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CONCERNING OR ACTING? THE DICHOTOMY BETWEEN DISCOURSE AND PRACTICE IN SUSTAINABLE CONSUMER BEHAVIOR OF PORTO ALEGRE'S CITIZEN

PREOCUPAR-SE OU AGIR? A DICOTOMIA ENTRE O DISCURSO E A PRÁTICA NO COMPORTAMENTO SUSTENTÁVEL DO CONSUMIDOR DA CIDADE DE PORTO ALEGRE

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ABSTRACT

The purpose of this paper is to identify the relationship between attitudes and environmental behavior among residents in the city of Porto Alegre in southern Brazil, using a Survey that was applied with 1200 citizens. We analyzed the descriptive statistics and conducted an ANOVA to test the effects of demographic factors in a series of variables. The gap between "attitude" and "behavior" was confirmed. The willingness to pay a premium for products with environmental appeal, although present in all levels, is higher for people from higher income and educational backgrounds and is higher for cosmetics than for natural foods. Respondents consider environmental criteria at purchase and they know how to dispose of products. Consumers lack of a systemic view of the production and consumption chain. Although our findings have practical (to improve concern in the population) and academic (to compare with similar studies) implications, results cannot be generalized, because they are specifically related to a single city. The results will be valuable in guiding business strategies, public policy and further research. Consumers realize the importance of sustainable issues but they need further knowledge to put their awareness into practice. This paper jointly analyzes awareness, behavior, the importance of the environmental appeal of products and environmental problems. People tend to answer positively, but they fail to act accordingly.

KeyWords: Sustainable behavior. Environmental awareness. Citizens'atitudes**.**

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RESUMO

O objetivo deste artigo foi analisar a relação entre a atitude e o comportamento socioambiental dos cidadãos na cidade de Porto Alegre, no sul do Brasil, por meio de uma *survey* aplicada com 1200 cidadãos. Foram feitas análises descritivas e testes ANOVA para verificar a influência de variáveis demográficas com relação a uma série de variáveis. Comprovou-se o *gap* existente entre a "atitude" e o "comportamento". Em relação à disposição em pagar prêmios por produtos com apelo ambiental, todos os níveis estudados demonstraram interesse, com destaque aos grupos de faixa de renda e estudo mais altos e os cosméticos receberam valores maiores do que os alimentos naturais. Destaca-se a importância do conhecimento para a transformação do comportamento atual em comportamento sustentável. Os entrevistados consideram critérios ambientais na hora da compra e sabem como descartar os produtos, mas não possuem uma visão sistêmica sobre a cadeia de produção e consumo. Embora o estudo apresente implicações práticas e teóricas, os resultados não podem ser generalizados, por serem relativos a uma única cidade. Os resultados são de grande valor para orientar as estratégias das empresas, políticas públicas e novas pesquisas sobre esta temática. Identificou-se que o consumidor percebe como importante e está sensível, mas ainda não coloca em prática tudo o que sabe em relação às questões socioambientais.

Palavras-chave: Comportamento sustentável. Consciência ambiental. Atitudes dos cidadãos.

1. Introduction

We live in an era of unprecedented growth and change, but with this growth, some challenges have come up. One of these challenges is to tackle the environmental burdens caused, among others, by conspicuous consumption lifestyles, and that is becoming increasingly noticeable at the turn of the 21st century (SCHULTZ, 2002). Nevertheless, environmental awareness is growing in several parts of the world, not only in developed countries, but also in emerging nations like Brazil (SCHULTZ, 2002).

The need for change in behavior and consumption patterns was confirmed in Article 224 of the document "The Future We Want" in which it was stated that "[...] We recognize that fundamental changes in the way societies consume and produce are indispensable for achieving global sustainable development" (UN, 2012). Similarly, Sachs (2012) emphasizes that the world must reconcile human activities with environmental constraints and that technological and social change will remain challenges for developed and developing countries.

Typically, environmental concerns are focused on the consequences rather than the causes of environmental problems. The most obvious topics are global warming, deforestation, the appropriate destinations for waste, water contamination and air pollution. The environmental effects of consumption have been discussed based on minimal evidence. Environmental awareness is usually associated with actions such as the sorting of waste into organic and dry waste (paper, glass, plastics, metals, etc.) or water and energy saving MIAFODZYEVA; BRANDT; OLSSON, 2010). Both in developed and in developing countries, the term "ecologically correct" is commonly used. Residents express proper perceptions of environmental problems, but there are few studies on the relationship between such perceptions and environmental behavior in developing countries. The question remains: "*How much of what an individual perceives as important is put into practice?*"

To identify the relationship between the attitudes and environmental behavior of citizens, a study was conducted with 1,200 residents of the city of Porto Alegre in southern Brazil. The city of Porto Alegre has around 1.4 million inhabitants and yet is one of the greenest cities in the world, with over 1.5 million trees, biological reserves, nine city parks and a large concentration of birds (IBGE, 2013). Although it is an urban pioneer with regard to environmental issues in Brazil and is commonly considered a green city, there is a gap between its residents' perceptions regarding environmental problems and their behavior

(NASCIMENTO *et al.*, 2011). Despite the importance of the environment, little is known about people's values and perceptions regarding their environmental responsibility (SHEPHERD; KUSKOVA; PATZELT, 2009). So, this paper aims to close this gap.

The paper is divided into six parts. In addition to this introduction, two sections present a literature review, which aims to theoretically establish the association between consumer behavior and environmental effects as well as to explore the attitudes of individuals regarding environmental issues. The fourth section presents the method used in this study. The fifth section reports the results and presents the reliability analysis of the questionnaire using Cronbach's alpha, followed by an analysis of the descriptive data for the population studied and the ANOVA. Then, the final considerations are discussed.

2. Consumer Behavior and Environmental Effects

The activity of consumption guides social relationships and contributes to economic dynamics. Consumer behavior is the social and psychological process that people experience in the acquisition, use and disposal of products, services, ideas and practices (BAGOZZI; GURNAO-CANLI; PRIESTER, 2002). However, the current pattern of contemporary consumption in society is leading to unnecessary, ostentatious, and excessive consumption and thus is critically threatening environmental sustainability (VIEGAS DA COSTA; TEODÓSIO, 2011).

Environmental problems are caused by human behavior, and solutions become possible through changes in behavior (SCHULTZ, 2002). The literature has indicated that consumers today seem to be more concerned with moral values and in supporting companies with this same orientation; hence, consumers are also more willing to buy products with ethical appeal (FERRAN; GRUNERT, 2007). Research on sustainable development has indicated the relevance of values, beliefs and norms to consumer attitudes and behaviors as they relate to the environment (JANSSON; MARELL; NORDLUND, 2010; KIM; CHUNG, 2011; PERREA, T. *et al.*, 2014; SHEPHERD; KUSKOVA; PATZELT, 2009).

Values are central elements of the self (WADE-BENZONI et al., 2002), and correspond to intentions that address the concerns of individuals or groups (SCHWARTZ, 1992). Beliefs in this context involve awareness of environmental consequences and the allocation of personal responsibility for adopting preventive measures. Finally, norms relate

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to the feeling of moral obligation that leads to attitudes committed to nature (JANSSON; MARELL; NORDLUND, 2010).

Overcoming old habits and choosing new, more sustainable ways of acting is a great challenge. A habit is a specific behavior used to reach a goal that requires minimal attention and preparation on the part of the person (i.e., something automatic). Although norms, beliefs and personal values have a significant positive influence on willingness to carry out a certain behavior, the force of habit may prevent an appropriate behavior (JANSSON; MARELL; NORDLUND, 2010).

In this sense, there is another element that brings difficulty to define the factors that may influence a more sustainable behavior. For example, people can choose to neglect some situations that can cause discomfort, challenges and changes (WADE-BENZONI *et al*., 2002). Kollmuss and Agyeman (2002) note that several theoretical frameworks have been developed in an attempt to explain the gap between the possession of knowledge and actual environmental awareness (defined as sustainable behavior), but any definitive explanation has been found. Sustainable behavior is when one consciously seeks to minimize the negative impact of actions (e.g., to minimize the consumption of energy and resources, to use non-toxic substances or to reduce the amount of waste that one generates). According to these authors, questions such as "Why do people act environmentally and what are the barriers to sustainable behavior?" are extremely complex.

In the case of Brazil, particularly, it has been noticed significant advancements in several areas (OECD, 2014), and since 2006, an economic growth led to a rising demand, wherein households are now experiencing consumption possibilities that go beyond the satisfaction of basic needs (ARNOLD; JALLES, 2014). Although this is a good thing for Brazilian population, this raise in consumption increases resource consumption, what can have some consequences for the environment. In addition, there is a gap between attitudes and actual behavior, mainly for environmental issues (DE BARCELLOS *et al.*, 2011), and also particularly for the case of consumers from the city of Porto Alegre (BOSSLE *et al*., 2015; DE BARCELLOS *et al.*, 2015).

Consumers' assessments of products and companies are based on their own preferences and their own cognitive maps (BANSAL; CLELLAND, 2004) that are drawn according to their core values (WADE-BENZONI *et al.*, 2002). Therefore, the citizens' buying behavior is one of the concepts studied in this paper. Individuals' attitudes are

discussed in the next section, which considers the cognitive and emotional involvement and the actions of citizens who face quite a few scenarios. This information can be used to generate suggestions to minimize the effects of negligent consumption.

Solomon (1999) and Peter and Olson (1999) presented a basic model of consumer buying decision-making that involves various steps: acknowledgment of the problem, information searching, the evaluation of alternatives, purchasing, and post-purchase behavior. According to Peter and Olson (1999), this decision-making process involves **purchasing options** (what, when, and where to buy and how to pay), **consumption options** (whether or not to consume, when and how to consume) and **disposal options**. Engel, Blackwell and Miniard (2000) add to this traditional model by including the steps of consumption and disposal as the final steps in the consumer decision process. These steps were used to help construct the data collection instrument for this study.

The concept of responsible consumption, in which consumers' purchasing decisions have clearly been influenced by increased environmental awareness and sensitivity is related to the latter two steps of the purchase decision-making process mentioned above (DRUMWRIGHT, 1994; MENON; MENON, 1997). People can be considered ecologically committed when they understand specific local environmental problems and consider the effects of improper actions (WHITEMAN; COOPER, 2011).

The establishment of sustainable patterns of consumption can be promoted by cultural and circumstantial influences, and indeed, these influences are essential conditions for changing values and individual behavior (ZABEL, 2005). As conscious options, it should be included the reassessment of the amount of products purchased, fostering socially responsible brands, reducing waste and promoting reuse or recycling behavior. Changes in people's attitudes regarding these issues are all conceivable.

Based on this notion, the consumerism movement is attempting to fight against conspicuous consumption. The precise goal of the movement is to develop awareness regarding the negative consequences of alienated consumption (VIEGAS DA COSTA; TEODÓSIO, 2011). The next section of this paper addresses the attitudes of citizens regarding environmental issues. Understanding this factor can influence initiatives that are intended to change consumer attitudes and behavior.

3. Attitude and Socioenvironmental Issues

The word "attitude" tends to express a state of mind regarding an established behavior of individuals, whether a feeling or an opinion. Attitude can also refer to a point of view or way of thinking. Thus, attitude intrinsically has to do with a person's individual position regarding some topic (BAGOZZI; GURNAO-CANLI; PRIESTER, 2002). Still, in an organizational and planning context, it is important to understand what consumers know and do not know in addition to what consumers like and dislike. These preferences and aversions are called attitudes, defined as a general assessment (ENGEL; BLACKWELL; MINIARD, 2000) accomplished by the consumer. Therefore, an attitude is evaluative in its nature and is favorable or unfavorable response to an object, person, institution or event (AJZEN, 1988).

An attitude consists of three components: the cognitive, affective and conative. The first is the person's knowledge and beliefs regarding the object being evaluated. The affective component involves the person's feelings regarding the object. Finally, the conative component is the person's behavioral tendencies as they relate to the object (ENGEL; BLACKWELL; MINIARD, 2000).

In the socioenvironmental context, research suggests the existence of different types of attitudes, indicating that two people can be equally concerned about environmental problems but that their concern may be due to different reasons. In several studies, the more interesting question is not whether the individual is concerned (or not) about environmental problems (considering that most people tend to be) but why and how that person expresses concern (SCHULTZ, 2002).

Each person's environmental concerns reflect his or her underlying values, which, according to Schultz (2002), might include selfish, altruistic or biospheric attitudes. Selfish attitudes involve a focus on the individual, in which the individual expresses concern regarding the impact of environmental problems on himself, including his health, financial well-being, quality of life and availability of resources. In turn, altruistic attitudes involve a focus on other people, including friends, family, community, future generations and humanity. For altruistic individuals, consumption-related decisions are made in relation to others and what they experience. Finally, biospheric attitudes are focused on all human beings, plants, animals, ecosystems and the biosphere (SCHULTZ, 2002) and take into account the costs and benefits associated with these factors and how they might influence one's decisions.

For consumer behavior modeling, understanding these attitudes is an important objective. When selecting what to buy, a consumer usually chooses a brand that he or she evaluates more positively. Thus, understanding a consumer's attitudes may help us to understand why a consumer buys a particular product or shops at certain stores and may help us to identify when his or her attitudes are related to the knowledge that he or she has about these choices (ENGEL; BLACKWELL; MINIARD, 2000).

By broadening the understanding of consumers' attitudes and behaviors in relation to the environment, it will be possible provide knowledge for companies, governments and decision makers to transform production, communication, legislation and consumption patterns. Sustainability must be promoted by providing knowledge to citizens in a way that they will be more willing to take more sustainable decisions, and sensible regarding the collective environmental and social impact of individual consumption patterns.

For example, in examining the consumption of green foods, several studies (GRUNERT, 1993; GRUNERT; JUHL, 1995; HOPPER; MCCARL, 1991; PERREA *et al.*, 2014; SCHWARTZ, 1992) concluded that personal values influence environmental behavior, which in turn affects (usually positively) their perceptions, purchase intentions and behavior in relation to this type of food. Nevertheless, a gap exists between discourse and practice in relation to the behavior of citizens faced with social and environmental issues (BOSSLE; DE BARCELLOS; VIEIRA, 2015).

Kollmuss and Agyeman (2002) analyzed the factors that may exert some influence on pro-environmental behaviors, including demographics factors, external factors (institutional, economic, social and cultural factors) and internal factors (motivation, environmental knowledge, awareness, values, emotion, responsibilities and priorities). The authors argue that environmental knowledge is a subcategory of environmental consciousness and that emotional involvement is what shapes attitude and environmental awareness.

It is difficult to define and delimit these different factors because most of them are broadly and vaguely defined. In addition, the self-centered orientation of the individual can motivate pro-environmental behavior in particular cases in which the behavior also satisfies the needs of the individual (for example, when a person uses the train system rather than driving a car because he or she wants time to relax and read) (KOLLMUSS; AGYEMAN, 2002).

In a consumer study conducted in the city of Porto Alegre (Brazil), the participants, residents who are typically considered to be socioenvironmentally responsible, often reported only making environmentally conscious choices in their homes (NASCIMENTO *et al*., 2011). In other words, the citizens lacked a systemic view and failed to see that their attitudes, which led to inappropriate behavior, could influence the community as a whole.

Jayaraman and Luo (2007) had already warned that many companies are not used to thinking that the resources, products and waste that the use in their operations and exchange with other organizations also have value. It seems that consumers also lack such knowledge. Data related to waste management from the city of Porto Alegre, the municipality in which the study was conducted, indicate that selective collection (recyclable waste – plastic, paper, glass, metals) collected 22,880 tons of municipal waste in 2009, whereas conventional collection (organic waste) collected 502,144 tons of municipal solid waste (SNSA, acronym in Portuguese for National Secretary of Environmental Sanitation, 2011). Hence, we can see that many packages that could be reused through recycling do not return to the production chain. This fact indicates minor concern with the value of waste collected by selective collection.

To promote better behavior with respect to recycling, it would be desirable to understand recycling-related behaviors (MIAFODZYEVA; BRANDT; OLSSON, 2010). The authors conducted a study to identify how pre-recycling at home can help in the final recycling process. The responses demonstrate that not all citizens are willing to separate waste daily. Of those who responded that they did not separate waste, most justified their actions with statements such as "I don't have time to separate, collect and carry my waste," "I don't have much space in my apartment to separate and collect waste," or "I'm afraid of unpleasant odors." The need for extra effort, an additional time investment and more space, as well as the need to transport the garbage out of the residence, all create barriers to pre-recycling (MIAFODZYEVA; BRANDT; OLSSON, 2010, p. 345).

Therefore, instead of overcoming these barriers, citizens often hide themselves behind pro-environmental discourse, claiming to be defenders of the environment. That is, citizens seem to separate being a good consumer from being a good citizen (VIEGAS DA COSTA; TEODÓSIO, 2011). Citizens' lack of knowledge about the values associated with socioenvironmental responsibility, as studied by Shepherd, Kuskova and Patzelt (2009), gives rise to various questions. For example, what attitudes and behaviors are associated with the

values that promote environmental sustainability? How is a citizen's behavior influenced by his or her values? In this context, it is essential to develop a critical point of view that reflects the conflict that exists between individual and collective interests, in which consciousness is divided between the concerns of the individual and those of society.

4. Method

This study was conducted in two phases: the first qualitative and the second descriptive. The first stage was exploratory and was used to gather the input needed to develop the questionnaire applied in the survey presented in this paper. During this phase, in-depth semi-structured interviews were conducted between the months of July and August, 2011 with six residents of the city of Porto Alegre and six environmental experts (NASCIMENTO *et al.*, 2014). The members of the first group were selected based on their age, gender and education to target distinct profiles and examine distinct perceptions about the environment. The experts (who also lived in Porto Alegre) were selected to cover different areas of knowledge (technical and management) in addition to the various professions that are directly related to environmental sustainability. The interviews were recorded and transcribed, and each lasted between 35 and 75 minutes.

The results of these interviews were combined with the literature review and developed into a questionnaire made up of seven sets of questions that guided the descriptive phase (the survey), which is the focus of this article. The first section (A - Questions about the environment) includes nine questions and explores attitudes toward the environment. The second section (B - If I take better care of the environment, I ...) includes eight questions and presents the respondents' expectations regarding the impact of their future individual actions on the environment. The third section (C - Who should promote environmental responsibility in people…) consists of six questions and indicates who should promote environmental responsibility. The next block (D - On my buying behavior ...) includes 13 questions about purchasing behavior, including willingness to pay more for green products. Section E (11 issues) addresses consumer habits, and finally, the last section (F - About disposal and recycling ...) uses 14 questions to investigate the attitudes and behavior of respondents regarding the disposal and recycling of products. We also added three more questions about the respondents' knowledge about waste collection and what can be done to improve their

participation in a better waste management system. The final part of the questionnaire addresses the participants' demographics.

A six-point Likert-type rating scale was used. The scale's endpoints are "Totally Agree" to "Totally Disagree," and the option "I cannot express an opinion" is included. Before the questionnaire was distributed to the subjects, a pilot test was conducted with 12 people to assess the clarity and the participants' comprehension of the measured items.

Data collection was performed in-person in November 2011 in six neighborhoods in the city of Porto Alegre. These areas were chosen due their social-demographic characteristics. The neighborhoods were chosen based on social class to obtain a faithful representation of the population of the city. More specifically, two neighborhoods from each class were selected: low (Restinga and Bom Jesus), medium (Bom Fim and Cidade Baixa) and high (Chácara das Pedras and Três Figueiras) (PMPA, 2013).

Within these neighborhoods, the participants were randomly selected while in their homes or on the street. The final sample included 1197 valid cases from a total of 1200 respondents. The sample characteristics are shown in the next section.

4.1 Demographics

Questionnaires were distributed in the Chácara das Pedras and Três Figueiras (**upper class**) neighborhoods, which provided 34.2% of the sample; the neighborhoods of Bom Fim and Cidade Baixa (**middle class** or intermediate), which provided 32.3% of the respondents; and the neighborhoods of Restinga and Bom Jesus (**lower class**), which provided 33.5% of the respondents.

Regarding the age of the respondents, it is noteworthy that 56.6% of the sample was 40 years old or younger. The largest group was between 31 to 40 years; this group represented 27% of the total. Female represented 60.5% of the sample and males, 39.5%. In Porto Alegre, there are 1,409,351 inhabitants: 54% female, 46% male and 59% under 39 years of age (IBGE, 2013). The demographic data are shown in Table 1.

Table 1 - Sample population characteristics

Variable	Level	Frequency	Percent
Gender	Male	473	39.5
	Female	724	60.5
Age	< 20	119	9.9
	20 - 30	235	19.6
	31 - 40	**323**	**27.0**
	41 - 50	261	21.8

	51 - 60	161	13.5
	61 - 70	68	5.7
	> 70	30	2.5
Income (per month)*	Less than R$1,400	262	21.9
	R$1,401 - R$2,300	168	14.0
	R$2,301 - R$4,500	167	14.0
	R$4,501 - R$6,000	**237**	**19.8**
	R$6,001 - R$8,000	191	16.0
	> R$8,001	172	14.4
Education	Less than Grade 9	95	7.9
	Grade 9	168	14.0
	Some High School	133	11.1
	Graduated High School	266	22.2
	Some college	232	19.4
	Undergraduate	**303**	**25.3**

*Monthly Income

5. Results

In this section the main results obtained in this study are presented and discussed based on the literature described above. We initially discuss the reliability of the questionnaire based on the Cronbach's alpha and then describe the data and the results of the ANOVA test.

5.1 Cronbach's Alpha

To assess the internal consistency of the data collection instrument, Cronbach's alpha coefficients were measured both for the full questionnaire and individually for each of the question blocks. In almost all cases, satisfactory internal consistency was found. Except for block E (0.57), that is close to the acceptable rate of 0.6, being compensated by the total cronbach's alpha, and justified by the use of an exploratory data collection instrument. All other values were above 0.69, which yielded a total Cronbach's alpha equal to 0.722, a rate accepted by Hair *et al.* (2005) and Malhotra (2012). Table 2 shows the results.

Table 2 - Cronbach's Alpha

Data Collection Instrument (Question block)	*Cronbach's Alpha*	Number of statements
SECTION A - Questions about the environment **(attitudes)**	0.69	9
SECTION B - If I take better care of the environment, I ... **(expectations)**	0.809	8
SECTION C - Who should promote environmental **responsibility** in people…	0.752	6
SECTION D - On my **buying** behavior ...	0.708	13
SECTION E – **Habits**	0.57	11
SECTION F - About **disposal** and **recycling** ...	0.763	14
Total *Cronbach*	**0.722**	**61**

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5.2 Descriptive Statistics

After identifying and analyzing missing values, 1197 observations were used in the analysis. No questionnaire had more than 2.8% missing values. In this section, we analyze the means of the quantitative variables. The lowest average was found for item 37 ("I think it is normal to see someone washing the sidewalk with a hose," with a mean of 2.1); it is worth to noting that this is the only inverse question of the questionnaire. Four questions returned means lower than 3. These scores mean that, on average, more people disagree than agree with the following statements: **"**When I discard soda packaging, I remove its lid and its label to facilitate recycling"; "I usually ride on my bicycle"; "I try to reuse the water from laundry to flush the toilet or wash the sidewalk"; "I always wash PET soda bottles before discarding them".

Overall, the high mean scores (23 out of 61 questions scored higher than 5) were associated with answers that can be interpreted as environmentally appropriate or consistent with social norms. This suggests that the respondents may have provided responses that are social acceptable. The highest average was obtained for the question that states that citizens themselves must seek information and become aware. That is, in this survey, citizens communicated a sense of responsibility for caring for the environment. These results are also consonant with Viegas da Costa and Teodósio (2011), when stated that citizens want to be seen as responsible and tend to hide behind small pro-environmental attitudes, even if it is inconsistent with their actual behavior.

In the second phase, the questionnaire was analyzed by section. The first section (A - Questions about the environment) indicates that attitudes regarding the environment, are positive, with averages above 4.5. The second section (B - If I take better care of the environment, I ...) presents respondents' expectations regarding the impact that individual environmental actions will have on their future. The results are also positive, with averages ranging from 4.84 to 5.84. In this section, the idea of "... give a better future for my children and grandchildren" garnered the highest average (5.84), followed by concern for the future of species threatened with extinction (5.61) and worry about avoiding catastrophes (5.40).

It is understandable that concern about the future of one's children and grandchildren would be most common because this issue has to do with one's direct descendants, reflecting one component of altruism as characterized Schultz (2002). The lower average obtained for the statement "will avoid a major catastrophe" (5.40) relative to the statement about the

extinction of species (5.61) may be a function of the controversy over the potential impact of human actions on global warming. If the respondents were certain that caring for the environment could avoid disasters, given the tendency for selfish behavior cited by Schultz (2002), this statement might have received a more positive response than the statement regarding the preservation of species threatened with extinction because the impact of disasters on the lives of the respondents would be more obvious.

There are no greater differences present in the third section (C - Who should promote environmental responsibility in people...). All the agents were given high scores: among citizens (5.9), in the media (5.80), in the government (5.76), at universities (5.74) and in non-government organizations or NGOs (5.62). It is well known that universities and schools (5.74) influence environmental awareness by including this subject into school and university curricula. However, we should note the important role played by the media, with an average of 5.80, which is higher than the importance given for NGOs (5.62), which mostly aim to promote environmental awareness.

One potential explanation for this finding could be the strong influence of the media on the population. Cultural influences may act as agents of change in consumption patterns and even values, possibly redirecting consumption into a more sustainable pattern (ZABEL, 2005). These data are highly relevant in Brazil, in which 175 million Brazilians out of approximately 190 million regularly watch television (IBGE, 2013). The three highest penetration rates for the media in Brazil are those of broadcast television (97%), radio (78%) and newspapers (60%) (GMSP, 2012). Moreover, Internet use is growing: in May 2012, Brazil had 85 million internet users, and this figure represents an increase of 157% over the corresponding figure from 2006 (ComScore, 2012).

The results presented above could also be the result of increased consumer concern with moral values, as previously reported in the literature (FERRAN; GRUNERT, 2007; SHEPHERD; KUSKOVA; PATZELT, 2009; JANSSON; MARELL; NORDLUND, 2010). However, contrary to what is indicated by those authors, this concern has not yet altered the behavior of consumers with respect to the environment.

The results for section D (On my buying behavior...) indicate this distinction. Although the respondents say that they have good attitudes and expectations and a sense of their own responsibility related to buying, the average scores for their behaviors are lower (approximately 3 or 4 points - Table 3). The lowest average (3.48) was obtained for a question

that asks about the consumer's concern regarding the product life cycle. This finding shows that there is a lack of information or even of interest in obtaining information about this life cycle. For many consumers, the product is "born" in the store and "dies" when discarded. The social and environmental effects that are generated at other stages of the product's life cycle are not considered at the time of purchase (NASCIMENTO *et al.*, 2014).

Table 3 - Buying behavior

D - On my buying behavior ...	Mean	Std. Dev.
To see if a product is green, I usually analyze its entire life cycle.	**3.48**	**1,65**
When I buy a bottle of water or soda, I care about the type of waste it will generate.	3.64	1,75
I check if there are chemical preservatives and try to buy products the more natural as possible.	3.85	1,58
I question myself if the information on the labels is true or not.	4.16	1,54
I worry about environmental issues at the time of purchase.	4.35	1,48
I try not to use anything that is tested on animals.	4.38	1,64
I want to be environmentally correct, but it seems that society does not want me to be, because to do so is very expensive.	4.41	1,58
I prefer natural foods to processed ones.	4.63	1,38
I find it hard to find the information on labels (small fonts, etc.).	4.71	1,42
I think it would be good to return to the use of glass bottles and no longer use PET.	**4.82**	**1,42**

Section E refers to the habits of consumers and presents overall positive results summarized in Table 4. As previously mentioned, the low average (2.49) for the question concerning the use of bicycles may be a function of the lack of safety of cycling in a city with few bike paths or lanes. The poor response to the reuse of water may be related to the difficulty of reusing water in these ways. These lower averages in some questions may be related to the findings of Jansson, Marell and Nordlund (2010), who claim that the force of habit may inhibit the connection between social norms, beliefs and positive attitudes and actual behavior. We might say that the participants still fail to exhibit sustainable behavior (KOLLMUSS; AGYEMAN, 2002).

In this section, we can infer several results concerning the environmental awareness of the respondents. Examples include the two questions concerning efforts to save energy in the home (5.49) and in the workplace or in public places (4.85). Most likely, the different levels of enthusiasm about these two possibilities result from the fact that energy consumption in households is paid for by the household's residents, whereas energy consumption in the workplace is the responsibility of the company for whom the respondent works. That is, reducing energy consumption is only cost effective at home.

Table 4 - Habits

E – About my habits	Mean	Std. Dev.
I think it is normal to see someone washing the sidewalk with a hose.	**2.10**	**1,61**
I usually ride on my bicycle	**2.49**	**1,78**
I try to reuse the water from laundry to flush the toilet or wash the sidewalk.	**2.51**	**1,91**
I try not to use the car a lot. Driving is addictive	4.12	1,81
Whenever possible, I use public transportation.	4.55	1,72
I try to group external activities together so that I can drive less.	4.58	1,45
I try to optimize my use of energy.	4.71	1,35
I try to save energy in my work and in public places.	4.85	1,48
I think it is important to install a cistern to harness rainwater.	5.37	0,89
I try to save energy at home.	5.49	1,02
I think it is important that my building / house have water heated using solar energy.	5.52	0,75

Finally, section F relates to disposal and recycling. In this section, we observe that some of the issues related to recycling behavior remain unknown (Table 5). For example, as noted in the exploratory stage, actions like washing materials before recycling are controversial. Although washing is technically unnecessary for recycling, this is a social issue because the waste is destined for sorting centers where the separation of packaging is performed manually by workers who may become sick if consumers discard containers with food debris that may decompose and attract insects and disease. Such debris may also generate unpleasant odors in the sorting centers.

Perhaps for this reason, the score for those who claim to know how to separate garbage – "I know what can and what cannot be placed in dry waste" (5.08) is higher than the score for those who actually sort waste in their homes – "I do separate waste correctly in my home" (4.89). Although selective collection occurs for 95% of homes in the city of Porto Alegre, this difference shows that not everyone is aware of the program or is willing to separate garbage in their homes.

These findings corroborate the assertion by Miafodzyeva, Brandt and Olsson (2010) that to encourage better behavior with respect to recycling, we must understand these behaviors and the willingness of individuals to participate in this process. Here, although the results did not indicate the best recycling-related behavior, it seems that people are predisposed to change their habits when they have more information and knowledge about the subject. The high scores for the questions "I would be willing to return PET bottles if there were collection points available" (5.12) and "I would like to decrease the amount of garbage produced in my house" (5.13) prove this assertion.

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TABLE 5 - Disposal and Recycling

Disposal and Recycling	Mean	Std. Dev.
When I discard soda packaging, I remove its lid and its label to facilitate recycling.	**2,44**	**1,74**
I always wash PET soda bottles before place them in dry waste.	**2,80**	**1,92**
When I dispose of aluminum cans, I crush them to reduce the volume.	**3,59**	**2,03**
The waste collected by individual waste collectors and by the DMLU travels the same way.	4,20	1,57
I know the destination of the regular garbage collected by the DMLU in my residence.	4,49	1,43
I think it is important to wash containers intended for recycling, removing uneaten food.	4,66	1,63
I properly sort my waste when I am on the street or in collective spaces.	4,80	1,51
I properly sort the waste in my residence.	4,89	1,46
I do not always know where to drop off fluorescent bulbs, broken glass, batteries (e-waste).	5,02	1,18
I know what can and cannot be placed in dry waste.	5,08	1,16
I would return PET bottles if there were collection points available.	5,12	1,22
I would like to lessen the amount of garbage produced in my house.	5,13	1,11

The lack of knowledge about the paths traveled by waste is evident, for example, in the responses to the question regarding the mode of transport and the destination of the waste collected by individual waste collectors and by the DMLU (4.2). In reality, the waste collected by the DMLU goes to registered sorting centers, whereas the waste collected by individual collectors goes to recycling companies or dealers of raw materials. Individual waste collectors are people who walk through the streets and gather waste material that has commercial value (metal, plastic, aluminum, and other such materials), selling it to companies that recycle or resell these materials. They do this work before the DMLU trucks arrive. The trucks deliver the remaining dry waste to the sorting centers.

Additionally, in the questionnaire, the respondents were asked to indicate the days of the week on which selective collection is performed on their street. Almost half of the sample responded that they did not know (48.5%), demonstrating low interest in the subject. The participants may have been ignorant of the schedules because they do not handle the garbage themselves; instead, the maids or janitors for the respondents' buildings may handle the material that is collected.

When asked what would be required to increase their individual attempts at recycling, the respondents most often indicated that they need "greater knowledge about it" (45%), which reinforced the need for a continuous flow of information to the population. In their study, Dal Piaz and Ferreira (2011) found similar results and considered it essential that we develop a "good channel of communication, management assessment, action planning and alignment of information to provide continuous improvement in the management of urban solid waste." Other problems cited by the respondents include the need for extra time for these activities (16.3%), the extra effort required to separate goods for recycling (10.3%), lack

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of financial incentives (11.4%), a lack of storage space in which to store waste (8.4%) and the dearth of specific legislation on this issue (8.4%). In addition, given Jansson, Marell and Nordlund (2010)'s discussion of the work of overcoming old habits and establishing new, more sustainable ways of behaving, it seems that the force of habit may make it even harder to change these behaviors.

Although this study yielded some satisfactory results regarding concern about the environment, a more sustainable behavior still need to be encouraged. Like Afroz and Masud (2011), we believe it is necessary to broaden people's knowledge about how to act both individually and in groups. Nonetheless, there seems to be some environmental awareness in the sample, as we observed a very high average level of perceived responsibility among our participants with respect to the improvement of environmental problems (5.9). However, this awareness seems to be more theoretical or founded in the desire for social acceptability, as the respondents seem to take fewer environmentally aware actions.

5.2.1 ANOVA

In conducting the ANOVA test to show the effect of factors such as income (per month), age, education, gender and relational state, we observed the significant influence of a number of these variables on the groups. However, although there are significant differences among the groups, they are small in magnitude.

In analyzing the effect of income on attitudes (Table 6), we found that only three of the nine questions yielded statistically significant answers ($p < 0.05$). Furthermore, the differences in these averages were small. Respondents with incomes higher than R$8,001 are less concerned about the influence of their actions on the environment **(q1 - I think all attitudes are important in relation to the environment)**. There is a consensus that it is necessary to **integrate socioenvironmental issues into daily life (q4)**, especially among those with incomes between R$1,401 and R$2,300. Among those **who stopped buying from companies that pollute the environment (q8)**, those with incomes between R$2,301 and R$4,500 (average 4.92) responded slightly more favorably. Consumers seem to be more concerned about moral values; they notice when companies support those values, and they are more willing to buy products with ethical appeal (FERRAN; GRUNERT, 2007).

Table 6 - ANOVA Attitudes - Income (only the statistically relevant data)

A - Questions about the environment	(q1)		(q4)		(q8)	
Income	**Mean**	**Sig.**	**Mean**	**Sig.**	**Mean**	**Sig.**
Less than R$1,400	5.49		5.16		4.47	
R$1,401 - R$2,300	**5.65**		**5.22**		4.69	
R$2,301 - R$4,500	5.52		4.94		**4.92**	
R$4,501 - R$6,000	5.42	<0.001	5.13	0.01	4.51	<0.001
R$6,001 - R$8,000	5.47		5.03		4.43	
> R$8,001	**5.25**		**4.88**		**4.04**	
Total	5.47		5.07		4.50	

*Monthly Income

In the second section, with respect to the need to save the species from extinction, the lowest income range (Less than R$1,400) is the most optimistic (5.71). Even though we can observe politically correct answers in this section as well as throughout the entire questionnaire, we can also see some differentiation among the groups in terms of their concern regarding personal image. The highest income group (over R$8,001) has the lowest average belief (4.1) that one can develop a good reputation with one's friends by taking care of the environment. In contrast, the intermediate range (R$2,301 - R$4,500) is the most concerned with such efforts (5.46). This finding indicates that changes in both values and individual behavior can be promoted by external cultural and situational influences (ZABEL, 2005), i.e., by changing social perception.

In section C, regarding responsibility, three of the eight responses showed significant differences across income groups: ... the government through federal, state and municipal channels ($p < 0.001$); … universities and schools ($p = 0.008$); ... in general, people are influenced by society with respect to environmental responsibility ($p < 0.001$). However, these differences were not large in magnitude. In the sample's perceptions regarding government responsibility, we can see differences between groups with differing levels of education: less educated people (Less than Grade 9) assign more responsibility to the government (5.96). The lowest average score is associated with people who attended some college courses (5.68). In this section, none of the answers were significantly different based on gender.

In Section D, which concerns buying behavior, results vary. Concern regarding environmental issues during shopping is evidenced by averages from 4.04 to 4.67 (which increase relative to income), as shown in Table 7. However, the sample exhibited a low level of concern regarding the product life cycle (3.48). That is, at the moment of purchase, it seems that people do not think about later results of their action. Respondents with higher incomes (>R$8,001) are relatively more concerned with the waste that their purchases will

generate (4.41) and the product life cycle (4.24). This may be because while the media often publicizes the environmental problems of electronic waste (e-waste), the disposal of tires and lamps, and other similar issues, the media does not discusses the life cycle of the products. For example, the news focuses more on the effects of the disposal of mobile devices than on when it is necessary to purchase a new appliance or how dropping a device affects its potential lifespan.

In the same way, respondents with high incomes tend to prefer more natural products (4.88) and are more willing to pay a premium for products with natural or ecological appeal. With respect to the question about natural products in relation to education, there are also differences in this willingness to play ($p < 0.001$), with undergraduates scoring this question highest. In addition, women (4.01) provided higher average scores than men (3.6).

TABLE 7 - ANOVA for buying behavior **

D - On my buying behavior ...	I care about environmental issues at the time of purchase (q24).	I care about the type of waste a purchase will generate (q25).	To consider a product ecological, I look at the whole life cycle.	I try to buy products that are as natural as possible (q27).	I try not to use anything that is tested on animals (q28).	I always mistrust the information on product labels (q29).	I prefer natural foods to processed ones (q32).
Income*	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
Less than R$1,400	**4.04**	3.26	3.18	3.71	**4.81**	4.16	4.52
R$1,401 - R$2,300	**4.45**	3.68	3.67	3.97	4.29	4.29	4.51
R$2,301 - R$4,500	**4.53**	3.14	3.10	3.55	4.56	3.63	4.41
R$4,501 - R$6,000	**4.23**	3.54	3.36	3.66	4.44	4.00	4.70
R$6,001 - R$8,000	**4.38**	3.99	3.53	4.08	4.19	4.29	4.74
> R$8,001	**4.67**	**4.41**	**4.24**	**4.23**	**3.77**	**4.6**	**4.88**
Total	4.35	3.64	3.48	3.85	4.38	4.16	4.63

*Monthly Income
**Only the statistically relevant data - p<0.001

Questions 34, 35 and 36 in section D ask about how much more people would pay for certain products with ecological appeal, offering the answer options: a) None (0), b) 10% more, c) 20% more, d) 30% more, and e) 50% more. The products considered include organic fruits and vegetables, cosmetics made of natural products and natural cleaning products, which do not harm the environment. Respondents with incomes higher than R$8,001 would pay 30.17% more on average for organic fruits and vegetables, 27.85% more for cosmetics made with natural products and 21.16% more for natural cleaning products that do not harm the environment. In contrast, respondents with incomes up to R$1,400 would pay 9.31%, 9.96% and 7.06% more, respectively, for the products mentioned.

Results related to the area of the city and education were similar to income, probably due to the relationship among income vs. education vs. neighborhood, in which higher income inhabitants tend to live in upper class neighborhoods and have the opportunity to study more. Although there are these differences among the groups, it is important to highlight that residents of lower income and less education are willing to pay more for ecological products, even if in a small magnitude. As can be seen with more details in Table 8, this amount is 10.52%, 11.70% and 8.5% for lower income (organic fruits and vegetables, natural cosmetics and cleaning products, respectively). Women tend to pay more; they attempt to buy products with ecological appeal instead of traditional products.

Cosmetics received greater values than environmentally friendly natural foods or cleaning products, which raises the question of why consumers are willing to pay more for cosmetics than for food. One possible reason is the investment that some Brazilian companies perform in this sector in developing natural products and their significant focus on communicating the positive effects of these products on skin and hair. Essentially, it is possible that the marketing strategies of cosmetic companies, together with the emphasis on physical appearance in Brazil, can explain these results. In Brazil, the annual rate of growth in the personal care and cosmetics industry has been greater than 10% for the last 15 years. This development has made Brazil's market share the third largest in the world in this sector at 10.1%, with only the United States and Japan ahead of Brazil. If only Latin America is considered, Brazil has 53% of the market share, and it is believed that this figure will only increase in the coming years (ABIHPEC, 2013; COSMETICOSBR, 2013).

Given the selfish attitudes of consumers as mentioned by Schultz (2002), i.e., the focus on the self and on the effects of environmental problems on the self, it is understandable that individuals are less willing to pay for environmentally sound cleaning products. The effects of cleaning products have less to do with the user and more to do with the environment; the latter is the greater beneficiary of their use. The increased consumption of natural foods and natural cosmetics, in contrast, is more selfish, and Kollmuss and Agyeman (2002) consider this selfishness to motivate sustainable behavior because such behavior meets the personal needs of consumers.

Table 8 - Willingness to pay more for ecological products

How much more would you pay more for ...	Organic fruits and vegetables? (q34).		Cosmetics that are made of natural products? (q35).		Natural cleaning products? (q36).	
Income	**Mean**	**Sig.**	**Mean**	**Sig.**	**Mean**	**Sig.**
Less than R$1,400	**9.31**		**9.96**		**7.06**	
R$1,401 - R$2,300	11.67		13.21		10.42	
R$2,301 - R$4,500	16.41		18.26		17.07	
R$4,501 - R$6,000	21.18	<0.001	20.93	<0.001	19.32	<0.001
R$6,001 - R$8,000	23.40		22.36		18.12	
> R$8,001	**30.17**		**27.85**		**21.16**	
Total	18.23		18.30		15.15	
Neighborhoods	**Mean**	**Sig.**	**Sig.**	**Mean**	**Sig.**	
Upper Class	**23.57**		**21.71**		17.75	
Middle Class	20.57	<0.001	21.52	<0.001	**19.28**	<0.001
Lower Class	10.52		11.70		8.50	
Total	18.23		18.30		15.15	
Genre	**Mean**	**Sig.**	**Mean**	**Sig.**	**Mean**	**Sig.**
Men	15.67		14.61		12.90	
Women	**19.9**	<0.001	**20.70**	<0.001	**16.62**	<0.001
Total	18.23		18.30		15.15	
Education	**Mean**	**Sig.**	**Mean**	**Sig.**	**Mean**	**Sig.**
Less than Grade 9	7.16		7.79		5.37	
Grade 9	10.60		12.20		10.18	
Uncompleted High School	12.93		13.83		10.30	
Graduated High School	15.71	<0.001	16.39	<0.001	15.04	<0.001
Some college	23.02		23.15		**20.34**	
Undergraduate	**26.8**		**24.88**		**19.21**	
Total	18.23		18.30		15.15	

*Monthly Income

Sections E (habits) and F (disposal and recycling) included only a few questions that significantly differentiated the groups. With respect to habits, we should highlight the statement "I think it is normal to see someone washing the sidewalk with a hose." As income and education levels increased, the corresponding average for this question decreased. People with higher levels of income and education mostly reject this practice as inappropriate in Brazil, although many people do wash the fronts of their homes and buildings with potable water.

Analyzing section F (disposal and recycling) with respect to the effect of income indicates statistically significant differences. The income range from R$1,401 to R$2,300 provided the highest average scores. The respondents with incomes between R$1,401 to R$2,300 (5.33) or R$2,301 to R$4,500 (5.34) indicated the greatest willingness to decrease the amount of garbage in their homes. This may be because these respondents live in middle and lower income neighborhoods, where there is often more garbage on the street. However, generally speaking, few of the answers varied significantly with respect to gender, education or income.

Table 9 - ANOVA – Disposal and recycling

F – Questions about disposal and recycling	When I discard soda packaging, I remove its lid and its label to facilitate recycling.	I would like to reduce the amount of garbage produced in my house.	I do not always know where to drop off fluorescent bulbs, broken glass, batteries or electronic waste.	I sort waste properly when I am on the street or in collective spaces.	I always wash PET soda bottles before putting them in dry waste.	I think it is important to wash containers for recycling, removing food scraps.	When I dispose aluminum cans, I crush them to reduce their volume
Income	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
Less than R$1,400	**2.71**	**5.12**	5.01	**4.56**	**2.87**	**4.38**	**3.52**
R$1,401 - R$2,300	**2.73**	**5.33**	5.13	**4.9**	**3.02**	**4.82**	**3.99**
R$2,301 - R$4,500	**2.22**	**5.34**	4.74	**5.06**	**3.01**	**4.73**	**3.89**
R$4,501 - R$6,000	**2.28**	**5.03**	5.06	**5.08**	**2.66**	**4.59**	**3.61**
R$6,001 - R$8,000	**2.41**	**5.13**	5.05	**4.69**	**2.84**	**4.67**	**3.59**
> R$8,001	**2.21**	**4.86**	5.15	**4.53**	**2.44**	**4.98**	**3.00**
Total	**2.44**	**5.13**	5.02	**4.8**	**2.80**	**4.66**	**3.59**

*Monthly Income

We have seen that Porto Alegre's population is generally environmentally aware, with little differences across groups. Now, we must challenge people to change their habits and start to act with the same level of environmental consciousness that they say they have. In addition, the public authorities and the government must commit to provide better safety and infrastructure for the population, *e.g.*, better public transport and more cycling paths, increased safety and more education. The next section presents our final remarks.

6. Final Remarks

This study was conducted with 1200 residents from Porto Alegre (Brazil) to identify the relationship between citizens' attitudes and their environmental behavior. Among the main findings are the following.

The gap between the "attitude" and "behavior" of the respondents was confirmed. This gap was evident based on the high concordance (average of 5.47 on a scale of 1 to 6) of the participants' attitudes regarding the statement "I think that all attitudes are important in relation to the environment" in contrast to their disagreement (average of 2.8) regarding the statement "I always wash PET soda bottles before putting them in dry waste" or the statement " When I discard soda packaging, I remove its lid and its label to facilitate recycling " (average of 2.4).

These results show that when their "environmentally friendly" discourse is compared with their actual practices, the respondents exhibited a dichotomy between "attitude" (the perceived importance of action) and "behavior" (actual action). Engel, Blackwell and Miniard (2000) added two stages (consumption and disposal) to the traditional model of decision-

making at the time of purchase. The results obtained by including these stages in our questionnaire show that most respondents do not use an alternative and correct means of disposing of containers.

As stated above, economic growth in Brazil led to an increase of purchase power for consumers, with the inclusion of people from lower social and economic classes, that now have access to a higher consumption pattern, that is, products that go beyond their basic needs, such as electronics, cosmetics, etc. That is, a change in consumption and purchasing options (PETER; OLSON, 1999).

The neighborhoods where the respondents live, classified in terms of both income and education level, was identified as correlated with environmental behavior. Generally, higher income and education levels are more associated with pro-environmental behavior or the willingness to pay premium prices for products with ecological appeal. There are exceptions, however; the statement "I try not to use anything that is tested on animals" yielded higher results for the lower income groups. For most questions, the results were as expected; the respondents in the higher income brackets are more able to purchase these products. Additionally, people with higher levels of education have greater access to information, which makes them better able to behave in appropriate ways. Although, a positive attitude and willingness to change and pay more for environmental products, as scored by lower income respondents cannot be neglected.

In this sense, it seems that of the three components of attitude (i.e., cognitive, affective and conative, according to Engel, Blackwell and Miniard (2000), the cognitive component most positively affects environmental concerns because it depends on knowledge. The conative portion, which refers to action, is the most difficult to influence.

For most questions, there is no substantial difference in the responses with respect to income, education or gender. However, there is a significant difference between men and women in terms of their willingness to pay premium prices for products with ecological appeal.

Regarding the willingness to pay premium prices for products with environmental appeal, it should be noted that cosmetics received higher values than natural foods. As discussed in the results section, this phenomenon may be particular to Brazil because Brazil is the third largest consumer of cosmetics in the world and is less invested in the consumption of natural foods. In this case, the behavior of respondents, in addition to being selfish according

to the classification by Schultz (2002), shows a greater emphasis on vanity (the appearance of the skin and hair) than health (one's physical condition, which can be improved through the consumption of organic and other healthier products).

We can make several inferences regarding the importance of knowledge to promoting sustainable behavior. Kollmuss and Agyeman (2002) report that environmental knowledge is a subcategory of environmental awareness and that emotional involvement is what shapes attitudes and environmental awareness. Thus, greater involvement can transform selfish attitudes into altruistic or even biospheric attitudes according to Schultz (2002)'s framework. And indeed, this type of transformation of people's habits is fundamentally necessary. Another way to transform habits and improve of sustainability is to ensure media support; as seen from the results of this study, the media in Brazil have a substantial influence on the Brazilian people and have the ability to reinforce the positive cultural influence on society (ZABEL, 2005).

Jansson, Marell and Nordlund (2010) also cite the challenge of overcoming habits that forestall the adoption of sustainable behaviors. This challenge may explain the dichotomy between discourse and practice, which is common in people's approach to the environment and society. In this respect, we found some differences between social groups; however, the high average responses indicate a trend toward social acceptable answers.

These results confirm those of the study conducted by Nascimento *et al*. (2014), which indicated that consumers do not analyze products as part of a chain of consumption and disposal, i.e., that consumers lack a systemic view.

Although this paper brings relevant results in terms of traits and profile of citizens in relation to environmental concerns and behavior, questions related to the subject were self-reported and are embedded with social acceptability issues. In addition to this, it brings results from a specific context, and cannot be generalized to other cities with their own cultural, economic, political and administrative characteristics. Besides, this research was developed in 2011, and as any cross-sectional study, results could be different if conducted at another point in time.

Future studies might compare the results found in Porto Alegre with those found in cities in other regions or countries. A confirmatory qualitative analysis should also be conducted to verify the persistence of the dichotomy and to identify ways to improve the behavior of citizens.

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