Personality and Sustainable Consumption: an Application of the 3M Model

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ABSTRACT
The personality traits that predict sustainable consumption are investigated, adopting the 3M model as theoretical framework. Altruism seems to be a trait consistently useful to predict ecologically-correct purchase, resources saving, and recycling. Consumerism only seems to be useful to explain variance in resources saving.

INTRODUCTION
The increase of consumption in a global scale is a consequence of the extraordinary increase in the human population in the twentieth century, of the intensified urbanization and of the industrialization in most countries (Penna 1999). The obsession for economical growth and consumption is a reflection of the spreading of the development ideology, inherent to capitalism (Baudrillard 1998). The environmental problems resulting from that are acute and potentially catastrophically, for they tend to worsen. Deforestation, pollution, the destruction of ecosystems and biodiversity, global warming and others, are concrete activities that show the human influence on the planet.

It is necessary to raise people’s awareness about their negative impact on the environment and about the importance of their assuming an active role regarding nature conservation and quality of life in the long run, through the engagement in an ecologically responsible lifestyle and way of consuming.

Authors like Fraj and Martinez (2007) and Straughan and Roberts (1999) show some optimism when remembering that the general concern about human consumption as a sustainable factor has increased. Nevertheless, the spreading of ecological consciousness has been occurring in a slow rhythm, especially in countries of late industrialization. In Brazil, for example, only one in three consumers is worried about separating garbage for recycling, buying organic products and/or products made with recycled material, avoiding water and energy waste or to perform other types of ecologically conscious behaviors (Akatu 2006).

So, it is important to deepen the researches about sustainable consumption, aiming at the elaboration of educational programs and social intervention that make consumers in general, more sensitive to ecological issues.

When investigating the relation between personality traits and ecologically conscious consumption, this research adopts the 3M Model of Motivation and Personality (Mowen 2000) as theoretical frame, in order to identify effective ways to persuade people to consume with ecological responsibility.

In the next section, we will present a brief literature review about ecologically conscious consumption. Based on this review and on the consumer behavior concept, we come up with a sustainable consumption concept that is integrated to the theoretical framework and to the research hypothesis.

THEORETICAL BACKGROUND
Consumers have been aware of the need to buy in a socially responsible way and to demand from the companies adequate ecological behaviors. There was an increase in ecological awareness during the twentieth century and the changing of the environmental issue into an strategic priority to citizens, countries and organizations (Straughan & Roberts 1999). According to the authors, many companies have been trying to act in a more relevant way, doing more than just implementing processes of clean production, but engaging in ecological activities on behalf of sustainable development. In a more skeptical perspective, Peattie (2001) argues that the ecological engagement of the companies is a way of dealing with consumers that ask for a bigger responsibility towards nature conservation.

From the 1980’s on, because of a greater worry about the consumption impact on the environment, the concept of “green consumer” has been consolidated. Together with the emergence of this consumer segment, a “green market” expanded to a considerable rate in the developed countries (Schlegelmilch, Bohlen and Diamantopoulos 1996; Follows and Jobber 2000; Peattie 2001), since a reasonable part of the consumers were willing to pay more for goods which were made regarding a greater care for nature. For example, a survey made by Mintel, concluded that 27% of English adults were willing to pay 25% more for green products (Prothero 1990 apud Schlegelmilch, Bohlen and Diamantopoulos 1996), whereas a research made by J. Walter Thompson suggested that 82% of North-American would pay 5% more for this kind of product (Peattie, op. cit.). Furthermore, as a group, the green products gained a market share of 20% and, in specific categories, of 30% (Kohl 1990 apud Follows and Jobber 2000).

Nowadays, although there are still many challenges in order to develop a sustainable market, there are indications that it is potentially big and profitable (Mintu-Wimsatt and Bradford 1995; Tucker 1980 apud Wergin 2009). According to the company of marketing research called Mintel International Group, in 2006 the green market had a turnover of 200 billion dollars, and it is supposed to grow more in the future. There are also evidences that the consumers are becoming more inclined to have ecologically conscious behaviors: according to Ottman (1993), 70% of the North-American consumers declared that the fact that the products they bought were in recyclable packages affected their buying decisions, whereas in Brazil, 74% of the consumers stated their intention of buying products that do not degrade the environment (Mansur, Arini and Ferreira 2008).

Some investigations done during the 1970’s (Kassarjian 1971; Kimnour, Taylor, and Ahmed, 1974; Webster 1975) were already about identifying and analyzing the values, attitudes and behavior of ecologically conscious consumers, as well as explore means of reaching them more efficiently (Schaefer and Crane 2005).

Fraj and Martinez (2007) discuss three perspectives adopted along the years for the study of ecologically conscious consumers. Firstly, these researchers were interested in understanding the consumers behavior according to demographic and socio-economic measures (e.g., Vining and Ebrey, 1990, Bhat and Lawler, 1997, Daniere and Takahashi, 1999, Fraj et al., 1999, Fraj and Martinez, 2003). Later on, a new field of studies considered the amount of information and knowledge that people had regarding environmental problems and issues (e.g., Aronin and Ling, 1975, Ramsey and Rickson, 1976, Grunert and Kristensen, 1992). A third approach used psychographic variables, that included values, lifestyle, personality traits and attitudes (e.g., Batson et al., Granzine and Olsen, 1991, Ramanlah et al., 2000), to trace the profile of ecologically conscious consumers.

Although the marketing focus of ecologically conscious consumption is related to the trading of ecologically right products, that is, those with a minimum or none negative environment impact (Ottman 1993; Roberts 1996; Peattie 2001; Fraj and Martinez 2007), this research assumes that sustainable consumption (SC) must be
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widely understood. It must also include the search for a means of reducing the consumption of materials and energy, buying organic foods, buying goods that are produced in the local place, active participation in recycling, promoting the use of mass transportation and economy of resources (Halkier 1999 *apud* Connolly and Prothero 2008).

In fact, sustainable consumption must also be understood in the consumer behavior perspective, defined by Solomon (2002, p. 24) as “the study of the processes involved when individuals or groups select, buy, use or dispose products, services, ideas or experiences in order to satisfy necessities and desires”.

Based on this definition and on the review about ecologically conscious consumption, we propose to conceptualize sustainable consumption as: “the search for ecologically-correct products, the preference for corporations and organizations actively engaged in environment conservation, the using of materials and equipment up to the end of its service life, the saving of resources such as water and energy, the reusing, whenever possible, the right destination of materials to recycling and the propensity to a lifestyle with a smaller negative environment impact”.

The perspective adopted, aimed at complementing the previous studies, proposing a concept of sustainable consumption tied to the whole consumption cycle (acquisition, use and discharge) and coherent to the concern about saving the natural resources and support companies and institutions that are ecologically responsible. It is a way of consumption according to a less consumerist lifestyle, and, consequently, with a less negative environmental impact.

As in the long run, the objective of our research is to influence people so that they consume in a more sustainable way, we used the 3M model as framework, because identifying personality traits and associating them to sustainable consumption behavior, can set a base to elaborate messages that stimulate this behavior through the activation of these traits (Mowen and Harris 2003).

The 3M - a Meta-theoretical Model of Motivation and Personality

In this research, we employ the 3M Model that integrates control theory, evolutionary psychology principles, and elements of the hierarchical trait theories (Mowen 2000). This model provides a four-level structure to organize traits, based on an integrated account of how personality traits interact with situations to influence feelings, thoughts, and behaviors. The 3M Model has been employed as the theoretical model to investigate the trait antecedents of many types of behavior, including aggressive and distracted driving (Bone and Mowen 2006), credit card misuse among college students (Pirog III and Roberts 2007) and consumer competitiveness (Mowen 2004).

The 3M Model proposes that personality traits are arranged into a four-level hierarchy based upon their abstractness. Elemental traits are at the most abstract level and are enduring, cross-situational dispositions that arise from genetics and early learning history (Mowen 2000). The model proposes eight elemental traits, which should be included as control variables in the hierarchical model: openness to experience, conscientiousness, extraversion/introversion, agreeableness, emotional instability, need for body resources, need for material resources, and need for arousal. Based on works by Buss (1988) and Zuckerman (1979), Mowen suggested the addition of the last three elemental traits, extending the set of personality traits of the five-factor model (McCrae and Costa 1997). *Need for body resources* and *need for material resources* are traits strictly concerning self-preservation.

Compound traits are at the next level of the hierarchy. They are defined as cross-situational dispositions, that emerge from the interplay of elemental traits, culture, and the individual’s learning history (Mowen 2000). In the present study, we investigate two compound traits: general self-efficacy (Mowen 2000) and altruism (Stern 2000).

Compound traits were based on literature. Empirical results show that a belief in one’s own capacity of succeeding in performing tasks, irrespective of chance, influence the engagement in ecologically-oriented behaviors (e.g., Bodur and Sarığöllü 2005). But self-efficacy is a compound trait linked to personal control and has a crucial role in the performance of tasks (Mowen, 200). Besides, self-efficacy influences the performance of types of behavior which demand commitment and persistence to overcome difficulties (Bandura 1977 *apud* Mowen 2000). So, we propose general self-efficacy as antecedent of sustainable consumption.

Altruism can be understood as value or personality trait. There are many studies which found relationship among altruism, concern with environment, and ecologically-oriented behavior (e.g., Granzin and Olsen 1991; Dietz et al. 1998; Karp 1996; Stern and Dietz 1994; *apud* Stern 2000), if we understand altruism as a personal orientation which surpasses selfishness, individualism, competitiveness, and the predominant interest in the immediate social circles. In the present research, we conceptualize altruism as a compound trait and propose that it is also antecedent of sustainable consumption.

At the third level of hierarchy are situational traits, which result from combinations of elemental traits, compound traits, as well as the effects of situational environment (Mowen 2000). The situational trait investigated in this study is consumerism.

At the most concrete level in the hierarchy are superficial traits, which represent enduring dispositions to act within category-specific contexts (Mowen 2000). Superficial traits have a strong behavioral component. They result from the combined effects of elemental, compound, situational traits, and the press of the specific situational context. Based on the concept of sustainable consumption, we propose ecologically-oriented purchase, resources saving and recycling as superficial traits in this research. Figure 1 shows the hierarchical model employed in the present research.

**Figure 1. The research hierarchical model**

Situational and superficial traits were defined at the exploratory stage of the research by factor analyzing a 24-item scale of sustainable consumption (SC) as defined in the present research. Source of items were other scales, literature (e.g., a scale of consumerism was provided by De Young 2000) and personal judgment. By using principal component analysis and orthogonal rotation (varimax), we retained only 13 items to operationalize consumerism, ecologically-correct purchase, resources saving and recycling. We selected the non-ambiguous items which loaded more strongly on the respective factors. As a result, factor unidimensionality was reached. See table 1 for more information.
HYPOTHESES DEVELOPMENT
As recommend by Mowen (2000), all eight elemental traits were include in the research model as control variables. Proposed relationships among elemental traits and traits of other hierarchical levels are based on literature and logical analysis.

According to Borden and Francis (1978) people more concerned about environment tend to be more mature, responsible, sociable, and conscientious than the ones who are not concerned. Fraj and Martinez (2006) say that ecologically-correct consumers have higher scores in measures of extroversion (sociability), amiability and consciousness. Ramanaiah et al. (2000) found that the traits openness to experience and agreeability were more significant to distinguish consumer segments with high and low scores in environmental responsibility. Monteiro et al. (2008) observe that people who are more agreeable, creative and conscientious are more likely to strive for a balance between nature and modern life. As ecologically-correct purchase, resources saving and recycling are traits which show care for the environment, the following hypotheses were proposed:

Hypothesis 1a: Conscientiousness is positively related with ecologically-correct purchase.
Hypothesis 1b: Conscientiousness is positively related with resources saving.
Hypothesis 1c: Conscientiousness is positively related with recycling.
Hypothesis 2a: Openness to experience is positively related with ecologically-correct purchase.
Hypothesis 2b: Openness to experience is positively related with resources saving.
Hypothesis 2c: Openness to experience is positively related with recycling.
Hypothesis 3a: Agreeability is positively related with ecologically-correct purchase.
Hypothesis 3b: Agreeability is positively related with resources saving.
Hypothesis 3c: Agreeability is positively related with recycling.
Hypothesis 4a: Extroversion is positively related with ecologically-correct purchase.
Hypothesis 4b: Extroversion is positively related with resources saving.
Hypothesis 4c: Extroversion is positively related with recycling.

As in the long run sustainable consumption is oriented towards saving natural resources and protecting the environment in order to guarantee survival, we predicted the following relationships:

Table 1
Situational and Superficial Traits Resulted of Exploratory Analysis

<table>
<thead>
<tr>
<th>Factor</th>
<th>Variable</th>
<th>Item-total correlation</th>
<th>Item description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumerism (*)</td>
<td>Cronbach’s alpha = .62</td>
<td>.42</td>
<td>I wear clothes that are in fashion.</td>
</tr>
<tr>
<td>All = .35</td>
<td>i6</td>
<td>.43</td>
<td>I have the most modern electronic gadgets and consumer goods.</td>
</tr>
<tr>
<td>i17</td>
<td>.44</td>
<td>I have luxury items and conveniences available in our society.</td>
<td></td>
</tr>
<tr>
<td>Ecologically-correct purchase (**)</td>
<td>Cronbach’s alpha = .75</td>
<td>.48</td>
<td>I vote for politicians who support the environmental causes.</td>
</tr>
<tr>
<td>All = .50</td>
<td>i4</td>
<td>.58</td>
<td>I stop buying from companies which doesn’t show concern for the protection of the environment.</td>
</tr>
<tr>
<td>i12</td>
<td>.66</td>
<td>I change my brand preferences to support companies that show more concern for the protection of environment.</td>
<td></td>
</tr>
<tr>
<td>Resources saving (**)</td>
<td>Cronbach’s alpha = .62</td>
<td>.29</td>
<td>I turn off the taps when soaping or washing dishes.</td>
</tr>
<tr>
<td>All = .35</td>
<td>i21</td>
<td>.51</td>
<td>I let lights on without need.</td>
</tr>
<tr>
<td>Recycling (**)</td>
<td>Cronbach’s alpha = .94</td>
<td>.86</td>
<td>I separate metal objects (e.g. cans) for recycling.</td>
</tr>
<tr>
<td>All = .80</td>
<td>i2</td>
<td>.91</td>
<td>I separate glass (e.g. beer bottles) for recycling.</td>
</tr>
<tr>
<td>i11</td>
<td>.80</td>
<td>I separate paper for recycling.</td>
<td></td>
</tr>
<tr>
<td>i20</td>
<td>.89</td>
<td>I separate plastic packaging (e.g. plastic bottles, plastic bags etc.) for recycling.</td>
<td></td>
</tr>
<tr>
<td>i23</td>
<td>Notes: AII – Average inter-item correlations; (*) situational trait; (**) superficial trait.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hypothesis 5a: The need for body resources is positively related with ecologically-correct purchase.

Hypothesis 5b: The need for body resources is positively related with resources saving.

Hypothesis 5c: The need for body resources is positively related with recycling.

Hypothesis 6a: Altruism is positively related with ecologically-correct purchase.

Hypothesis 6b: Altruism is positively related with resources saving.

Hypothesis 6c: Altruism is positively related with recycling.

Hypothesis 6d: Altruism is negatively related with consumerism.

As Straughan and Roberts (1999) state that altruism and self-efficacy seem to be personality traits typical of ecologically-correct consumers, we proposed the following hypothesis about compound traits:

Hypothesis 7a: General self-efficacy is positively related with consumerism.

Hypothesis 7b: General self-efficacy is positively related with resources saving.

Hypothesis 7c: General self-efficacy is positively related with ecologically-correct purchase.

Hypothesis 7d: General self-efficacy is positively related with recycling.

Finally, some hypotheses concerned relationships among compound and elemental traits. According to meta-analysis, Mowen (2000) concluded that with the exception of the need for material resources trait, all elemental traits were significant predictors of general self-efficacy. In the case of altruism, we decided to test correlation with all eight elemental traits.

Hypothesis 8a: Openness to experience is positively related with consumerism.

Hypothesis 8b: The need for arousal is positively related with consumerism.

Hypothesis 8c: The need for body resources is positively related with consumerism.

Hypothesis 8d: The need for material resources is positively related with consumerism.

Consumerism can be understood as the search for conveniences of modern society and continuous interest in new or innovative products (De Young 2000). We assume that four elemental traits are related with consumerism:

Hypothesis 9a: Consumerism is negatively related with openness to experience.

Hypothesis 9b: Consumerism is negatively related with the need for arousal.

Hypothesis 9c: Consumerism is negatively related with the need for body resources.

Hypothesis 9d: Consumerism is negatively related with the need for material resources.

As Straughan and Roberts (1999) state that altruism and self-efficacy seem to be personality traits typical of ecologically-correct consumers, we proposed the following hypothesis about compound traits:

Hypothesis 10: General self-efficacy is related with all the eight elemental traits.

Hypothesis 11: Altruism is related with all the eight elemental traits.

METHOD

College students of different undergraduate courses of the same university were surveyed. We obtained 512 valid questionnaires over a 2 week-time period. The mean age was 22.8 years, and 50.1 per cent were women. The four-page survey contained measures of the traits under investigation and also demographic measures. Consistent with prior research on the 3M Model, the survey was arranged such that respondents answered items in their order in the hierarchical model, starting by responding to the elemental traits items. Elemental traits items were taken from Monteiro et al. (2008). Compound traits (general self-efficacy and altruism) were respectively taken from Mowen (2000) and Schultz (2000). De Young (2000) provided items to measure consumerism, and the other sustainable consumption items were also taken from literature and personal judgment. Five-point scales were used for all variables.

Exploratory data analysis was carried out by employing SPSS version 17. The problem of missing data was almost negligible as only 0.2% of item data were missing. Their distribution was considered as completely at random (MCAR Little’s test: chi-square = 197.976, d.f. = 207, p = .662). So, multiple data imputation was adopted to get a complete data set. Variables did not exhibit univariate normality, according to Kolmogorov-Smirnov tests.

The sample was randomly split in two subsamples. The biggest one (n = 312) was used to operationalize the constructs associated to sustainable consumption (consumerism, ecologically-correct purchase, resources saving and recycling), and to select single items to represent the elemental traits and the best indicators of compound traits (altruism and general self-efficacy). The smallest subsample (n = 200) was used to estimate the research hierarchical model.
Table 2
Accounted Variances and Significant Effects in the Full Hierarchical Model

<table>
<thead>
<tr>
<th>Trait</th>
<th>Accounted Variance</th>
<th>Non-sig. Predictor</th>
<th>Significant Predictor</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altruism (Alt.)</td>
<td>39%</td>
<td>Agreeability</td>
<td></td>
<td>3.85</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Openness</td>
<td></td>
<td>1.77</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conscienc.</td>
<td></td>
<td>2.54</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material.</td>
<td></td>
<td>-2.73</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Body res.</td>
<td></td>
<td>2.77</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instability</td>
<td></td>
<td>-2.24</td>
<td>0.03</td>
</tr>
<tr>
<td>Arousal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extroversion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General self-efficacy</td>
<td>18%</td>
<td>Agreeability</td>
<td></td>
<td>2.84</td>
<td>0.01</td>
</tr>
<tr>
<td>(GSE)</td>
<td></td>
<td>Openness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conscienc.</td>
<td></td>
<td>3.25</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Body res.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Instability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumerism (Consum.)</td>
<td>43%</td>
<td>Alt.</td>
<td></td>
<td>-2.08</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Openness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material.</td>
<td></td>
<td>5.21</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Body res.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecologically-correct</td>
<td>38%</td>
<td>Agreeability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>purchase (ECP)</td>
<td></td>
<td>Alt.</td>
<td></td>
<td>4.12</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GSE</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Openness</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Conscienc.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Consum.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Body res.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources saving (RS)</td>
<td>26%</td>
<td>Agreeability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alt.</td>
<td></td>
<td>1.96</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GSE</td>
<td></td>
<td>2.06</td>
<td>0.04</td>
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<tr>
<td></td>
<td></td>
<td>Openness</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Conscienc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consum.</td>
<td></td>
<td>-2.32</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Body res.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recycling (Recyc.)</td>
<td>16%</td>
<td>Agreeability</td>
<td></td>
<td>-2.15</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alt.</td>
<td></td>
<td>2.82</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GSE</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Openness</td>
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<td>Conscienc.</td>
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<tr>
<td></td>
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<td>Consum.</td>
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<td>Body res.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Extroversion</td>
<td></td>
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</tbody>
</table>
RESULTS
First of all, the measurement model was assessed. All traits were included. In the case of elemental traits, only a single item represented each trait. Although chi-square is significant, RMSEA and the incremental fit statistics were satisfactory in general ($\chi^2 = 304.3, df = 241, p < 0.01, \chi^2 / df = 1.3$, CFI = 0.96, TLI = 0.94, NFI = 0.84, RMSEA = 0.036). Composite reliability were all at least 0.65, except for altruism (CR = 0.57). Additionally, coefficient alphas for all constructs were all above 0.60, except for altruism ($\alpha = 0.59$). Bivariate correlations among constructs were not above 0.60, so discriminant validity was assumed.

A full mediation model was employed in order to assess the predicted hypotheses. The fit statistics of this model were satisfactory ($\chi^2 = 330.6, df = 259, p < 0.01, \chi^2 / df = 1.3$, CFI = 0.96, TLI = 0.94, NFI = 0.83, RMSEA = 0.037). Accounted variance and significant effects are shown on Table 2.

Altruism, whose accounted variance is 39%, is significantly predicted by six elemental traits (except for need for arousal and extraversion), whereas only three of the seven hypothesized elemental traits were significant predictors of general self-efficacy (accounted variance = 18%). As expected, altruism is a significant predictor of ecologically-correct purchase, resources saving, and recycling. Also, the hypothesis of a negative association effect of altruism on consumerism is supported. General self-efficacy predicts significantly resources saving. But, contrary to expected, neither ecologically-correct purchase nor recycling is significantly predicted by self-efficacy. Accounted variance in consumerism is 43%, and this construct has a negative effect on resources saving, and is significantly predicted by need for material resources, an elemental trait. But no significant effects were detected between consumerism and the other two superficial traits.

Accounted variance in ecologically-correct purchase is 38%, but only altruism is a significant predictor of this superficial trait. No elemental trait is a significant predictor of resources saving. But, as expected, altruism and general self-efficacy are significant predictors of resources saving. The model accounted for 26% of the variance in resources saving. Of the superficial traits, only recycling is significantly predicted by one of the elemental traits hypothesized (agreeability). Recycling, whose accounted variance is only 16%, is also predicted by altruism, as mentioned before.

DISCUSSION, IMPLICATIONS AND FUTURE RESEARCH
Our research aimed to investigate the traits antecedents of sustainable consumption, operationalized as three superficial traits: ecologically-correct purchase, resources saving, and recycling. Based on the literature review, we proposed that sustainable consumption is negatively related with consumerism, and positively related with general self-efficacy and altruism. We also predicted associations of theses constructs with elemental traits.

Corroborating the point of view of Straughan and Roberts (1999), altruism, a compound trait, seems to be a trait consistently useful to predict sustainable consumption, because it is a significant predictor of ecologically-correct purchase, resources saving, and recycling. Consumerism only seems to be useful to explain variance in resources saving. Besides altruism, agreeability (an elemental trait) is a significant predictor of recycling. Resources saving has self-efficacy as a significant predictor, besides altruism and consumerism.

In the present research, taken into account the mediating effect of consumerism, self-efficacy and altruism, no elemental trait, with the exception of agreeability, seems to have a significant direct effect on constructs associated to sustainable consumption. (In fact, no substantial increase in accounted variance of superficial traits was obtained in a partial mediation model in which paths were run from all the elemental traits to consumerism, ecologically-correct purchase, resources saving, and recycling.)

Nevertheless, six elemental traits are significant predictors of altruism: agreeableness ($t = 3.75, p < 0.001$), openness to experience ($t = 1.77, p < 0.10$), conscientiousness ($t = 2.54, p < 0.05$), need for material resources ($t = -2.73, p < 0.05$), need for body resources ($t = 2.77, p < 0.05$), and emotional instability ($t = -2.24, p < 0.05$).

In order to enhance sustainable consumption, altruism should be encouraged. Surprisingly, altruism seems to be predicted not only by traits associated to agreeableness, but also by traits concerning self preservation. So, persuasive communication aimed to promote sustainable consumption could strengthen the importance of preserving the environment and natural resources as a means of collective survival. On the other hand, reduction of consumerism could be associated to a natural tendency to save natural resources if we succeed in discouraging materialism.

Future research should deepen the investigation of the relationship between personality and sustainable consumption. Scales of sustained consumption should be improved. Other traits, such as value consciousness, could be included in the research hierarchical model. A panel of consumers could be surveyed in order to get data from people more representative of the population in general. The inclusion of demographic variables would also be useful to assess their relevance as predictors of sustainable consumption.

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