buy recommended products for apparel of this agent and (3) motivation to search out of a recommendation agent that displays 16 products at once and the willingness to buy recommended apparel products of this agent. Our results indicate that these three factors combinations are positively correlated with each other and are all significant ((1) $r=.66$, $p<.001$; (2) $r=.66$, $p<.001$;(3) $r=.77$, $p<.001$). As a result, consumers' motivation to search out of a recommendation agent that displays 4 items, 16 items 4 at a time and 16 items at once are positively related with the willingness to buy recommended products for apparel.

Moreover, we ran ANOVAs in order to compare the motivation to search for a product according to the number of recommended products being displayed (4 items and 16 items). When a recommendation agent displays 16 items, participants are more motivated to search for information ($M=3.98$, $SE=.19$) than when it displays 4 items ($M=3.34$, $SE=.17$) (Figure 1). The main effect of the motivation to search for a product is significant, $F(1, 102)=4.37$, $p<.05$, $r=.18$. Furthermore, the willingness to buy from a recommendation agent displaying 16 items is higher ($M=3.71$, $SE=.18$) than when it displays 4 items ($M=2.59$, $SE=.16$) (Figure 2). The main effect of willingness to buy is significant, $F(1, 102)=20.40$, $p<.001$, $r=.40$.

We ran ANOVAs analyses to compare the motivation to search for a product according to the configuration of displayed products (16 items at once and 4 at a time). When the recommendation agent displays 16 items at once, participants are more motivated to search for a product ($M=3.98$, $SE=.19$) than when displaying 4 at a time ($M=3.35$, $SE=.15$) (Figure 3). The main effect of motivation to search is significant, $F(1,102)=6.56$, $p<.01$, $r=.23$. In addition, the willingness to buy from a recommendation agent displaying 16 items at once is higher ($M=3.71$, $SE=.18$) than when displaying four at a time ($M=2.83$, $SE=.15$) (Figure 4). The main effect of willingness to buy is significant, $F(1,102)=17.51$, $p>.001$, $r=.37$. The results of these analyses indicate that participants are more motivated to search and prefer to buy from more choices above fewer choices. Furthermore, they are more motivated to search and prefer to buy from an agent displaying 16 items at once, instead that 4 at a time.

A Pearson correlation analysis was used to compare consumers' motivation to search out of a recommendation agent not displaying brands and a recommendation agent displaying brands on the willingness to buy. As a result, these analyses show

significantly positive results around the same value for both variables: motivation to search for product of a recommendation agent not displaying brands and willingness to buy recommended products of this agent is positively related, r=.71, p<.001. Motivation to search for a products of a recommendation agent displaying brands and willingness to buy recommended products of this agent is also positively related, r=.70, p<.001. Also, ANOVAs analyses were conducted to compare the means of the two factors. From these analyses, we can say that participants are more motivated to search for information from a recommendation agent that presents brands (M=4.16, SE=.13) than from a recommendation agent not displaying brands (M=2.96, SE=.14) (Figure 5). The main effect of branded recommendations related to the motivation to search for a product is significant, F(1, 102)=61.84, p<.001, r=.61. In addition, participants are more willing to buy from a recommendation agent that presents brands (M=3.86, SE=.14) than from a recommendation agent not displaying brands (M=2.71, SE=.14) (Figure 6).

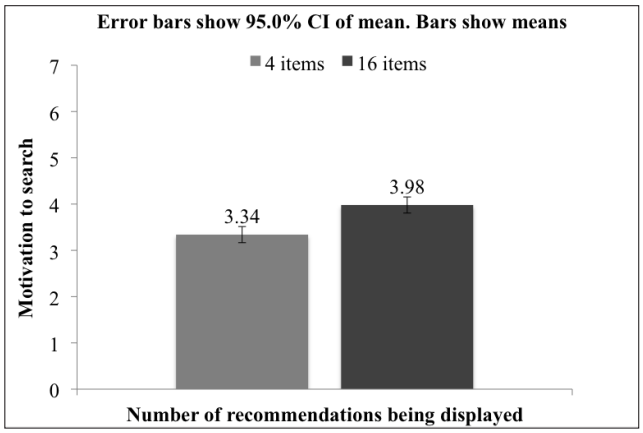

Figure 1 – Number of recommended products being displayed (4 items and 16 items) and the motivation to search.

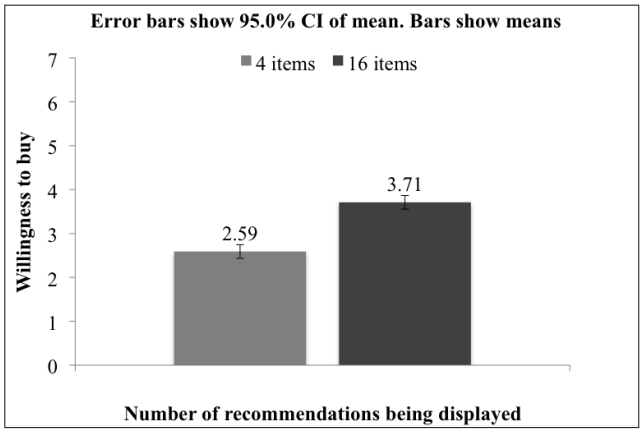

Figure 2 – Number of recommended products being displayed (4 items and 16 items) and the willingness to buy.

The main effect of branded recommendations related to the willingness to buy the recommended products is significant, F(1, 102)=75.19, p<.001, r=.64.

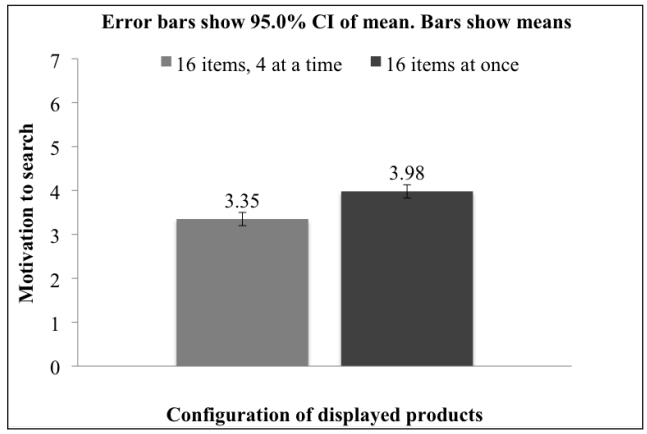

Figure 3 – Configuration of displayed products (16 items, displaying 4 at a time and displaying16 items at once) and motivation to search.

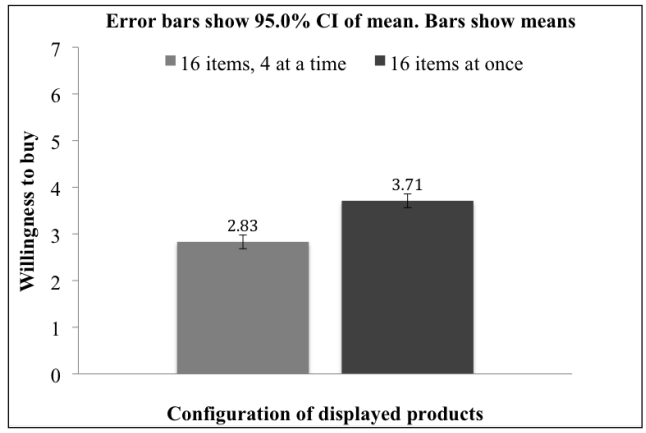

Figure 4 – Configuration of displayed products (16 items, displaying 4 at a time and displaying16 items at once) and willingness to buy.

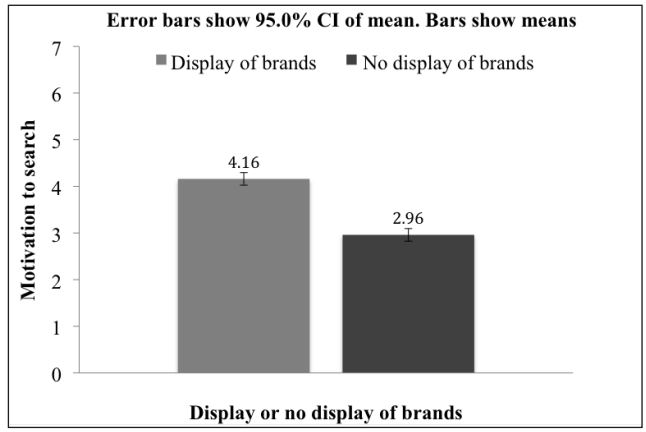

Figure 5 – Display or no display of brands and motivation to search.

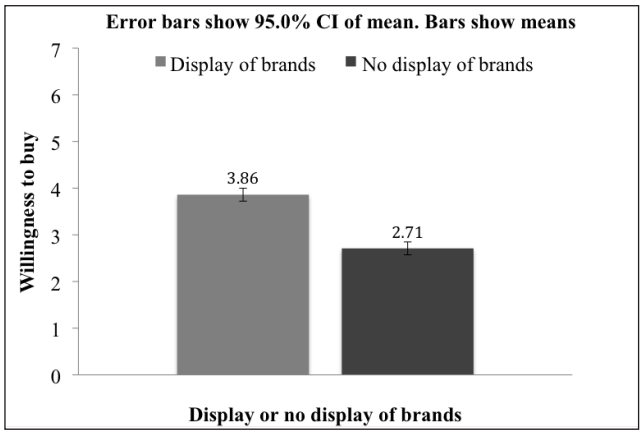

Figure 6 – Display or no display of brands and willingness to buy.

DISCUSSION

The task of recommendation agents is to make online shopping attractive and to make the matching process function efficiently when presenting various products, finding the preferred product that best fits consumer's needs (Jian, Shang and Lui, 2009; Punj and Moore, 2007). According to Jian, Shang and Lui (2009), a recommendation agent is truly successful if the consumer takes the advice and is willing to buy the recommended product, and if it maximizes the consumers' after sale satisfaction.

This research adds new information to the marketing literature. Also, our results showed a positive effect between consumers' motivation to search out of a recommendation agent displaying a large number of recommendations (where an online recommendation agent displays 16 items instead of four) and the willingness to buy the recommended products for apparel of this agent. Iyengar and Lepper (2000) and Scheibehenne, Greifeneder and Todd (2008) argue that a large number of choices could demotivate consumers. However, demotivating consumers due to many choices is not confirmed in this study. In this study, as we expected, the results show a positive effect for a recommendation agent displaying a large number of recommendations on participant's motivation and willingness to buy. Specifically, participants prefer to buy recommended products from a recommendation agent displaying a large number of recommendations (16) than from a recommendation agent displaying a small number of recommendations (four). Furthermore, the participants of this study prefer to see all 16 products at once instead of four at a time. Our results are therefore not in line with the study of Iyengar and Lepper (2000) that suggests that too many varieties of products of the same category may demotivate consumers. As we expected, participants did not struggle with large amounts of information due to their presumed limited working memory capacity, preferring fewer choices to a larger set of choices (Dougherty and Hunter, 2003; Mills, Reyna and Estrada, 2008; Reyna, 1991; Reyna and Adam, 2003) given that the amounts of choices have expanded, but in an organized way, facilitating gist extraction (Reyna and Adam, 2003). We speculate that the type of product may also be playing a role. Consumers like to have many choices when shopping for clothes, since apparel can be seen as a hedonic product such as chocolates (O'curry and Strahilevitz, 2001). Another explanation could be that this correlation exists due to the sample characteristic. The majority of the sample is around the age of 26. According to Reed et al. (2008), young adults like to have many choices, while older adults prefer less choice.

A positive relationship between consumers' motivation to search out of a recommendation agent displaying brands of apparel and the willingness to buy the recommended products is confirmed by the results. Previous research (Corbitt et al., 2003; Lachance et al., 2003; Senecal and Nantel, 2004) also showed a positive relationship between motivation to search from branded recommendations and willingness to buy. This is confirmed by our results, consumers appear to prefer to follow the peripheral route, using brands as a heuristic to facilitate the decision process (Petty and Cacioppo, 1986). However, in this study the results showed that there is also a positive relationship between consumers' motivation to search out of a recommendation agent without the presence of brands and the willingness to buy. We speculate that this correlation exists due to the design of the question in the survey, since branded recommendations and not branded recommendations are presented next to each other in one screen in the survey. However, the presence of brands leads to a higher motivation to search for a product and a higher willingness to buy a recommended product than the absence of brands.

The proper design of an online recommendation agent is very important to keep online consumers motivated and willing to buy (Gentry and Calantone, 2002; Häuble and Murray, 2001). The findings of this study can help online retailers recognize consumers' preferences towards different configurations of recommendation agents. In this study, consumers prefer to choose from an agent displaying a large number of recommended products for apparel. Also the presence of brands is favorable. By implementing a satisfying recommendation agent, consumers will be more

motivated and this increases the willingness to buy recommended products (Jian, Shang and Lui, 2009).

Future research could use a more elaborate method design, running an experiment using an actual interactive shopping website with a real online recommendation agent simulating a real shopping experience instead of a static image. It would be very interesting to design an apparel website with a sophisticated recommendation agent tool to investigate the effects of different configurations of online recommendation agents on consumers' purchase decisions. This would be a valued improvement to the study because it could access participants' real shopping behavior while using an online recommendation agent. It would be possible to observe participants actual shopping experience rather than ask for their self-report of their behavior intentions. Another direction for future research would be to investigate other configurations of an online recommendation agent. Also, many previous studies have investigated different product types in the recommendation agent research, for example computer mouse, calculators and red wine (Senecal and Nantel, 2004), backpacking tents and compact stereo systems (Häuble and Trifts, 2000) and digital cameras (Komiak and Benbasat, 2004). Therefore, an improvement for this study would be to replicate this study by using different product categories.

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Recebido em: 15-11-2011. Aceito em: 23-12-2011.

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