

Intention of green consumption in the context of the selfish or altruistic features of the product versus the user's environmental consciousness

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Abstract

This research analyzed the relationship between the different motivations of green consumption in the context of a product with selfish and/or altruistic characteristics, given the different levels of environmental awareness and its impact on consumer behavior. For this, explanatory research, of quantitative character, was carried out using the realization of an experiment with the scenario of social values and individual consciousness for the method. The results showed that the motivation from the perspective of environmental concern, which proposes an altruistic consumption, had a greater influence on the practice of green consumption when compared to the motivation of the social perspective (fad and individual positioning), which in turn proposes selfish consumption. The data also showed that for the technological elite the social value provided by consumption, whether by its normative perspective or social status, does not influence the practice of green consumption. Finally, the research showed that the level of environmental awareness is an important antecedent of the intention to use green products, in which users with a higher level of environmental awareness have a greater intention to consume. However, it was possible to identify a large gap between the prediction of use and the current use of green products for consumers.

Keywords: Green consumption. Consumer behavior. Motivation and environmental consciousness.

Intenção de consumo verde no contexto de características egoístas ou altruístas do produto versus a consciência ambiental do usuário

Resumo

Este estudo analisou a relação entre as diferentes motivações do consumo verde no contexto de um produto com características egoístas e/ou altruístas, dados os diferentes níveis de consciência ambiental e seu impacto no comportamento do consumidor. Para tal foi realizada uma pesquisa explicativa, de caráter quantitativo, que utilizou como método a realização de um experimento do cenário dos valores sociais e da consciência do indivíduo. Os resultados mostraram que a motivação na perspectiva da preocupação ambiental, que propõe um consumo altruísta, influenciou em maior intensidade a prática do consumo verde quando comparada à motivação da perspectiva social (modismo e posicionamento individual), que, por sua vez, propõe um consumo egoísta. Os dados também demonstraram que para a elite tecnológica o valor social proporcionado pelo consumo, seja por sua perspectiva normativa ou pelo *status* social, não influenciam a prática do consumo verde. Por fim, a pesquisa comprovou que o nível de consciência ambiental é um importante antecedente da intenção de uso de produtos verdes, na qual usuários com maior nível de consciência ambiental têm maior intenção de consumo, embora também ter sido demonstrado a existência de uma grande lacuna entre a predição de uso e o uso corrente de produtos verdes para consumidores.

Palavras-chave: Consumo Verde. Comportamento do Consumidor. Motivação. Consciência Ambiental.

Intención de consumo verde en el contexto de las características egoístas o altruístas del producto contra la conciencia ambiental del usuario

Resumen

Este trabajo analizó la relación existente entre las diferentes motivaciones del consumo verde en el contexto de un producto con características egoístas y/o altruístas, dado los diferentes niveles de conciencia ambiental y su impacto en el comportamiento del consumidor. Para ello, se realizó una investigación explicativa, de carácter cuantitativo, que utilizó como método la realización de un experimento del escenario de los valores sociales y de la conciencia del individuo. Los resultados mostraron que la motivación en la perspectiva de la preocupación ambiental, que propone un consumo altruísta, influyó con mayor intensidad la práctica del consumo verde en comparación con la motivación de la perspectiva social (modismo y posicionamiento individual) que, a su vez, propone un consumo egoísta. Los datos también demostraron que para la élite tecnológica el valor social proporcionado por el consumo, sea por su perspectiva normativa o por el *status* social, no influyen en la práctica del consumo verde. Por último, la investigación comprobó que el nivel de conciencia ambiental es un importante antecedente de la intención de uso de productos verdes, en la cual los usuarios con mayor nivel de conciencia ambiental poseen una mayor intención de consumo, aunque también se ha demostrado la existencia de una gran brecha entre la predicción de uso y el uso corriente de productos verdes para consumidores.

Palabras clave: Consumo verde. Comportamiento del consumidor. Motivación y conciencia ambiental.

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INTRODUCTION

Over the last two decades (1997-2017), consumers have been exposed to technological scenarios related to environmental contexts and the concept of sustainability (OTTMAN, 2011; BARBOZA and ARRUDA FILHO, 2012), which led to an increasing perception of environmental awareness, and consumers are demonstrating more appreciation for green products (GERSHOFF and FRELS, 2015; ARRUDA FILHO and BRITO, 2017; MEDEIROS and RIBEIRO, 2017; DANILECKI, MROZIC and SMURAWSKI, 2017).

Recent discussions and communications of products in the market have disseminated green values, observed in sharing services such as laundries, carpool services, and car and house sharing (KIECKHÄFER, WACHTER and SPENGLER, 2017; JOSHI and RAHMAN, 2015; JANSSEN and JARGER, 2002). Thus, there has been an increase of sustainable products (KUMAR, MANRAI and MANRAI, 2017; JELSMA, 2003; HEISKANEN, KASANEN and TIMONEN, 2005; BARBIERI, VASCONCELOS, ANDREASSI, et al., 2010), which has led to more consumers having sustainable/green experiences. The diffusion of green products influences changes in society, introducing moral aspects and the “sense of guilt,” which are spread by the media, and promoted by policies and programs to encourage companies committed to socio-environmental development and green values (IYER and RECZEK, 2017; JELSMA, 2003).

The diffusion of green values and green products has reached markets that, in a preliminary and superficial analysis, are not related to environmental protection or sustainability, such as the market for high-tech products. This segment presents a new trend: to add green attributes to products, i.e., to include a convergence with multiple functions in a single device (ARRUDA FILHO and BRITO, 2017). In this scenario, little research has been conducted on consumer behavior in relationship with green technological products. One study, by Barboza and Arruda Filho (2012), shows value perception regarding technology products with “green” integration/characteristics as a bonus for the consumer (KUMAR, MANRAI and MANRAI, 2017).

During this period in which the environmental and sustainability awareness gained prominence, there has been an impressive growth in the consumption of cell phones (the best-selling and widespread technology in the last ten years) in Brazil. A study by the World Bank shows that in 2005, 59% of the households in Brazil had a cell phone and in 2011 this percentage grew to 92% (ONUBR, 2012). Research conducted by the consulting firm IDC showed that in the second quarter of 2013, 8.3 million smartphones were sold in Brazil, which corresponds to a 110% increase in the number of such devices in comparison with the same period of 2012 (TANJI, 2013).

This new technological concept of integrating products in the same platform and providing multiple functions in one device has originated the so-called all-in-one products (NUNES, WILSON and KAMBIL, 2000; LEE, LEE and GARRET, 2013), which have become indispensable in people's daily lives. In this environment, the new generation of cell phones (smartphones), introduced functions associated with pleasure and fun (OKADA, 2005), which are described as ‘hedonic’ attributes and contrast with the other functions of smartphones focused on work and study, considered ‘utilitarian.’ The utilitarian and hedonic attributes influence the “sense of guilt” in consumer behavior, where the consumer finds in the utilitarian attributes the justification to help to cope with such feeling.

This advance in technology introduced a novelty in the market of telecommunications, the mobile applications, which are executable software of free or paid access and available in virtual stores of each cell phone operating system. The proliferation of smartphones has made these applications part of people's lives in a new and unexpected way.

This study analyzes smartphone applications to verify the trends for the new market niche of “green” characteristics in technology products, contributing to the emergence of new contexts in technology. This study also fills a gap in research, considering that most of the research in this field, when considering the “green” attribute, looks at the telecommunication company as study object and few studies have addressed this matter based on the consumer behavior. In this context, the consumer has an important role in influencing corporate environmental responsibility, since they have the power to impel the companies to adopt responsible management by making conscious purchasing choices, looking at improving the society as a whole.

Therefore, this study aims to contribute to this discussion from a better understanding of consumer behavior tendencies towards green products or products with green characteristics. The research studies the consumers' motivations and interests and the role of the level of environmental awareness of this green consumption. The research question is:

- How do the different motivations of green consumption, its intentions (selfish or selfless), and the different levels of environmental awareness influence the intended use and current use of green technology products?

The study evaluated the consumers' intention to use green technological products with social status, in relationship with the consumers' level of environmental awareness. Also, the research observed the consumers' intention to use green technological products with solely environmental characteristics, in relationship with the consumers' level of environmental awareness. Finally, the current use of green technological products in comparison to their prediction of use was evaluated.

These evaluations seek to clarify the influences between the motivations of green consumption and the consumer's intention to purchase since this topic is still little discussed in the literature when considering the technology scenario. On the other hand, the relationship between a) the level of environmental awareness; and b) putting into practice the discourse of "green and responsible" (observed in the consumer's behavior), has been discussed academically, but without consensus (MORAES, CARRIGAN and SZMIGIN, 2012).

As for the methodology, this is a quantitative research based on building experiments. The respondents were divided into four groups according to the manipulation of two variables: different values of green characteristics (social/status and sustainable/responsible) and environmental awareness levels (low and high).

This article presents, after this introduction, a section with the research's theoretical framework addressing the main topics and concepts adopted. Section three presents the methodology and procedures undertaken, describing aspects of the data collection and analysis. Section four describes the scenarios and results obtained in this experiment, which was adapted from previous research we conducted, where the data collected did not meet the purpose. After adjusting the model used in our previous work, new field research was necessary, offering the findings presented here. Finally, we present the conclusions and suggestions for future research.

INTENTION TO USE FOR TECHNOLOGICAL PRODUCTS WITH GREEN CHARACTERISTICS

The theoretical framework presented in this section is divided into two sub-items. The first one discusses aspects that influence the consumer to practice behavior considered 'sustainable.' The second presents theories that seek to explain the behavior of the consumer of technology and their preferences, in addition to presenting the hypotheses created from the literature studied.

Motivations of green consumption

According to Portilho (2005), green consumption reflects the consumer's concern in including the environmental awareness as a variable, together with the variables price and quality, in their purchase decision-making process (SILVA, 2012). Therefore, the concept for 'green consumption' adopted in this research is that of the consumption that focuses on the perception and preference of the consumer only for products that have 'green' attributes (KUMAR, MANRAI and MANRAI, 2017).

As for the notion of 'conscious consumption,' it suggests a change in behavior beyond environmental concerns, including the impacts of consumption and its social effects (SILVA, 2012). Thus, conscious consumption is the result of an intention for green consumption, seeking products and services that currently impact the environment less than other products in the market (JOSHI and RAHMAN, 2015; MEDEIROS and RIBEIRO, 2017). Finally, the sustainable consumption encompasses all the social actors involved from the beginning of the production chain, from use/consumption to disposal (SILVA, 2012, IYER and RECZEK, 2017). Both the conscious and the sustainable consumption are not addressed in this research, which is limited to observing green consumption, because it is easier identified as a practice in consumer behavior.

According to Lin and Chang (2012), the main reasons that motivate consumers to adopt practices of green consumption are related to the perspective of environmental concern, the perspective of economic rationality, and the social perspective.

Consumers influenced by the perspective of environmental concern seek a real benefit to the environment in the products they consume. The environmental issues mediated by their level of consciousness directly impact their lifestyle, buying behavior, consumption pattern and buying habits (GELLER, 1989; BAMBERG, 2003; PUROHIT, 2012; DANILECKI, MROZIC and SMURAWSKI, 2017). The constant conflicts caused by environmental causes have led to the emergence of a new consumption model guided by the desire for a better world, reflecting a moral obligation (KUMAR, 2011; KUMAR, MANRAI and MANRAI, 2017).

The consumers engaged in green consumption based on the perspective of economic rationality, value the economic benefits in their purchases (TRIVEDI, PATEL and SAVALIA, 2011). For example, the purchase of electronic products of low electricity consumption is connected to an economic motivation instead of an environmental concern, considering that these products will cause less impact on the consumers' utility bills (DANILECKI, MROZIC and SMURAWSKI, 2017).

As for the consumers influenced by the social perspective, the motivation lies in social norms (GOLDSTEIN, CIALDINI and GRISKEVICIUS, 2008), culture (SCHAEFER and CRANE, 2005), and social status related with green consumption, resulting in a feeling of differentiation from other people in addition to personal image/status (GINKGO et al., 2011).

However, there are groups of consumers that are not moved toward green consumption by the motivations presented above. They are skeptical and do not believe in the companies' sustainable practices or in the characteristics proposed by the green products (LEONIDOU and SKARMEAS, 2017). As this context of sustainability are not evident and effective for these consumer groups, they present resistance to purchase and influence negatively the process of consuming green products (KOZINETTS, 2008; AUTIO, HEISKANEN and HEINONEM, 2009).

Another issue discussed continuously in academic research that has been considered 'under construction' in literature, is the relationship between the selfish or altruistic intention of green consumption. Although green consumption must be related to an altruistic, and thus more collectivistic intention, several studies have shown that this behavior is related, in a number of research, to a selfish consumer motivation, related to the personal context and gain that each may have (MAGNUSSON, ARVOLA, HURSTI et al., 2001, 2003; MCEACHERN and MCCLEAN, 2002; SNELGAR, 2006; ARRUDA FILHO, CARDOSO and BARBOZA, 2017). For example, in the case of the use of public transportation bearing in mind the goal of reducing costs with cars, fuel, and parking, instead choosing public transportation because of solidarity commuting, and avoiding the environmental damage caused by the individualistic attitude of driving alone in their car.

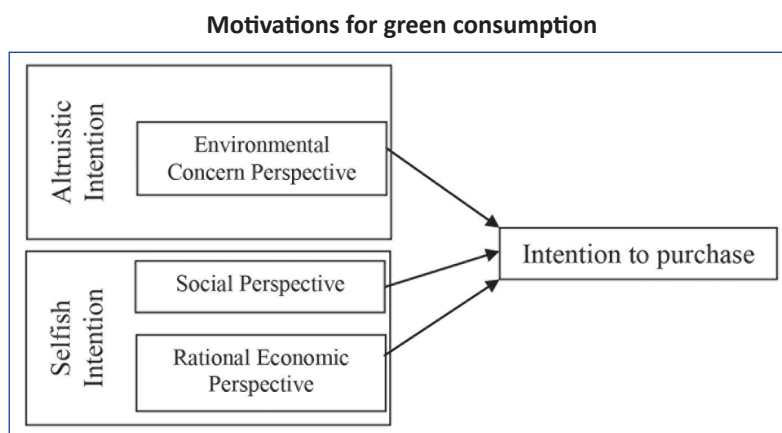
There are also consumers who engage in environmental protection in an altruistic way, adopting collectivist values geared towards the development of society as a whole (ARRUDA FILHO, CARDOSO and BARBOZA, 2017). In technology, there is a new concept of altruism, the 'digital altruism,' presenting consumers who act online in conscious ways, and companies proposing actions to meet this new scenario and the consumers' demand.

This study adapted the model by Arruda Filho, Cardoso and Barboza (2017) (Figure 1), seeking to organize the concepts that influence green consumption based on consumers' behavior and consumption experiences. The key scenario developed in this study is the same as that proposed by Arruda Filho, Cardoso and Barboza (2017). However, the conceptual context for the social perspective was modified for this research, as well as the scales used for the scenario exposing the selfish context. The context of the research conducted by the authors had the social perspective as a value-focused on the evident scenario of shared use, whereas this research used the discussion about the individualistic idea of status and the position that a consumer has in their social group.

In this proposition, the other variable in the study would be environmental awareness as an altruistic intention. It describes a more conscious purchasing behavior, even though in the altruistic intention there is the conflict between believing in the environmental commitment related to the green product and the limited ability to be sure of this commitment. This conflict exposes a gap between the discourse and the attitude of the consumers (JOSHI and RAHMAN, 2015; MEDEIROS and RIBEIRO, 2017).

However, there are already studies describing a relationship between the level of conscious consumption and its reflex in the consumer's behavior, in a conscious way (SCHLEGELMILCH, BOHLEN and DIAMANTOPOULOS, 1996; PUROHIT, 2012), even though other research shows groups where it is possible to observe flaws between discourse and practice (WEIGEL, 1983; HINES, HUNGERFORD and TOMERA, 1986; SPADA, 1990; SIX, 1992; SCHAN, 1993; ECKES and SIX, 1994; BAMBERG, 2003; MORAES, CARRIGAN and SZMIGIN, 2012).

Figure 1



Source: Arruda Filho, Cardoso and Barboza (2017).

This discussion evidences that there is great academic relevance in the research proposal, in terms of understanding behavioral variables. These variables are part of a current and convergent consumption context about concepts of environmental awareness and conscious behavior, when the environment involves an individualistic (selfish) or collectivist (altruistic) scenario (YANG, HSEE and URMINSKY, 2013; JÄGEL, KEELING, REPEL et al., 2012).

Technological consumption preferences

Technology has taken over the current market with integrations and convergences in several sectors, diversifying the applications and thus generating a consumption need focused on the multifunctionality and mobility capacity obtained in the all-in-one devices (NUNES, WILSON and KAMBIL, 2000, SELA and BERGER, 2012). The value perception regarding the use of multifunction devices is directly linked to the number of integrations in a single product, leading to greater use (NUNES, 2000; LEE, LEE and GARRETT, 2013; SELA and BERGER, 2012).

Convergent products are identified by their capacity to perform several functions in a single device (GILL, 2008), from single device simultaneous integrations such as camcorders, mp4, mp3, internet connection, access to e-mails, downloading of programs, music and services (FUNK, 2004; SELA and BERGER, 2012) as observed in tablets and smartphones.

Utilitarian characteristics are among those that influence the consumer to purchase. These are characteristics understood as rational and related to usefulness, including educational functions and work-related tools (HIRSCHMAN and HOLBROOK, 1982; SLAMA and SINGLEY, 1996).

Hedonic characteristics are particularly important in the process of influencing consumption, offering functions for the users' leisure and pleasure (OKADA, 2005; GEMSER, JACOBS and CATE, 2006), which can be translated into fun to use, or enjoyment associated with social status, provided either by being seen using the product or by having something modern and new (ARRUDA FILHO, CABUSAS and DHOLAKIA, 2008). Access to social networks, games, video cameras and mp3 players on smartphones are examples of hedonic features embedded in technology products.

Katz and Sugiyama (2006) demonstrated that cell phone users understand their devices as important elements of their day to day life, in the form of fashion accessories, revealing their personality and generating social value. The intrinsic social factor of these products corresponds to a self-reference of the consumers, perceived as the way in which the society sees them. Therefore, the product is perceived as an extension of the person (BELK, 1988; SOLOMON, 2008) and, due to the technology, this possibility of identification with the object of consumption has never been so evident (BELK, 2013).

In this technological scenario, online social networks have emerged and occupied a large amount of people's time. These networks constitute groups or spaces on the internet that allow the sharing of data and information, which are general or specific in the most diverse forms, such as photos, texts, files, and videos. According to research by Hitwise Serasa Experian (a company that provides information on the interaction of people on websites), online social networks account for 62% of

the Brazilian Internet traffic (NANNY and CAÑETE, 2012), which means they represent one of the most important forms of personal and professional relationship between people.

These social networks have offered a new form of interaction through the convergence of products in real-time online communication, considering the mobility and integration via mobile devices such as cell phones and tablets. Peluchette and Karl (2010) have shown that the content uploaded on online social networks has the primary goal of portraying an image of how people would like to be seen by others. This does not always correspond to their reality, and their desire to be socially accepted leads people to post content considered professionally inappropriate. This social approval is highly important for such individuals, especially for young people.

The research by Christofides, Muis and Desmarais (2009) ratifies this search for social approval, proving that the main factor influencing content dissemination in social networks is the quest for popularity. The need to belong to a social group and to gain popularity are key elements in young people's lives (SANTOR, MESSERVEY and KUSUMAKAR, 2000). For this population, the benefit in popularity obtained when publicizing personal information on the internet overshadows the risks that disseminating such information may represent (CHRISTOFIDES, MUISE and DESMARAIS, 2009).

Therefore, assuming that the technological approach is currently the most used and discussed topic, this research analyzed a mobile and sustainable social network, run through an application (app) with green characteristics integrated to the mobile device. The social network fits the dynamic represented by the gain in social status (popularity) offered for the consumer using the app, and the analysis seeks to evaluate the contribution of this integration in the device.

The analysis is based on the hedonistic and utilitarian values existing in the attributes of the technological products, particularly the mobile apps presented, and these values are well studied in the literature that demonstrates the link between the value motivating the consumption and the use of the product. Thus, it is important to point out that these values are not inseparable poles, they are often characteristics that blend and are found in the same products, as observed in multifunctional smartphones.

Also, it is worth emphasizing that both hedonic and utilitarian values have a directly proportional influence in the intention to use technological products. This relationship, however, is still not fully explained when it comes to green products, and investigating this relationship in new contexts raises significant information to help to understand the preference and practices of green consumption of technological products.

As for the sense of guilt when purchasing hedonic and expensive products, it is often minimized/justified by the utilitarian attributes in the device purchased (OKADA, 2005; DAHL, HONEA and MANCHANDA, 2005; GILL, 2008). Therefore, the theories blend and sometimes add up to a contextualization of consumption and desire, in order to meet a need or explain a desire.

Green consumption, when related to technology, may be subject to double stimulation, building a selfish motivation for consumption (MAGNUSSON, ARVOLA, HURSTI et al., 2001, 2003; MCEACHERN and MCCLEAN, 2002; SNELGAR, 2006). First, the sense of guilt may be related to environmental responsibility, leading to green consumption (consciousness). Second, the sense of guilt may be related to a purchase based on hedonic attributes (social status), guilt originated from the lack of rationality in the decision making, driven by the experiential environment of desire and pleasure in using the product (ARRUDA FILHO, CARDOSO and BARBOZA, 2017). This consumption describes scenarios of personal gains, thus characterized as selfish.

In addition, there is the context in which the sustainable social network's main characteristic is to generate an individual benefit in terms of popularity for the consumer, unlike the application whose main characteristic is a more rational purchase, expressing concern with the society as a whole, i.e., an altruistic benefit.

There is also a scenario in which several authors argue that the relationship between the level of conscious consumption and its influence on consumer behavior is weak or even non-existent, revealing the gap between discourse and practice (ECKES and SIX, 1994; BAMBERG, 2003; MORAES, CARRIGAN and SZMIGIN, 2012). However, other study scenarios describe that consumers with a higher level of environmental awareness are encouraged to exhibit consumer behaviors that are more oriented towards sustainable values (SCHLEGELMILCH, BOHLEN and DIAMANTOPOULOS, 1996; PUROHIT, 2012) and others are skeptical about this process (LEONIDOU and SKARMEAS, 2017).

Thus, the first and second hypotheses to be verified were:

- **H1:** Consumers with a low level of environmental awareness increase their intention to consume green technologies when these products have apparent social characteristics.
- **H2:** Consumers with a high level of environmental awareness increase their intention to consume green technologies, regardless of other characteristics of the product.

In the behavioral aspect related to emotional or rational characteristics, consumers have a preference for hedonic products, when the products are arranged individually and without comparison. When the hedonic product is compared to a rational and utilitarian alternative, the guilt leads to the choice of the utilitarian product (OKADA, 2005). Therefore, the third hypothesis was:

- **H3:** The 'selfish' context influences more the consumption of green technologies than the altruistic context, according to how emotional and rational environments are arranged in the decision-making process.

The prediction of use with convergent products is overestimated because of the complexity brought by the multifunctionality, which makes it confusing and difficult to determine the rationality of use considering the characteristics present in an integrated product. This increases the consumers' perception of future use (NUNES, 2000) since they do not recognize the previous experiences of their consumption, taking familiarity for real knowledge about the use of the product in the past (HOCH, 2002). The multiple features integrated into a device increase the users' value perception. Thus, the users tend to seek more stimuli toward the multiple uses, in comparison to what they would seek for a single device (BARBOZA and ARRUDA FILHO, 2012).

Therefore, prediction of use is increased when compared to the regular use of each characteristic of the product, which offers justification for a new consumption, considering that the consumer believes that the new device/service will bring greater daily usability. Based on this context the fourth hypothesis to be verified was:

- **H4:** Consumers have a low current use of green products and a high intention of use and prediction of use. This expectation of high use of the product in the future is related to the expectation of using the product's integrated characteristics which the consumer did not have before or never had the interest in using.

Thus, the analysis of the hypotheses presented seeks to explain the relationship between the different motivations of green consumption, the different levels of environmental awareness and their impact on the intention to use and the current use of green technological products.

The experiment presented in the next section was developed in order to contemplate the consumption analysis based on the concepts of social and environmental values in the intention of purchasing or using green technology.

METHOD

The experimental methodology was used in this research. An adaptation of the research model developed by Arruda Filho, Cardoso and Barboza (2017) was adopted, replicating and expanding the experiment of the authors.

The data was collected through a closed questionnaire prepared in the survey website zoomerang.com. The questionnaires were sent to a mailing list with online addresses of undergraduate and graduate students from the University of Amazonia (UNAMA), which was chosen for convenience. This university, located in the northern region of Brazil, had about 20,000 undergraduate and graduate students at the time of the data collection. A large number of students guaranteed a diversified profile of participants, considering the multiplicity regarding culture, age, experience, and other characteristics. The marketing research carried out did not have a significant sampling, but a theoretical measurement proposition of the research design, considering that we did not use a more comprehensive sample covering the rest of the country.

Respondents were divided into two groups, and each group received a different stimulus. Participants were unaware of the existence of the other groups or stimulus. This type of online research has academic recognition because of the impartiality and noninterference of the interviewer in the results. The data collected was then treated and analyzed using SPSS software, version 19.

The target public was young university students, known as tech elite, considered one of the most significant segments of the population for technological products. According to Solomon (2008), they have strong technological know-how with constant use of cell phones and the internet and are known as "multitaskers," i.e., they can focus on several things at once, such as

sending a text message and accessing social networks on one device. This tech elite is named as such due to being the first to adopt and use these products, taking active roles in disseminating their use to others groups (HORRIGAN, 2003; KULVIWAT, BRUNER II, KUMAR, et al., 2007). A research work by Instituto Box 1824 states that the age group 18 and 24 years old form a center of influence, in which new behaviors arise and are diffused for other age groups through the aspirational influence of the younger and inspirational for the older population (INSTITUTO BOX 1824, 2012).

Participants were randomly separated into two groups, characterized by receiving two different stimuli, each of them representing one specific motivation leading consumers to acquire green products: one stimulus adopted the social (selfish) perspective, and the other adopted the perspective of the environmental concern (altruistic) (LIN and CHANG, 2012). In this research, the perspective of economic rationality was not analyzed.

Each stimulus offered information on different green applications for smartphones found in the market, and an app represented the motivation considering the social perspective (the app "Green Apes"). Another app used, referring to the perspective of environmental concern, was the app "GoodGuide," which satisfied the characteristics described in the research scenario informed to that group of participants. The descriptions of the apps are shown in Box 1.

After evaluating the research developed by Arruda Filho, Cardoso and Barboza (2017), we decided to withdraw the app GoodGuide from the research, because it could generate a loss of value to the altruistic context, due to its lack of stimulating context for the user. As much as the altruistic environment comes with utilitarian features related to the green context, the value of innovation and being up to date always influences and gets the users attention, which could further jeopardize our observation of the altruistic element. Therefore, the app GreenApes was the only one used, but introduced to the groups with two different descriptions regarding the app's intrinsic attributes, as seen in Box 1.

Box 1

Description of the applications used in the research

Application	Description
<i>GreenApes</i>	<i>GreenApes</i> is the new social network for a sustainable and rewarding lifestyle. As you share your "green" actions in real life (riding your bike, a delicious organic meal, your tips on creative recycling), you get 'Nuts' rewarding your positive impact for the environment and 'BankoNuts' to inspire other users.
<i>GoodGuide*</i> (<i>Green Apes</i>)	Use the app <i>GoodGuide</i> to quickly find safe, healthy, and socially and environmentally responsible products, certified after scientific evaluation.

*Used in the experiment by Arruda Filho, Cardoso and Barboza (2017). For this experiment, it was substituted by the app GreenApes maintaining the same description.

Source: Elaborated by the authors.

Thus, from the 2x2 experiment produced, the first variable of the experiment design, called the "green characteristic," discussed the two different stimuli. The two groups were requested to respond to the questionnaire, considering each one the context received. One group was introduced to the app GreenApes with a more 'altruistic' description, whereas the other received the app GreenApes with the more 'selfish' description.

Then, the variable environmental awareness was observed, separating the respondents into two other groups according to the analysis of their responses based on the consciousness scale presented by Schlegelmilch, Bohlen and Diamantopoulos (1996).

The variable environmental awareness cannot be simulated, which means that only two groups of questionnaires instead of four were distributed, and the other two groups of the 2x2 analysis were removed from the manipulation of the consciousness scale. After the collection of all questionnaires, they were divided into one group of those who described their experience as ones of high consciousness, and another of those who described their experience as low consciousness. Participants who had as a result of the variable the value less than 4 (the scale used 1 to 7) were included in the group of low level of environmental awareness, and those that had a result greater or equal to 4 were included in the group of high level of environmental awareness.

At first, a pilot test was performed and from the analysis of the results, it was possible to observe the need to make changes in the way the questions were formulated and in the characteristics of the stimulus proposed. After this first step, the data was collected and the analysis conducted.

In addition to the intention to use, we also measured the variables 'hedonic value,' 'utilitarian value,' 'social value,' 'perception of green characteristics,' 'prediction of use,' 'current use,' and 'level of environmental awareness' using a Likert 7-point scale. It is important to highlight that the study used two elements of research, distinct because of the different characteristics in the scenarios they propose. However, four research scenarios analyzed were developed from the manipulation of the participants' intrinsic values regarding the environmental awareness found in each scenario.

The variables (Box 2) were adapted from the scales, cited according to each literature presented, with some changes to adjust to the questions (such as the local language and culture), as observed below. The reliability of the constructs presented was measured through the analysis of Cronbach's alpha. The need to remove items from the analysis was also verified.

Box 2

Building the variables

Hypotheses	Name of the variable	Questions	Adapted from
H1 and H2	Intention of use	1. How much would you like to have this app? 6. How interesting would it be to have this app?	Okada (2005); Ajzen (1991)
H3	Hedonic value	2. How fun would it be to use this app? 7. How nice would it be to use this app? 11. How happy would you feel using this app?	Okada (2005)
H3	Utilitarian value	3. How necessary would this app be for your learning? 8. How useful would this app be for you? 12. How important would this app be to help in your rational and responsible decision making?	Okada (2005)
H1	Social value (Normative) *	4. How much would this app influence in building your personal image? 9. How much would you like to show to people that you use this app? 13. How much would you like to be seen using this app?	Ajzen (1991)
H1	Social value (Status) **	4. Most people that know me well think I should use this app. 9. It would be good to be seen using a product such as this one in my daily life. 13. I would like to have this product as a differential from what other people have.	Arruda Filho (2012)
H2	Perception of green characteristics	5. How sustainable are the characteristics of this app in comparison to similar ones? 10. How much does this app stimulates you to know and utilize green products? 14. How recyclable are the characteristics that this product presents to the market? 15. In terms of saving energy, in your opinion, how much is this app likely to influence you?	Lin and Chang (2012); Li et al. (2010)
H4	Prediction of use	17. How interesting would it be to utilize each of the attributes described below for a sustainable app? For each possible function of the app listed, indicate the level of your individual interest.	Harris and Blair (2006); Nunes (2000)
H4	Current practices	21. Which of the attitudes listed below do you practice in your daily life? For each of the attitudes, indicate how often you practice it currently.	Harris and Blair (2006); Nunes (2000)

Continue

Hypotheses	Name of the variable	Questions	Adapted from
H1 and H2	Environmental awareness	22. I choose environmentally friendly alternatives without looking at the price. 23. I give preference for environmentally friendly products if they are at the same price level as the other products. 24. I search for information about the environmental impact of products before purchasing them. 25. I try to purchase products originated from recyclable material. 26. I try to purchase products that reduce water and electricity consumption.	Schlegelmilch et al. (1996); Mohr et al. (1998); Chitra (2007); Kozinets (2008); Lin and Chang (2012)

* Scale of social value used in the previous experiment by Arruda Filho, Cardoso and Barboza (2017);

** Scale of social value used in this study;

Source: Research data. Elaborated by the authors (2015).

Statistical analysis was performed using the between groups ANOVA tables, group statistical analysis and the T-test with independent samples. The construct “green characteristic” was utilized as a factor, in which the number (1) represented the group that received the stimulus referring to the social perspective and the number (2) the group that received the stimulus from the perspective of the environmental concern. In addition, the variance between groups was analyzed graphically and statistically.

Finally, a linear regression was elaborated, aiming to demonstrate the strength of the relationship in which each construct influenced the intention to use green products. The reliability of the data obtained was tested using several statistical analyzes, such as t-test, f test, collinearity statistics, normality test, collinearity diagnosis, residual statistic and scatterplot plot of the residues and predicted values, as well as an assessment of the manipulation for the proposed research design.

EXPERIMENT

This article replicates and expands the study by Arruda Filho, Cardoso and Barboza (2017), which presented stimulus based on the diversity of social characteristics that were validated by the environment rather than by the individual. The experiment presented in this study, however, was elaborated from a new manipulation of the stimuli (privileging the validation by the individual), in addition to a new concept of social value, presented with a specific scale for the “selfish” construction presented.

In this experiment, the new construct used to evaluate the variable ‘social value’ was based on the status and fashion that generates social value in the situation of being different and part of something special. In the experiment of Arruda Filho, Cardoso and Barboza (2017), the variable ‘social value’ was evaluated from a normative perspective, which measured the intensity in which social norms influence the behavior of the individual. It is important to observe that, in their study, the normative social value proved to be irrelevant to influence the consumer’s intention to use. For this reason, we changed the variable to the social value with the context of the individuality of the consumer.

In addition to these changes, the territoriality of the population surveyed was modified to eliminate perception changes due to cultural values, considering that different previous experiences may expand the environmental awareness for groups from more developed cities. Thus, for the experiment of this research, questionnaires were sent only to the students of a specific region of Brazil, performing in that phase an evaluation of the locality, and offering the opportunity for future comparative studies when observing groups in other regions.

The variable “green characteristic” was created from the separation of the participants into two groups. The separation was carried out by applying two stimuli that represented the motivations, leading consumers to acquire green products: the social

perspective (fashion) and perspective of environmental concern (LIN and CHANG, 2012). Each stimulus contained information about different green applications for smartphones. The stimulus of the app GreenApes1 represented the motivation of the social perspective (Figure 2), and the app GreenApes2 represented the perspective of environmental concern (Figure 3), which also changed its description, colors and images in relation to the initial experiment.

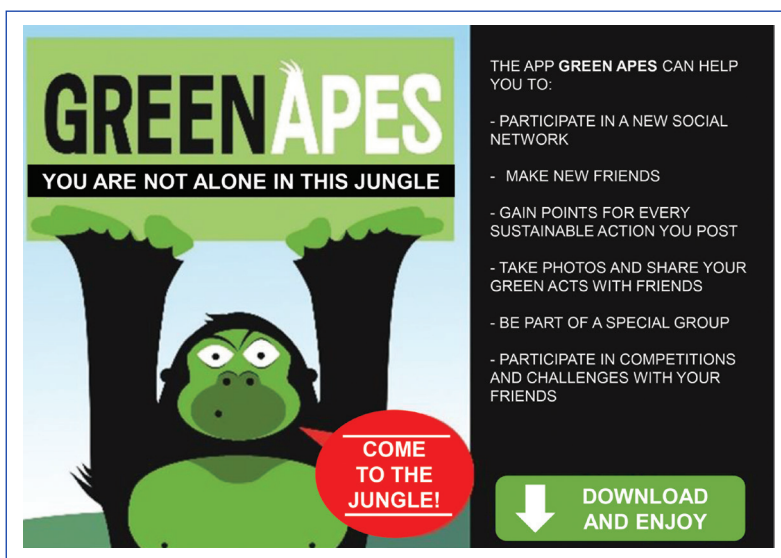
Then the respondents were internally divided into two other groups (the mean of the environmental awareness responses was measured according to the scale, and the groups were separated): one with high and the other with low level of environmental awareness, forming the other variable of the study "level of environmental awareness", according to the measurement of the construct inserted in the questionnaire.

In this experiment, a pilot test was performed with 22 participants. After adjustments, the survey obtained a total of 158 final participants, of whom four were excluded due to incomplete data. The distribution of the number of respondents among the scenarios proposed by the experiment design (figures 2 and 3) was 33 respondents for group 1, 45 respondents for group 2, 30 respondents for group 3 and, finally, 46 respondents for group 4.

As shown in Table 1, the elaboration of the scales based on the research instrument presented a good internal consistency, since the Cronbach alpha analysis for all the constructs varied between 0.815 and 0.936, therefore, within the range of 0.70 to 0.95 recommended in the literature (NUNNALLY, 1978; MURPHY and DAVIDSHOFER, 1988; MAROCO and GARCIA-MARQUES, 2006) and indicating an internal consistency between moderate to high. Thus, the constructs showed statistical reliability, and it was not necessary to exclude items from the analysis.

Figure 2

Stimulus (1), social characteristics of selfishness



Source: Elaborated by the authors.

Figure 3

Stimulus (2), environmental and altruistic characteristics



Source: Elaborated by the authors.

Table 2 was based on the analysis of the ANOVA analysis between groups, statistical analysis of the groups and the t-test with independent samples. The variable "green characteristic" was used as a factor, in which the number 1 represented the group that received the app GreenApes1 as stimulus and the number 2 represented the group that received the app GreenApes2 as a stimulus. The data showed that the variables, 'social value' (status) and 'perception of green characteristics' were significantly different ($p < 0.05$) in comparison to the different convergent stimuli created.

The experiment design proposed that the variable 'social value' would be higher for the group that received stimulus (1). The results, however, diverged from the expected values, given that the variable mean for group 1 was 4.0726; while for the group that received stimulus (2) the mean was 4.6667 ($p = 0.000$).

On the other hand, the variable 'perception of green characteristics' showed the behavior expected according to the design of the proposed experiment: the variable reached higher values for the group that received stimulus (2). This variable means for the group that received stimulus (1) was 5.0256, while for the group 2 the result reached was 5.7862 ($p = 0.000$), i.e., the difference between the means was not expressive.

An analysis of variance was developed in order to use it as a dependent variable. Figure 4 presents the behavior of the consumers analyzed. The variance was significant for the independent variables, with $p = 0.002$ for the variable 'environmental characteristics' and $p = 0.002$ for the variable 'level of environmental awareness'. The interaction between these independent variables did not present a significant difference, demonstrating that the change in 'intention to use' occurs only at different levels of the same independent variable, but not between the two variables simultaneously, which did not support what was described in theories presented above (KUMAR, MANRAI and MANRAI, 2017; LEONIDOU and SKARMEAS, 2017).

Line 1 (Figure 4) represents the group that received stimulus (1) with social and selfish characteristics, while line 2 represents the group that received the environmental and altruistic stimulus according to the level of environmental awareness. Stimulus (1) represents a low level of environmental awareness and stimulus (2) represents participants with a high level of environmental awareness proposed in the design of the research because of the presented stimuli.

Table 1

Statistical reliability of the scales

Variable name	Abbreviation	Cronbach's alpha	Numer of items
Intention of use	M_INT	0.846	2
Hedonic value	M_HED	0.882	3
Utilitarian value	M_UTI	0.874	3
Social value (<i>status</i>)	M_VSE	0.815	3
Perception of green characteristics	M_PV	0.857	4
Prediction of use	M_PRED	0.889	6
Current use	M_USA	0.936	6
Environmental Awareness	M_CONS	0.823	5

Source: Elaborated by the authors.

The analysis of the chart in Figure 4 ratified the initial experiment, demonstrating that the intention to use the green applications was more significant for the participants who received the environmental and altruistic stimulus, independently at the level of environmental awareness (YANG, HSEE and URMINSKY, 2013). Also, it was possible to observe that the intention to use was strongly influenced in a directly proportional way with the level of environmental awareness (MEDEIROS and RIBEIRO, 2017; LIN and CHANG, 2012).

Table 2

Validation of stimuli (manipulation check)

Factor: Stimulus		N	Mean	Standard Deviation	Sig
Social value (<i>status</i>)	1	78	4,0726	1,66333	0,021
	2	76	4,6667	1,49963	
Perception of green characteristics	1	78	5,0256	1,43110	0,000
	2	76	5,7862	1,17877	

Source: Elaborated by the authors.

Therefore, the hypothesis H1 was refuted, considering that even for the group with low level of environmental awareness the preference was given to the application with environmental characteristics instead of the application with social characteristics.

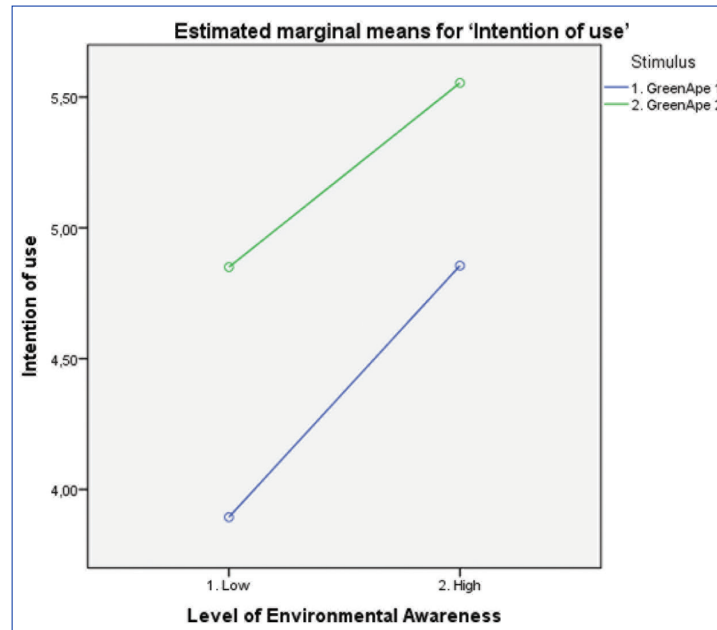
However, the manipulation of the variable social value contributed to the refutation of hypothesis H1, since the analysis was impaired, although the variable was statistically different between the groups, it was more significant for the group that received as stimulus the application with environmental characteristics, contrary to the proposed design (JÄGEL, KEELING, REPPEL et al., 2012).

The influence of social value in the intention of use was considered irrelevant, reinforcing the refutation of H1. For the tech elite, the normative social value, the social value based on status/fashion, did not show influence in consumption practices (SCHLEGELMILCH, BOHLEN and DIAMANTOPOULOS, 1996).

On the other hand, hypothesis H2 was confirmed. The intention of use for the application with environmental characteristics was higher for the group that demonstrated a higher level of environmental awareness.

Figure 4

Analysis of the variance with the 'intention of use' as a dependent variable

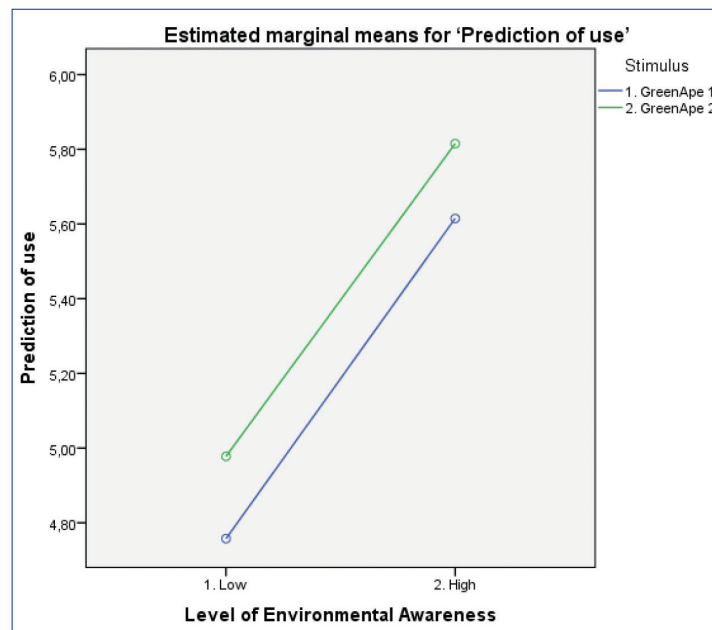


Source: Elaborated by the authors.

The level of environmental awareness showed a strong influence on both the 'prediction of use' (Figure 5) and 'current use' (Figure 6) since these variables were strongly modified from the change in the levels of environmental awareness (low and high).

Figure 5

Analysis of the variance with the 'prediction of use' as a dependent variable

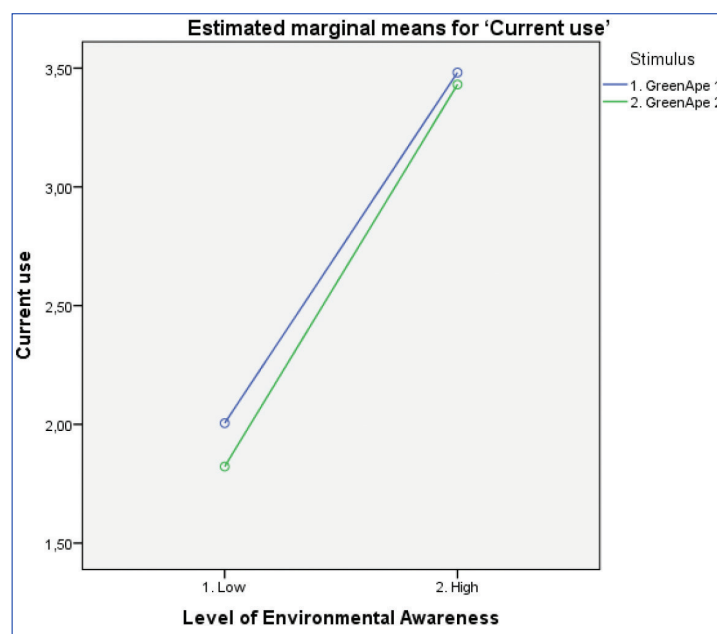


Source: Elaborated by the authors.

The levels of environmental awareness had a significant p -value for both cases (prediction of use and current use), reaching $p=0.000$. There was also a significant increase in these two variables as the level of environmental awareness increased, which contributed to the ratification of hypothesis H2 reinforcing the role that the level of environmental awareness plays to influence the practice of green consumption and to ratify the results found in the initial experiment (KIECKHÄFER, WACHTER and SPENGLER, 2017).

Figure 6

Analysis of the variance with the 'current use' as dependent variable



Source: Elaborated by the authors.

Then, a linear regression of the dependent variable "intention to use" was performed as a function of the independent variables hedonic value, utilitarian value, social value (status) and perception of green characteristics. The result of adjusted R^2 was 0.821, which means that the model created represents, at a level of 82.10%, the variations of the explained variable. Analysis of the ANOVA table showed $f=176.25$ and $p=0.000$, which shows that the model is highly significant.

The data observed was according to the collinearity assumptions, since all the independent variables reached VIF values between 2.80 and 4.70. Therefore, the independent variables do not present an equivalent influence, i.e., collinear, in relation to the dependent variable. Therefore, the independent variables measure different phenomena and there is no multicollinearity in the data.

The analysis of the significance of beta values showed that the variables 'hedonic value' ($p=0.000$), 'utilitarian value' ($p=0.000$) and 'perception of green characteristics' ($p=0.020$) were significant. The variable 'social value' ($p=0.444$), however, was not statistically significant. The regression result with the standardized coefficients was expressed in Table 3.

The model described demonstrated that three independent variables directly influence the variable explained 'intention of use,' although at different intensities. Therefore, the higher the values for the variables 'hedonic value,' 'utilitarian value,' and 'perception of green characteristics,' the greater will be the 'intention to use' the products studied (OKADA, 2005; KATZ and SUGIYAMA, 2006; LEE, LEE and GARRET, 2013).

According to the data collected, the proposed model showed that the variable with the most significant influence on the intention to use green products was the utilitarian value, followed by the hedonic value, and the perception of green characteristics. The data contradicted hypothesis H3, which predicted a more significant influence on the hedonic value of selfish intention when compared to the utilitarian value, although the statistical difference was not very significant (LEONIDOU and SKARMEAS, 2017).

The data also showed that the variable 'prediction of use' was substantially higher than the variable 'current use' (Figure 7), reaching a mean of 5.37 ($p=0.000$) for each sample and ranging from 5.14 to 5.59; while the approximate mean value of the variable 'current use' was only 2.83 ($p=0.000$), ranging from 2.55 to 3.10. Therefore, there was no intersection between these variables and the data reinforced the confirmation of hypothesis H4, which states that the prediction of use of green products is higher than the current use of them, revealing a substantial gap between the intention of green consumption and their actual practice and ratifying the findings of the initial experiment (IYER and RECZEK, 2017; HOCH, 2002).

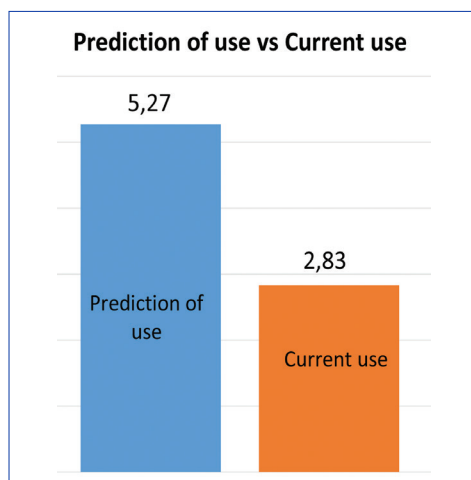
Table 3
Regression of the experiment

Model of intention of use as VD. R ² =0.821. P=0.000			
Variable	Abbreviation	Standardized Coeff.	Sig.
Hedonic value	M_HED	0.377	0.000
Utilitarian value	M_UTI	0.407	0.000
Social value (status)	M_VSE	0.056	0.444
Perception of green characteristics	M_PV	0.136	0.020

Source: Elaborated by the authors.

Figure 7

Analysis of the means of the variables 'prediction of use' and 'current use' for the experiment



Source: Elaborated by the authors.

Consumers have access to the green characteristics, but they do not use it as much. In the process of buying or using a new device, the consumers justify the need to have, by predicting that they will use more of the green characteristics, even though they do not currently use them often.

CONCLUSION

This article presents an experimental study and develops a quantitative research with the aim of explaining green consumption as a result of selfish or altruistic characteristics, and of different levels of environmental awareness influencing the intention to use and current use of green technological products.

Hypothesis H1 assumed that there would be an interaction in the charts showing the analysis of the variance analysis with the 'intention to use' as a dependent variable, and the factor would be the variable 'green characteristic'. It was expected that the intention of use for the application with social characteristics would be greater for consumers who had low level of environmental awareness, since the hedonic and social value would motivate them that the social network exposed in the design of the experiment would offer to users (MEDEIROS and RIBEIRO, 2017, LIN and CHANG, 2012).

However, the data obtained in this experiment led to refute hypothesis H1, considering that the intention of use of the app with social characteristics was higher for consumers with a high level of environmental awareness than those with a low level. Moreover, even for consumers with low environmental awareness, the preference of the participants was for the app with environmentally responsible characteristics, that stimulated altruistic behavior (JÄGEL, KEELING, REPPEL, et al., 2012).

The causes of this behavior were not explored in this research, but it is possible to suggest some explanations to inspire further research. One possibility is that for the green products analyzed, the consumer's preference was not based on hedonic alternatives, as indicated in the research by Okada (2005), but the target public in this research was guided by utilitarian characteristics. This was observed for both groups, the one with a high level and the one with a low level of environmental awareness (GILL, 2008).

Another possible explanation for the rejection of hypothesis H1 lies in the fact that the pleasure associated with social status, provided by the feeling of differentiation and exclusivity (ARRUDA FILHO, CABUSAS and DHOLAKIA, 2008) is different from the hedonic pleasure related to having fun in using the product (OKADA, 2005). Therefore, the hedonic alternatives are overshadowed by the utilitarian alternatives when it comes to consumer's preferences.

The consumption of green products may not be predominantly influenced by selfish motivations in comparison to altruistic motivations as advocated by some authors in the academy (JOSHI and RAHMAN, 2015; MAGNUSSON, ARVOLA, HURSTI, et al., 2001; 2003; MECACHERN and MCCLEAN, 2002). In this context, research data demonstrated that the consumer favors the app that stimulates altruistic behavior rather than the one encouraging selfish behavior.

Therefore, the results showed that, for the tech elite, social value influences green consumption, neither from the normative perspective nor from the perspective of social status. The participants showed a preference for the responsible, solidary, and conscious consumption, to the detriment of a simply hedonic and selfish consumption, which was expected by the theoretical hypothesis.

On the other hand, hypothesis H2 was confirmed and revealed that, for the tech elite, the intention of use for green products with environmental characteristics is greater when the consumer has a high level of environmental awareness (LIN and CHANG, 2012; KUMAR, MANRAI and MANRAI, 2017). That is, as the level of environmental awareness increases, there is a positive impact in the intention of use for these products (SCHLEGELMILCH, BOHLEN and DIAMANTOPOULOS, 1996; PUROHIT, 2012), therefore showing a directly proportional relationship. It is emphasized that this research considered that consumer purchasing behavior is strongly influenced by the intention of use.

The studied consumers have demonstrated putting the discourse about awareness into practice, contrary to what was observed by authors who defend that the relation between the level of environmental awareness and its influence in the behavior of the consumer is weak or even non-existent (WEIGEL, 1983; HINES, HUNGERFORD and TOMERA, 1986; SPADA, 1990; SIX, 1992; SCHAN, 1993; ECKES and SIX, 1994; BAMBERG, 2003; MORAES, CARRIGAN and SZMIGIN, 2012).

However, taking the discourse of awareness into practice is a topic that needs to be better explored, especially about this influence when the consumer faces trade-offs. In addition, this research only evaluated the intention of use from the consumer's point of view. In the decision-making process, the intention is not always transformed into de facto behavior, which is a dilemma that has not been dealt with in this research and is suggested to be addressed in future studies (KIECKHÄFER, WESTERTER and SPENGLER, 2017).

As for hypothesis H3, it was rejected because the young people who participated in the research demonstrated more significant interest in the utilitarian value of altruistic intention, contrary to the hypothesis that assumed a greater interest in the hedonic value of egoistic intention (JOSHI and RAHMAN, 2015).

The findings of this study confirmed hypothesis H4, because the participants predicted a much larger green consumption than is perceived in the current use, as defended by Nunes (2000) and Arruda Filho and Brito (2017). The level of environmental awareness also showed to moderate the prediction of use and the current use, since these variables were positively impacted by an increase in the level of environmental awareness.

The greater difference between the predicted green consumption and the current use informed by the participants indicated a substantial gap between the intention of green consumption and its actual practice, which is an interesting topic for future research. In addition to the limitations described in the review of the analyzes, it is important to emphasize that this research reached respondents from one specific city, only one geographic region. Future research may seek to compare between different groups possible changes in the culture, perceptions, previous experiences with sustainable products and the social maturity of participants.

Finally, this study has implications for researchers and marketing professionals concerning consumer's preference for green products. Regarding the different motivations toward green consumption, consumers showed preferences for products identified with the perspective of environmental concern when compared to the social perspective. In addition, the level of environmental awareness has been an important moderator in consumer's behavior, since people with a high level of environmental awareness show greater intention, prediction and current use of green technological products.

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